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ORIGINAL INVESTIGATION

"Let's go for a walk!": identification and prioritisation of accessibility and safety measures involving elderly people in a residential area

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Abstract By emphasising the involvement of elderly people in a project applying a mixed-method approach, the overriding objective of this study was to identify and prioritise concrete measures aimed at increasing accessibility and safety in the outdoor pedestrian environment within a residential area of a Swedish town. Measures generally given priority were: the separation of pedestrians/cyclists, lower speed limits, better maintenance and specific measures in pedestrian walkways such as wider sidewalks, curb levels and form and more even surfaces on pavements. Definition of these priorities offered knowledge to the highway department concerning the importance of small details in relation to the larger infrastructure. The elderly people in the study district found new ways to communicate with and influence those within the community who are responsible for these matters.

Keywords Outdoor environment · Pedestrians · Urban planning · Participation · Community · Mobility

Introduction

As mobility is a fundamental aspect among the activities of daily living, preserving mobility and participation in the society in old age is a critical part of maintaining function and prevention of further disability (Mollenkopf et al. 2004; Shootman et al. 2007; Shumway-Cook et al. 2002). However, elderly people often experience accessibility problems in outdoor environments (Carlsson 2004; Shumway-Cook et al. 2002; Valdemarsson et al. 2005), these problems are closely linked with safety issues, since pedestrian falls are often caused by barriers in the environment (Ståhl and Berntman 2007). Thus, well-designed outdoor environments and public transport systems are important prerequisites for elderly people to be able to travel and conduct their everyday activities independently and safely (Leslie et al. 2005; Ståhl 1996). In spite of the significance of the outdoor environment to elderly people, relatively little research has been conducted in this field (Sugiyama and Ward Thompson 2007).

Investment in improved design of physical outdoor environments should enhance the possibility for elderly people to live independently, considering that the outdoor environment that can offer support for activity and participation can also support health and quality of life (Banister and Bowling 2004; Gabriel and Bowling 2004; Schootman et al. 2007; Sugiyama and Ward Thompson 2007). Furthermore, since walking in itself is a protection against unhealthy outcomes (Hallal et al. 2005; Owen et al. 2004), environmental improvements may be effective for health promotion in general (King et al. 2005; Suminiski et al. 2005). Based on years of research, there is now a stable knowledge base on the types of environmental barriers that cause accessibility problems and safety risks for elderly people in the outdoor environment (Berntman 2003; Lavery et al. 1996). However, the current processes for the implementation of concrete measures to reduce environmental barriers does not appear to have given any useful results. Therefore, it is urgent to develop more efficient processes for urban planning at local community level that strive to

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develop environments that support elderly people's outdoor mobility. To achieve a supportive environment requires proper planning and design, backed up by scientifically based evidence obtained from empirical research (Sugiyama and Ward Thompson 2007).

Elderly people, in their capacity as users and consumers with the right to express their opinions (Carter and Beresford 2000) make them interesting and useful partners for research leading to efficient implementation of resources. When summing up the literature search performed for the current study, it shows that most research based on the involvement of elderly people has been conducted in the context of health care (Fudge et al. 2007). In fact, searching through the latest five-year period we found very few peer-reviewed studies reporting involvement by elderly people in research on outdoor environment improvement (Minkler et al. 2006). According to Fudge et al. (2007), user involvement leads to research of greater relevance to people and the findings are more likely to be implemented. Not the least, such research might foster empowerment of the public.

Thus, in order to come up with research results that ultimately result in demonstrating how supportive environments can be efficiently developed, the current study targeted improvements to outdoor pedestrian environments based on the problems identified by elderly people. The aim of the study was to identify and prioritise concrete measures that were possible to implement in order to gain increased accessibility and safety in the outdoor environment in a residential area, by means of involving elderly people in a co-operative planning process.

Methods

For this project, a mixed-method approach (Creswell and Plano Clark 2007) was chosen, emphasising involvement of people aged 65 years or more. The project also involved representatives from regional authorities, municipal political groups and administrations, landlords, and tenant associations, i.e. public actors and stakeholders engaged in the physical planning of outdoor environments. The Ethics Committee at Lund University approved the study.

Based on Reed et al.'s (2004) definition of a continuum of user involvement in research, in the current study we strived to involve elderly people not only as sources of data but also as partners. According to Reed et al.'s model, it is important to ask users about their opinions by the means of, e.g. questionnaires, i.e. engaging them as data sources. Moving further along the continuum to involve users as research partners implies that elderly people are engaged in data collection, data analyses, etc. In designing the current project, we strived to create authentic opportunities for user involvement achieved within the framework of a research project (Ross et al. 2005).

Turning to the overall methodological approach, in order to effectuate the involvement of elderly people as well as other actors and stakeholders along the continuum described above, it was necessary to use different methods. Applying a mixed-methods approach to research design, in order to deepen our understanding of the problems under study, we combined quantitative and qualitative approaches. To obtain different but complementary data on the same topic, we adopted the triangulation design, rendering comparison of findings as well as validation of results possible (Creswell and Plano Clark 2007). The intent, by using this kind of design, is to bring together the different strengths and non-overlapping weaknesses of quantitative methods with those of qualitative methods (Patton 2002).

Study district

The key criterion for the choice of the target municipality was the local authorities' commitment to invest money for concrete outdoor environment improvements. The municipality chosen is a typical medium-sized town in Southern Sweden. It was chosen based on its population and housing types, distances to key destinations in the town centre, and availability of public transportation. The geographically defined area in the study was close to the town centre and consisted of three connected housing districts with single-family houses and apartment blocks built during the twentieth century. Approximately 3,000 persons lived in the district; 20% were aged 65+. Several industries that generated heavy traffic were located in the district. The street system was varied, with some streets designed for through traffic and some intersections regulated by traffic lights. Other streets were narrower and lacked designated pedestrian crossings. Pedestrian path surface materials were mixed and the authorities noted that they considered the maintenance of paths and sidewalks as demanding. The area was serviced by one bus route that continued to the town centre.

Project design

This project took place over a 4-year period, i.e. 2002–2006. This study reports on the period of problem identification and measure prioritisation. While not reported on in the current study, an implementation plan was developed later, which was followed by concrete environmental improvements in the study district.

To stress the importance of user involvement as well as the engagement of actors in the societal planning process from the very start and throughout the entire project period, special emphasis was laid on communication activities.

Early on, the project was presented to potential actors, including all the inhabitants in the study district, using channels such as mailed leaflets and postcards, local media presentations, public information meetings and demonstration seminars. During the first meetings and in the first information material distributed in the study district, the sub-studies that were planned were presented to the elderly inhabitants in order to lay the ground for a high response rate and user involvement in the forthcoming project activities. During the process, the research team had frequent meetings with the representatives of the local and regional authorities.

Problem identification and prioritisation of measures for implementation

In order to strengthen the study design and increase the validity and credibility of the findings, triangulation (Creswell and Plano Clark 2007; Patton 2002) was applied. That is, three sub-studies applying different methodologies were made, rendering cross-validation of the findings possible. In order to arrive at a more complete picture of the problems under study, qualitative data (sub-studies 2 and 3) were embedded (Creswell and Plano Clark 2007) within a quantitative dataset (sub-study 1). To arrive at the prioritisation of measures constituting the aim of this study, the embedded data (sub-studies 2 and 3) were collected sequentially after the quantitative data (sub-study 1).

Sub-study 1: postal questionnaire survey

Based on previous research (Lavery et al. 1996; Leslie 2005; Ståhl 1987) the research team developed a semi-structured postal questionnaire. The questionnaire was developed over a period of 4 months in order to arrive at an instrument fulfilling basic face and content validity requirements; it involved the project actors in an iterative revision process. In order to strengthen the validity and reliability of the postal questionnaire, this process included testing it on three elderly persons who were not part of the study sample.

The postal questionnaire was designed to chart the travel habits, away-from-home activities, and residential situations of elderly inhabitants in the study district, and to identify accessibility and safety problems in the outdoor environment, specifically along pedestrian walkways. In order to engage the respondents more actively than is commonly the case in postal questionnaires and to focus their attention to the actual situation in their close neighbourhood, they were first of all asked to specify the most important destinations for their travels. In this context, they were asked to give concrete descriptions of which specific areas/passages they perceived as being inaccessible and/or unsafe, including identification of exact locations for their perceived problems along common itineraries. Another way to nurture active respondent involvement for the project was to ask them for their proposals for eliminating the problems they reported. A more traditional part of the questionnaire covered basic demographics as well as aspects of health [self-reporting of functional limitations according to Iwarsson and Slaug (2001); global questions on perceived health, according to Tibblin et al. (1990)]. Finally, the respondents were asked to indicate if they were willing to participate in further sub-studies within the project. The postal questionnaire comprised of 47 structured and 5 open-ended questions.

Along with an information letter, all persons aged 65+ registered as living permanently within the study district ($N = 556$) received the postal questionnaire, followed by a reminder three weeks later. In all, 338 persons (61%) responded. The mean age was 76 (age range 65–93 years); 38% men and 62% women. A good half (53%) were cohabiting, and the vast majority (89%) lived in blocks of flats. Many respondents had lived in the district all their lives (mean 24 years) and their attachment to the area was strong; only nine persons expressed a desire to relocate. Close to two-thirds (59%) reported some functional limitation and 15% reported difficulty in walking distances >200 m. In the sample 4% used wheelchairs and 14% used rollators [i.e. the Nordic type of wheeled walkers, see Brandt et al. (2003)]. The response rates were 80% in the group aged 65–74 years, 60% among those aged 75–84 years, and 35% among those aged 85+. Besides declined participation without giving any reason, health problems was the most common reason for dropout.

Sub-study 2: participant observations

Sub-study 2 aimed at registering environmental barriers and risk factors along the pedestrian walkways to important destinations close to the study district as selected by each participant. The participants were recruited among those responding positively to further project involvement in the postal questionnaire, $N = 150$ (44%), registered in a database. The inclusion criteria were that the participant could report of one or more functional limitations, and concrete problems they perceived in the outdoor environment within the study district. In order to recruit participants with experience of the central phenomena under study (Creswell and Plano Clark 2007), a purposeful sample was defined, aiming for maximum variation (Patton 2002) according to sex, age group, and housing type. One of the researchers contacted ten potential participants by phone and asked for their informed consent to participate.

The data collection methodology applied reflected subjective as well as objective perspectives of elderly people's

interaction with the physical environment (Jensen et al. 2002). During a home visit, each participant was asked to tell about places in the area they considered to be important to visit, and to select one of them as the destination for a walk together with a researcher. To validate the functional limitations reported in the postal questionnaire an assessment of the participant's functional limitations was made (Iwarsson and Slaug 2001).

The observed walk was defined as the entire way from the entrance to the participant's home to the chosen destination and back again (Jensen et al. 2002). In order to capture subjective aspects of environmental barriers and risk factors in the outdoor environment the critical incident technique (Flanagan 1954) was used for participant observation (Patton 2002). Following the procedure described by Jensen et al. (2002), accompanied by a researcher, the participant walked to the destination and back again. During the walk, the participant reported what they experienced as problems in the environment while applying the critical incident technique (Flanagan 1954), also the researcher observed and registered the problems encountered by the participant. The data was recorded using a study-specific format, categorising different types of critical incidents according to pre-defined definitions (Jensen et al. 2002). In addition, the researcher recorded the exact route followed.

A short time after the first observed walk and in order to register environmental barriers and risk factors in the outdoor environment from an objective perspective, another researcher independently went the same route as the participants had. An objective mapping of environmental barriers was made, implying a professional, objective evaluation of the pedestrian walkways in accordance with the methodology developed by Iwarsson et al. (2000), based on the Enabler Concept (Steinfeld et al. 1979). Assessments and measurements concerned design features such as the width of walkways, slopes, unevenness in the walkway surfaces, and number of and distances between places to sit down.

Sub-study 3: research circles and synthesis of results

Sub-study 3 aimed at creating a programme for concrete improvements in the outdoor environment within the study district. The sample for sub-study 3 was stratified to include participants representing different actors in the project process as well as elderly inhabitants and included 16 persons. The inclusion criteria for the elderly inhabitants ($N = 8$) were the same as for sub-study 2, with the additional criterion that they had also proposed problem solutions in their answers to the postal questionnaire. Actors in the project process ($N = 8$) were chosen based on personal engagement and interest for the project, purposefully selected (Patton 2002) to represent the different authorities involved [the Swedish Highways Administration (SRA), health care services, the public services administration (PSA), politicians, the public transportation authority, tenant associations, landlords]. In the research circles, during most of the time, the participants worked as one group, while in the final phase of analysis (described below), the two strata groups partly worked independently.

The method chosen was a practice-oriented, structured method developed by researchers at Lund University, Sweden (Härnsten 1994). Based on the Swedish tradition of so-called "study circles", well-known in Sweden and an integrated part of public, voluntary education since decades, research circles were developed as a means to engage practitioners and researchers in a joint effort to develop or collect knowledge that has not previously been recognised. Research circles should be led by researchers, but must involve participants with different backgrounds. Research circles aim to nurture engagement and communication among people with different perspectives but with core interests in common, ultimately resulting in joint agreements for practical actions to influence and change their own situation. In the current project, the research circles were headed by two senior researchers from architecture and traffic planning, respectively. In addition they were assisted by researchers with a background in occupational therapy and gerontology. In all, five meetings were held, each lasting for 2.5–3.0 h (Table 1). All meetings were held at facilities within the study district; meetings 1–2 at a conference centre, meetings 3–5 in a conference room in a block of flats. With only a few exceptions, all of the participants were present on every occasion. Between meetings, the participants had homework assignments. Examples of such assignments were to define what barriers they had perceived in their close neighbourhood and what improvements they believed would eliminate the defined barriers and risks.

The research circle approach presupposed that the group of people engaged discussed and analysed accessibility and safety problems in the outdoor environment within the study district. The discussions set out from the overreaching question "What is required for elderly people to be able to continue living in their residential area?" In advance, a theme was decided upon for each research circle meeting (Table 1). The role of the researchers was to lead the discussion and keep it on track, while not taking command but keeping up an open atmosphere. Special attention was paid to giving all participants the opportunity to contribute with their experiences and to participate with equal authority. Each session was documented by detailed notes taken by one of the research circle leaders, as well as by formal minutes taken by the participant representing the SRA.

Table 1 Sub-study 3: themes of the five research circle meetings

Meeting no.	Theme and content
1	My expectations and what can i contribute to the research circle?
2	What is required to allow elderly people to go on living within the area?
	Presentation of the results of the postal questionnaire and local accident statistics
3	Discussion with invited guests
	The city architect and a representative of "The Bicycle Group"
	Presentation of results from the participant observations
4	What are the most important problems and obstacles in our neighbourhood that require attention?
	Discussion with people from involved authorities
5	Joint prioritisation of the measures to be included in the improvement programme

The results from the postal questionnaire and the participant observations were synthesised with the results emerging during the research circle discussions. That is, following the basic principles of embedding one dataset with the others (Creswell and Plano Clark 2007), this phase constituted an analysis of the results from all three sub-studies, aiming at taking the identification and prioritisation of measures one step further towards the development of a programme of concrete measures within the outdoor environment of the study district. The research circle context was utilised to strengthen the involvement of the elderly inhabitants as well as the other actors in the project process in this step of final analysis. While resting heavily on the active involvement from the research circle participants, it should be emphasised that the analysis process was closely monitored by the two researchers (A. Ståhl and O. Åhlund) who supervised the research circles. In addition, another senior researcher (SI) was present during some of the research circle sessions, taking an active part in the discussions. The researchers who had been involved in the data collection for sub-studies 1 and 2 (GC, PH) were invited to present their preliminary results. In addition, in order to deepen the information base underlying the discussions, guests from the municipality and the SRA were invited (Table 1). During the later research circle meetings a participant feed back check was made, i.e. the researchers took the summaries of the findings back to the participants and asked them whether the findings were an accurate reflection of their experiences (Creswell and Plano Clark 2007). In order to further establish validity and trustworthiness, the four authors engaged in an iterative process leading up to the final presentation of the findings as they appear in this paper.

The starting point for the prioritisation of concrete measures was the fourth meeting of the research circle (Table 1) and constituted the base for the implementation plan to be developed later on. The research circle participants were asked to make an initial overall systematisation of the improvements discussed. Municipality and SRA representatives listened to proposals, reflections and ideas that came up, resulting in the definition of two kinds of approaches to the planned intervention; one involving traffic technology and the other focusing on design and maintenance measures for pedestrian walkways. Next, each of the two strata of research circle participants (elderly people and actors) independently discussed prioritisation strategies for the measures discussed. Each of the strata groups came up with three strategies, and in the next round of discussions the research circle participants reached consensus on which of the proposed improvements could be accommodated in each strata group's primary strategy. Finally, the material gathered from the research circle was collated with the proposals elicited from the postal questionnaire and the participant observations with regard to the types of environmental barriers and risk factors reported where they were located and the kind of improvement suggested. Thereafter, the municipality officials worked out a proposal for an improvement programme. This programme described the order of priority in which the municipality could carry out the measures, along with a time plan. The improvement programme was then finally discussed during meeting number 5 and soon thereafter, the governing body of the municipality approved it.

Results

Nearly all postal questionnaire respondents (97%) stated that they had made trips within the town; almost half on a daily basis. However, nearly one-fourth (23%) said that they did not participate in various activities as much as they would like to. One-fifth (21%) thought that it was difficult to get around within the study district, as a pedestrian, and 10% said that they were not able to be outdoors as much as they would like.

Identification of environmental barriers in the outdoor environment

The postal questionnaire revealed the different kinds of environmental barriers and risk factors elderly persons in the study district were confronted with (Fig. 1). The barrier/risk factor reported most often was poor snow clearance and insufficient prevention of slippery pedestrian walkways, which was attested to by 65% of the respondents. Bicycles and mopeds ridden on shared pedestrian and bicycle pathways and on sidewalks represented another type of problem and were reported by 50 and 23%,

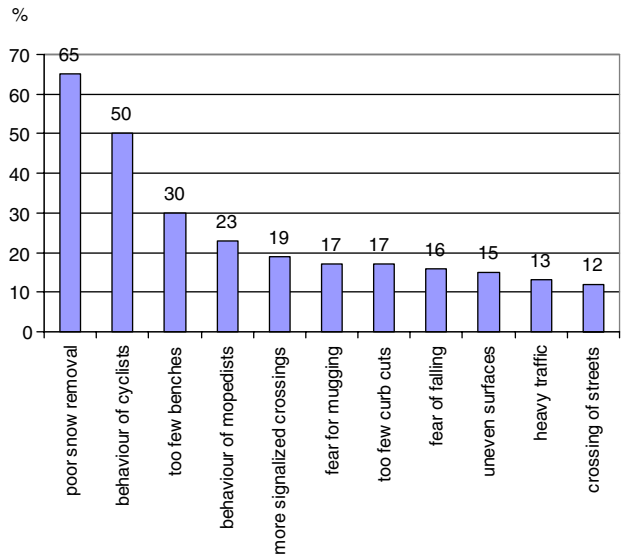

Fig. 1 Environmental barriers and risk factors reported in the postal questionnaire, $N = 338$

respectively. For one-third (30%), the lack of benches was an important barrier that prevented them from moving around within the study district. The need to be able to sit down and rest was manifest; 15% of the respondents stated that it was difficult for them to walk more than 200 m without resting. The importance of benches in the outdoor environment was validated by the participant observations. The participants expressed a great desire to be able to go for a walk within the study district and to walk to the town centre, but there were too few benches, and the distances between those that existed were too long. Several examples of existing benches that were considered impossible to use (due to design and/or location) were documented.

Among the postal questionnaire respondents, 13% stated that traffic was a problem within the study district, and 19% wanted more traffic signals at pedestrian crossings. For the pedestrian walkways, 15% defined high curbs, holes or sudden depressions in the walking surfaces on pathways/sidewalks, as well as uneven, narrow sidewalks with severe inclines, to be barriers. Such barriers were validated by the participant observations when participants were forced to walk out into the street because of parked cars or pools of water. Other difficulties involved unclear indications of pedestrian crossings, lack of curb cuts, and uneven and generally poorly maintained walking surfaces. Further, the questionnaire respondents reported problems associated with specific pedestrian walkways, such as where bicycles/mopeds mixed with pedestrians, lack of places to sit, poorly maintained sidewalks, pedestrian crossings that they perceived as un-safe, and the long distances to bus stops. The research circle looked deeper into the shortcomings and obstacles, i.e. those that had appeared in the earlier sub-studies were additionally concretised, and locations perceived as particularly difficult were discussed in detail.

Measures to improve the situation for older people in the study district

In the final phase of the research circle activities the wishes of the elderly related to improvements in the outdoor environment were made into concrete plans ensuring better walking conditions within the study district, which would offer the proper conditions for the elderly to be physically active, and thereby improving their psychological and social conditions. The older inhabitants taking part in the research circles also wished that the residential area should be made more walking friendly, with many green open spaces, plentiful benches and improved lighting. A range of general suggestions came up: the heavy industry that generates a lot of heavy vehicle traffic should be relocated; the traffic within the study district should be minimised; bicycle traffic on pedestrian walkways should be prohibited; more pedestrian crossings, preferably with traffic lights, should be added, and the maintenance of walkways should be improved both in winter and summer.

Based on the systematisation principles developed during the research circle discussions, the following measures to be taken emerged:

1. *Traffic technology measures* included more pedestrian crossings, more intersections regulated by traffic lights, separation of pedestrians and cyclists, improved dispersion of traffic, wider pavements, improved signposts, improved integration of pedestrian routes, reduction of speed limits to 30 km/h, and the introduction of one-way streets.
2. *Design/maintenance measures* focused on pedestrian walkways included more even surfaces on walkways and paths, lesser sloping walkways, curb cuts at pedestrian crossings and other strategic places, improved snow removal and non-skid walking surfaces, improved care and pruning of bushes and leaf removal, inspection and improvement of steps and level differences along pedestrian walkways, and more and better designed bus stops. It also included more benches and improved lighting.

The final task of the research circle was to formulate a strategy for making the suggested improvements. The elderly inhabitants gave first priority to improve accessibility and usability for mobility device users. Traffic technology improvements came next, while improvements to public transport were third in the order of priority. The priorities made by the municipality representatives were somewhat different. Their primary priority was for those

Table 2 Environmental improvements agreed upon in the research circle

Type of environmental improvement
General improvements
Separation of pedestrians and people using bicycles and mopeds
Lower speed limits
Improved snow removal and non-skid surfaces (better standards)
Improved maintenance (leaf removal, street sweeping, etc.)
Selected measures at specific locations
Wider sidewalks
Rounded curbs at pedestrian crossings and other strategic locations
More even surfaces on sidewalks, especially along specified stretches

easily implemented improvements at low cost. Thereafter in order of priority, they listed improvements requiring more planning but still relatively easy to realise, while improvements requiring large investments in planning and financial resources were given third priority. The improvements finally agreed upon by both the groups is presented in Table 2.

Based on this, subsequently a proposal for an improvement programme was worked out by the municipality and presented in the research circle, including a time plan to carry out the different measures. Even though there were budget restrictions requiring political decisions, some of the improvements were seen as measures, which were already part of their ongoing maintenance programme, and would hence be possible to implement without delay. The research circle gave their unanimous support for the improvement programme. The research circle discussions also revealed that the local municipal authorities were largely unaware of the kind of environmental details that cause problems for elderly people, while they—as soon as they were notified about the nature of the problems—readily suggested concrete measures that could be taken. It was agreed by all that it was important to adopt a holistic view so that any improvements would benefit as many people as possible, e.g. including children.

Discussion

This project is one among very few examples of user involvement in research targeting societal planning, showing how elderly inhabitants in a residential area can give practical input into what should be done to increase accessibility and safety in their local outdoor environment. Even if the issues raised and the measures prioritised were in line with previous research (Berntman 2003; Humpel et al. 2002; Lavery et al. 1996), the public actors and stakeholders involved in the project were surprised by their character. They had expected more far-reaching high cost proposals, while the problems prioritised by the elder inhabitants in the study district required often only minor and not so costly measures. This kind of reflection lends support to Fudge et al.'s (2007) suggestion that user involvement leads to findings that are more likely to be implemented and shows that elderly inhabitants have the potential to express their needs and demands to exert influence on societal planning processes. Whether the concrete measures now being implemented will really impact on the elderly inhabitants' perceptions of accessibility and safety and on their outdoor mobility is beyond the scope of this paper. In order to advance our understanding of environmental influence on elderly persons' activities, we must accumulate more knowledge, backed up by scientific evidence, obtained from empirical research (Sugiyama and Ward Thompson 2007). Forthcoming results of the evaluation of the current project will contribute to develop this knowledge.

The overriding prioritisation strategy advocated by the elderly inhabitants taking part in the research circles is worth comment. They argued that the highest priority should be to improve the design of pedestrian walkways to facilitate walking when using rollators. While not so often used in other parts of Europe, rollators (Brandt et al. 2003) are gaining increasing acceptance and are in frequent use in Sweden (Löfqvist et al. 2005). In the current study, this was demonstrated by the fact that 14% of the questionnaire respondents reported that they used a rollator for outdoor mobility. This kind of mobility device is important for enabling elderly people to remain mobile and active, but environmental barriers often cause accessibility and safety problems (Brandt et al. 2003). Data from sub-study 1, (Hovbrandt et al. 2007) showed that older persons using rollators report a lower frequency of outdoor activities than people in the same age group not dependent on such mobility aids, supporting the high priority given by the elderly to improvements supporting the use of wheeled mobility devices.

Reflecting on the kind of outdoor environment problems identified, several of the environmental barriers given high priority for a solution have been identified in previous research. For example, high curbs, pavement widths, uneven surfaces, and lack of sitting places influence walking mobility not only among elderly people but also among people of different ages, with different disability levels (Lavery et al. 1996; Shumway-Cook et al. 2002). The most important contribution offered by our study is that it highlights the value and efficiency of direct communication between users and planners within a local community, made possible and visible by the user involvement approach. While it was not possible to

accommodate all the demands expressed by the elderly inhabitants in the first round of prioritisation, the project created some basic prerequisites for a continued dialogue between the users and the authorities. The long-term development of the study district will indicate whether these signs of emerging empowerment of elderly people are sustainable.

Besides the concrete results leading up to the implementation programme, there were examples of spin-off values gained along the project process. The inhabitants acquired channels for carrying on discussions with the local authorities, and we attribute this kind of outcome to the user involvement approach, moving beyond using elderly people only as data sources. For example, during the research circle discussions, primarily the older inhabitants, but also municipality representatives, brought up the importance of the individual's responsibility for being physically active and motivating themselves to do things together with other people. These discussions led to the search for a natural meeting place within the study district that would provide activities of various kinds. The premises used during the project are now available to the inhabitants for different kinds of activities and meetings, and study circles addressing what elderly people themselves can do to improve their quality of life have been launched (personal communication with municipality representatives). Our study represents an empirical exemplification of different modes of elderly people's engagement with outdoor environments, as put forward by Sugiyama and Ward Thompson (2007). That is, outdoor environments do not only nurture participation in physical activity and exposure to natural elements, they also support social interaction with friends and neighbours.

When it comes to the mixed-method research design applied, the results presented rest on solid ground. Most commonly, projects aiming at environmental improvements rest more on practical experiences and tacit knowledge than on research-based methodology, and measures might be taken ad hoc (Iwarsson and Ståhl 2003). In the present study, accessibility problems and perceived risk factors were surveyed and documented by means of three different methods using an embedded design (Creswell and Plano Clark 2007), including user perceptions as well as observations made by researchers. An obvious advantage of objective measurement is its direct connection with environmental attributes, often easily translated into policy recommendations and design guidelines. As concerns subjective evaluations, their advantages lie in their involvement of personal judgement made by users. It is important to be aware of the fact that since different people have different lifestyles and activity patterns, the methods used in research on supportive outdoor environments have to be well suited to the target population (Sugiyama and Ward Thompson 2007). Based on triangulation of data (Patton 2002) generated by different methods in an embedded design (Creswell and Plano Clark 2007), ranging from involving users as data sources to their being partners in research (Reed et al. 2004), the results are highly valid and trustworthy. That is, during the research circles and in the successive analysis the data from the three sub-studies were embedded and used in such a way that they supported each other concerning both, what kinds of shortcomings and obstacles occurred in the outdoor environment, and where they were located. To the best of our knowledge, for this research field, results produced in this way are unique. Besides their obvious value for development of outdoor environments supporting activity, the study, as such, has implications for the development of methods, which allow authentic opportunities for user involvement achieved within the framework of a research project (Ross et al. 2005). In particular, the research circles (Härnsten 1994) proved to be effective for raising awareness among public actors and stakeholders concerning problems in their outdoor environments as perceived by elderly. The elderly inhabitants were convincing and opened the eyes of the municipal engineers and planners in a way that otherwise would have been hard to attain. Further research is needed to explore what makes change possible, i.e. exploring enabling and constraining factors and the role of elder people in influencing societal change (Ross et al. 2005).

Turning to study limitations, it should be emphasised that running projects like this are not a straightforward exercise. There are many pitfalls, not the least in the communication processes among actors. Projects of this kind require careful planning in advance, while at the same time requiring flexibility and creativity to be able to solve problems arising along a project process running for several years. Most important, basic scientific principles often taken for granted by researchers cannot always be followed and negotiations and novel solutions become necessary.

In conclusion, the project "Let's go for a walk" is an example of a research process involving elderly people, resulting in a concrete plan for improvements to their outdoor environment. At this point of time, most of the measures planned have been implemented, and such practical demonstration based on research is still rare. The project contributed to the development of environments supporting activity and participation, based on research with explicit user involvement. The project has received much media attention that has given it regional and national recognition, and in particular, the elderly inhabitants engaged as research partners have become ambassadors for the project. This attention is the ultimate manifestation of user involvement in this research process.

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