Two Dimensions of Participation in Very Old Age and Their Relations to Home and Neighborhood Environments

Maria Haak, Agneta Fänge, Vibeke Horstmann, Susanne Iwarsson

KEY WORDS
- ENABLE-AGE
- healthy aging
- occupational therapy
- participation

This study aimed to capture and operationalize the concept of participation among people who are very old (age > 80) and to investigate whether and how aspects of housing and neighborhood environments relate to participation in very old age. Two dimensions of participation—performance-oriented participation and togetherness-oriented participation—emerged from an earlier qualitative study and were operationalized and validated in this study with quantitative variables. Both objective and perceived housing and neighborhood aspects were significantly related to, in particular, performance-oriented participation and, to a lesser extent, to togetherness-oriented participation. Most interventions in occupational therapy are accomplished within the home for very old people, but our results imply that there are potential interventions to accomplish on a societal level as well. In this respect, our study contributes to the knowledge in the field and has the potential to support the development of novel occupational therapy interventions targeting society at large.


Participation in daily life is essential for leading a satisfactory and independent life at home in very old age (>80 years old; Avlund, Holstein, Mortensen, & Schroll, 1999), and it is significantly important for older people’s well-being (Christiansen & Baum, 2005; Law, 2002; Wilcock, 1998). The home and the neighborhood environment are the major living spaces in very old age, and most daily activities take place there (Baltes, Maas, Wilms, Borchelt, & Little, 1999). From a health promotion perspective, it is thus interesting to uncover factors within the home and the neighborhood environment that may influence participation in very old age, in particular because this area of research is relatively unexplored.

Participation is a concept gaining increasing attention among researchers and practitioners in many fields, although no consensus exists in the literature regarding its definition and operationalization (e.g., Bath & Deeg, 2005). Participation is a broad concept. Historically, it has been developed and used within the disability movement and thus has become a political term to describe disability rights (Gustavsson, 2004). More recently, however, participation has been defined from an individual perspective. For example, in the International Classification of Functioning, Disability and Health (ICF; World Health Organization, 2001), participation is defined as “the person’s involvement in a life situation” and has nine domains: (1) learning and applying knowledge; (2) general tasks and demands; (3) communication; (4) mobility; (5) self-care; (6) domestic life; (7) interpersonal interactions and relationships; (8) major life areas; and (9) community, social, and civic life. Widening the definition, Polgar and Landry (2004) claimed that participation includes the engagement of a person’s body, mind, and soul. In addition, skills and competencies are acquired through participation; thus, participation is necessary for our connection with others and is a way of finding purpose and meaning in life.
Law, 2002). Borell, Asaba, Rosenberg, Schult, and Townsend (2006) advanced the understanding of participation and its relation to occupation, finding that participation has to do with agency, being active, and being social.

Given the lack of consensus with regard to the definition, a paucity of assessment instruments capture participation. One of the few instruments available is the Assessment of Life Habits (Noreau et al., 2004), a comprehensive instrument for evaluating participation in significant social role domains, such as recreation and community life (Noreau et al., 2004). The Participation Survey/Mobility (Gray, Hollingsworth, Stark, & Morgan, 2006) targets participation for people with mobility limitations. The instrument comprises 20 major life activities categorized in six domains according to the ICF. Yet another instrument is the self-reported Impact on Participation and Autonomy questionnaire (Cardol, de Hahn, van den Bos, de Jong, & de Groot, 1999), which reflects different life situations such as autonomy outdoors, family role, social relationships, and work and education. As illustrated here, the instruments are inconsistent in their vocabulary, indicating the need for a common language for describing and assessing participation as a prerequisite for further methodological development within the field.

People older than age 80 spend most of their time within their home and neighborhood environment (Baltes et al., 1999), so that characteristic must be considered when attempting to capture participation within this age group. In addition, few empirical studies focusing on participation in old age and very old age have been published. For example, Sixsmith and Boneham (2003) found that older men’s participation in community life was constructed around their health, family, and employment status. Relationships between social participation and disability (Mendes de Leon, Gold, Glass, Kaplan, & George, 2001), between participation and survival (Glass, Mendes de Leon, Marottoli, & Berkman, 1999), and between participation and mortality (Lennartsson & Silverstein, 2001) also have been investigated. Finally, Mollenkopf et al. (1997) found that physical aspects of the neighborhood affected out-of-home mobility and social relationships. Accordingly, it is clear from the literature that studies investigating relationships between participation and aspects of housing and neighborhood are lacking. Such investigations are needed.

In a previous qualitative study, we explored how very old single-living persons in urban districts in Sweden experienced participation as related to home and neighborhood (Haak, Dahlin Ivanoff, Fänge, Sixsmith, & Iwarsson, 2007). Two kinds of participation emerged: performance-oriented participation (i.e., performance of activities for the purposes of helping others as well as for one’s own personal satisfac-

**Project Context**

This study used data from a major, cross-national, interdisciplinary research project, ENABLE-AGE, which included five European countries: Sweden, the United Kingdom, Germany, Latvia, and Hungary (Iwarsson, Sixsmith, et al., 2005). The ENABLE-AGE project was explicitly exploratory in nature; its main aim was to examine the home environment as a determinant for autonomy, participation, and well-being among very old people (N = 1,918) living in single-person households in geographically defined urban areas. The ENABLE-AGE survey study was based on a comprehensive questionnaire that included study-specific questions as well as validated and reliable instruments, whereas a qualitative approach was used for the ENABLE-AGE in-depth study (Haak, Dahlin Ivanoff, Fänge, Sixsmith, & Iwarsson, 2007). Trained interviewers accomplished data collection at home visits. Follow-up was conducted in two data collection waves (T1 and T2) at 1-year intervals. This study was based on the Swedish part of the ENABLE-AGE Survey Study.

**Sample Description**

The target population was very old persons living alone in geographically defined urban areas in Sweden. The study sample was drawn at random from the Swedish Central Population Register and stratified for age and gender. The Swedish ENABLE-AGE survey study database consists of data on 397 persons living alone in three municipalities...
(Halmstad, Helsingborg, and Lund); half of them were age 80 to 84, and half were age 85 to 89; 25% were men. Ten people were later excluded because of extensive internal missing data at the T1 data collection. Moreover, 73 participants dropped out between T1 and T2. The most common reason for dropout was poor health or too strenuous of an interview (n = 30), followed by dropout due to death (n = 16) or other reasons (n = 27). Information on deceased persons was collected from the Swedish Central Population Register (Iwarsson, Sixsmith, et al., 2005). All in all, 314 participants were included in this study. A detailed description of the participants is presented in Table 1.

Ethics

All participants were enrolled after informed consent, following national ethical guidelines and procedures. All data were handled with strict anonymity. Participants were informed that they were allowed to withdraw from the interviews if they wished, including potential withdrawal of their data up to the time of publication of results. The ENABLE-AGE Survey Study was approved by the Ethics Committee of Lund University.

ENABLE-AGE Survey Study Questionnaire

The survey study questionnaire consisted of questions on aspects of housing and health and was based on well-established methods from psychology, gerontology, geriatrics, occupational therapy, and social sciences. It included project-specific questions. In all, approximately 1,600 variables were involved. With its richness of details on objective and perceived aspects of housing, as well as on aspects of health such as participation and activities of daily living (ADLs), the ENABLE-AGE database is unique (Iwarsson, Sixsmith, et al., 2005).

There were some differences in the instrumentation at the two data collection waves. Most important for this study, during the project process, it was demonstrated that the T1 questionnaire did not capture the concept of participation sufficiently. Thus, on the basis of subsequent experience, a set of questions intended to capture participation in greater depth was developed and included at T2. At the same time, to keep the T2 questionnaire within the resource limits for the data collection and to reduce the strain on the very old participants, several of the instruments covering aspects of housing and neighborhood environments had to be excluded. Thus, a comprehensive set of variables on aspects of housing and neighborhood was available only at T1.

Operationalization of Participation

As the findings from a previous study suggested, participation in very old age comprises two different dimensions: performance-oriented participation and togetherness-oriented participation (Haak, Dahlin Ivanoff, et al., 2007). On the basis of current literature and their experiences in the field, four occupational therapy researchers independently scrutinized the T1 and T2 questionnaires to identify items in the ENABLE-AGE survey questionnaire that reflected these two dimensions. After several rounds of discussions, researchers finally agreed on a set of items and variables from the T2 questionnaire that illustrated performance-oriented participation and togetherness-oriented participation.

For each of the two dimensions, the selected items and variables were aggregated into a smaller number of new variables that were used to order everyone in the sample according to his or her level of participation. As part of this process, the original response alternatives were aggregated into new response alternatives to allow for the ranking procedure. The procedure used is a generalization of the procedure used in the well-known Mann–Whitney test (where pairwise comparisons are based on only one variable), and similar generalization has been used in connection with ADL assessments (Iwarsson & Lanke, 2004). In other words, in this study, every person in the sample was compared with every other person. For each comparison, one person was judged to have a definitively higher level of participation if the value of each variable indicated a level of participation that was at least as high as the level indicated for the other person, on the condition that the values were not all equal. Then, for each person, the rank score of the participant was calculated as the number of other people having a definitely smaller level of participation minus the number of other people having a definitely higher level of participation. In

<table>
<thead>
<tr>
<th>Variable</th>
<th>T1 (N = 314)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, 80–89 years, Mdn (q1, q3)</td>
<td>85 (81, 87)</td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>82 (26)</td>
</tr>
<tr>
<td>Women</td>
<td>232 (74)</td>
</tr>
<tr>
<td>Number of functional limitations, n (%)</td>
<td>2 (1, 4)</td>
</tr>
<tr>
<td>Mobility devices, n (%)</td>
<td></td>
</tr>
<tr>
<td>Use of mobility device</td>
<td>129 (41)</td>
</tr>
<tr>
<td>No use of mobility device</td>
<td>185 (59)</td>
</tr>
<tr>
<td>Housing, n (%)</td>
<td></td>
</tr>
<tr>
<td>Ordinary housing</td>
<td>282 (90)</td>
</tr>
<tr>
<td>Sheltered housing</td>
<td>32 (10)</td>
</tr>
<tr>
<td>Number of diseases, Mdn (q1, q3)</td>
<td>5 (2, 9)</td>
</tr>
<tr>
<td>Self-perceived health, n (%)</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>46 (15)</td>
</tr>
<tr>
<td>Very good</td>
<td>81 (26)</td>
</tr>
<tr>
<td>Good</td>
<td>98 (31)</td>
</tr>
<tr>
<td>Fair</td>
<td>78 (25)</td>
</tr>
<tr>
<td>Poor</td>
<td>11 (4)</td>
</tr>
</tbody>
</table>

Note. q1 = quartile 1; q3 = quartile 3.

According to the Housing Enabler (Iwarsson & Slaug, 2001).
this way, one rank score was assigned to every person in the sample for the level of performance-oriented participation, and one rank score was assigned for the level of togetherness-oriented participation. To justify the operationalization of the two dimensions of participation in this way, correlations were calculated between variables in each group of aggregated variables used in the ranking procedures. Moreover, for each of the two dimensions of participation, the aggregated variables were all correlated to the rank scores. Finally, the two rank scores were correlated.

**Housing and Neighborhood Variables**

A set of variables describing aspects of objective and perceived housing was selected from the T1 survey study questionnaire. The perceived housing aspects were selected on the basis of previous research identifying a valid model of perceived housing (Oswald et al., 2006). The rationale for selecting objective housing aspects also was based on previous research identifying several variables significant for healthy aging (Iwarsson, Horstmann, & Slaug, 2007; Oswald et al., 2007).

**Objective Aspects.** Responding to the question “How long have you lived in this neighborhood?” the respondent was free to stipulate number of years lived in the area (Iwarsson, Sixsmith, et al., 2005). The number of environmental barriers in the home and the magnitude of accessibility problems were assessed using the Housing Enabler instrument (Iwarsson & Slaug, 2001). For this study, a cross-national research version was developed and tested that demonstrated sufficient reliability (Iwarsson, Nygren, & Slaug, 2005). The instrument is administered in three steps, the first of which is the dichotomous assessment of the personal component of accessibility, administered by means of interview and observation and covering both functional limitations (13 items) and dependence on mobility devices (2 items). The second step is the assessment of the environmental component of accessibility, administered as a detailed observation assessing the presence or absence of environmental barriers in the home and the immediate outdoor environment (188 items). The results of the second step constitute the variable number of environmental barriers. The third step of the Housing Enabler instrument is the calculation of the magnitude of accessibility problems, which generates a total score constituting the variable accessibility problems. When no functional limitations or dependence on mobility devices are present, the score is always 0; higher scores mean more accessibility problems (for more details, see Iwarsson, 2005).

**Perceived Aspects.** Usability was assessed with the 16-item Usability in My Home Questionnaire (scored 1–5; Fänge & Iwarsson, 1999, 2005), which addresses the degree to which the physical housing environment supports the performance of activities at home. The items of the instrument address different aspects of usability (Fänge & Iwarsson, 2003): “activity aspects” (4 items, α = .84) and “physical environmental aspects” (6 items, α = .84). The 28-item Meaning of Home Questionnaire (scored 0–10; Oswald, Mollenkopf, & Wahl, 1999) was used to assess self-perceived physical, behavioral, cognitive–emotional, and social aspects of home. The items in each area were purposefully selected to represent a wide range of topics; thus, internal consistency was expected to be rather low (Kline, 1993). Internal consistency for each of the four meaning-of-home subscales was as follows: physical aspects, 7 items, α = .69; behavioral aspects, 6 items, α = .67; cognitive–emotional aspects, 10 items, α = .66; and social aspects, 5 items, α = .55.

External housing-related control beliefs were assessed with the Housing-Related Control Beliefs Questionnaire (Oswald, Wahl, Martin, & Mollenkopf, 2003) using data collected by means of a 16-item subscale (scored 1–5, α = .72). External control means either that some other person is responsible or that things happen by luck, chance, or fate. Housing satisfaction was assessed with the single-item evaluation “Are you happy with the condition of your home?” (scored 1–5), adapted from the Housing Options for Older People questionnaire (Heywood, Oldman, & Means, 2002; Sixsmith & Sixsmith, 2002; for details of these instruments, see Oswald et al., 2006).

Perceived aspects of neighborhood attachment reflect the bonding to the outdoor environment (scored 0–1; Oswald, Heiber, Wahl, & Mollenkopf, 2005). The environmental characteristics of the instrument were differentiated in three domains: (1) amenity-oriented basic physical conditions and needs, (2) comfort-oriented higher-order physical conditions and needs, and (3) social conditions and needs. Seven items of 27 (Table 2) were included in the analysis. The rest of the items were excluded because of lack of variation in answers or because they were outside the scope of the current article.

**Relations Between Housing and Neighborhood Environment Aspects and Dimensions of Participation.** Because it was restricted by the differences in instrumentation between the T1 and T2 data collections already accounted for, this analysis was of necessity designed to investigate whether and how aspects of housing and neighborhood environment at T1 were related to two dimensions of participation at T2, that is, 1 year later. Thus, all objective and perceived aspects of housing and neighborhood environment at T1 were related to performance-oriented and togetherness-oriented participation at T2 (Table 2). Thus, performance-oriented participation (based on 6 variables, described in the Results
section) was related to 18 housing and neighborhood variables; likewise togetherness-oriented participation (based on 4 variables, described in the Results section) was related to the same 18 housing and neighborhood variables.

Statistical Analyses

Background characteristics are described either by frequency distributions or by medians and quartiles. Spearman’s rank correlation was calculated between variables in each group of aggregated variables used in the ranking procedures; moreover, for each of the two dimensions of participation, the aggregated variables were all correlated, again by means of Spearman’s rank correlations, to the rank score. The relations between the housing and neighborhood aspects and the rank scores were analyzed with Spearman rank correlation coefficients for aspects assessed on an ordinal scale and with the Mann–Whitney test for the aspects dichotomously assessed.

Table 2. Relation Between Housing and Neighborhood Variables and Performance- and Togetherness-Oriented Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance-Oriented Participation</th>
<th>Togetherness-Oriented Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r_s )</td>
<td>( p )</td>
</tr>
<tr>
<td>Objective housing aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years in the neighborhood</td>
<td>-.094</td>
<td>.096</td>
</tr>
<tr>
<td>No. of environmental barriers</td>
<td>-.064</td>
<td>.256</td>
</tr>
<tr>
<td>Accessibility problems</td>
<td>-.565</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>Perceived housing aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UIMH 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.258</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>UIMH 3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.286</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>MOH 1&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.017</td>
<td>.769</td>
</tr>
<tr>
<td>MOH 2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.368</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>MOH 3&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.048</td>
<td>.399</td>
</tr>
<tr>
<td>MOH 4&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.140</td>
<td>.014</td>
</tr>
<tr>
<td>External HCQg</td>
<td>-.314</td>
<td>&lt;.0005</td>
</tr>
<tr>
<td>Housing satisfaction</td>
<td>.029</td>
<td>.607</td>
</tr>
</tbody>
</table>

Table 3. Rank Correlations Within the Six Variables Constituting the Domain Performance-Oriented Participation, with the Domain-Specific Rank Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For Others</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>For others</td>
<td>—</td>
</tr>
<tr>
<td>Fitness activities</td>
<td>—</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>—</td>
</tr>
<tr>
<td>Outdoor walking</td>
<td>—</td>
</tr>
<tr>
<td>I-ADL</td>
<td>—</td>
</tr>
<tr>
<td>Independence</td>
<td>—</td>
</tr>
<tr>
<td>Rank score for performance-</td>
<td>.445</td>
</tr>
<tr>
<td>oriented participation</td>
<td></td>
</tr>
</tbody>
</table>

Note. \( r_s \) = Spearman’s rank correlation coefficient; UIMH = Usability in My Home; MOH = Meaning of Home.

<sup>a</sup>UIMH, activity aspects. <sup>b</sup>UIMH, physical environmental aspects. <sup>c</sup>MOH, physical aspects. <sup>d</sup>MOH, behavioral aspects. <sup>e</sup>MOH, cognitive–emotional aspects. <sup>f</sup>MOH, social aspects. <sup>g</sup>External housing-related control beliefs.

Any \( p \) values below .05 were considered to be statistically significant. With regard to the effect sizes of correlation coefficients, the interpretation followed Cohen’s (1992) proposal recommending that a numerical value of \( r < .2 \) be considered a “small effect”; .5, a “medium effect”; and .8, a “large effect.”

Results

Operationalization of Participation

Altogether, 16 items representing performance-oriented participation were identified, subsequently aggregated into six new variables: performance for others, performance of fitness activities, performance of leisure activities, outdoor walking, instrumental ADL (I-ADL), and perceived independence. Because of differences in scale constructions, higher values of performance for others, performance of fitness activities, performance of leisure activities, and perceived independence indicate a higher level of participation, whereas higher values of I-ADL and outdoor walking indicate a lower level of participation. The participants’ rank score of performance-oriented participation was based on these variables (Table 3).

Likewise, 18 items were found to represent togetherness-oriented participation and subsequently were aggregated into four new variables: participation outside home, participation in leisure activities with others, participation at home, and participation at social activity centers. Higher values on all of these variables indicate higher level of participation. From these variables, the rank scores of togetherness-oriented participation were calculated (Table 4).

All correlations between the variables contributing to performance-oriented participation and all correlations among the performance-oriented participation variables and togetherness-oriented participation variables were considered to be significant. Consequently, it was of interest to investigate the relations between these two domains of participation with the rank scores of the two dimensions of participation. These correlations were calculated by means of Spearman rank correlations. The two variables representing the performance- and togetherness-oriented participation were again dichotomously assessed.
between the variables contributing to togetherness-oriented participation were strongly significant, with p values ranging from .007 to smaller than .0005 (Tables 3 and 4). Moreover, a medium significant correlation (rs = .325, p < .0005) between the rank scores for the two dimensions of participation was found.

Relation Between Housing and Neighborhood Environment Aspects and Dimensions of Participation

With respect to objective and perceived aspects of housing and neighborhood, significant relations with both dimensions of participation were found. More specifically, social aspects of the meaning of home, accessibility problems, living close to friends and relatives, and having cultural opportunities were related significantly to both performance-oriented and togetherness-oriented participation. In addition, activity aspects and physical environmental aspects of usability, behavioral aspects of the meaning of home, and external housing-related control beliefs correlated significantly with performance-oriented participation. Conversely, having good local transportation was related solely to togetherness-oriented participation (Table 2). No statistically significant relationships were found between the two dimensions of participation and the number of years the person had lived in the neighborhood, number of environmental barriers within the home, physical environmental aspects of meaning of home, satisfaction with housing conditions, living where the action is, access to shops and services, medical care in the vicinity, and feelings of neighborliness (Table 2).

Because of differences in scale construction, the values derived can be interpreted in different ways. That is, higher values in the variables years in the neighborhood, usability, meaning of home, housing satisfaction, and perceived neighborhood aspects indicate higher levels of participation, whereas higher values with regard to the variables environmental barriers, accessibility problems, and external housing-related control beliefs indicate lower levels of participation.

Discussion

This study demonstrated that it is possible to capture and operationalize the concept of participation among very old people in terms of two dimensions: (1) performance-oriented participation and (2) togetherness-oriented participation. In addition, our investigation of whether and how aspects of housing and neighborhood environments related to participation showed that higher levels of perceived housing aspects were related to higher levels of performance-oriented participation, whereas perceived neighborhood aspects, such as living close to friends and relatives and having cultural opportunities in the vicinity, were related to higher levels of both dimensions of participation.

Operationalization of Participation

The first important result of this study concerns the validity of our operationalization of participation. The two dimensions of participation identified in our previous qualitative study on a subsample of the Swedish ENABLE-AGE survey study sample (Haak, Dahlin Ivanoff, et al., 2007) laid the conceptual ground for our operationalization. The use of experts for selection and operationalization purposes is an acknowledged method of establishing validity (DePoy & Gitlin, 1998), thus contributing to the validity of our results. Our next step in the operationalization procedure was to aggregate the original items into a smaller number of interpretable variables to make the ranking procedure feasible. To be valid, items and aggregated variables should be moderately correlated to each other and to the specific dimension of the construct of interest (Streiner & Norman, 2003)—in this case, participation. In this respect, the fact that all items included in the two participation dimensions correlated significantly with each other indicates that our operationalization was valid. Moreover, with respect to the validity of the two participation dimensions, the fact that a medium significant correlation between the rank scores for the two dimensions was found indicates that they are related but different. That is, we conclude that they hold as dimensions of the same underlying construct.

General agreement could not be reached on definitions of the two types of participation considered in this study, and we made no attempt to construct a measure of participation. The results, however, could be considered as a first, early step toward instrument development aiming at capturing participation in very old age. Thus, taking our suggestion one step further, a next step could be to apply the aggregated
participation variables constructed for this study to other samples representing the target group.

Relating our operationalization to those of other studies, Borell et al. (2006), for example, identified four themes relating to participation: (1) taking initiative and making choices, (2) doing something physical, (3) doing something social, and (4) doing something for others. Sørensen, Axelsen, and Avlund (2002) operationalized social participation into three variables: (1) paying visits to others, (2) receiving visitors at home, and (3) participating in social activities outside home. Among other attempts to define dimensions of participation, Brandt (2003) emphasized that mobility is a prerequisite for participation, suggesting mobility-related participation as one dimension of participation. These different operationalizations to some extent mirror the dimensions of participation as operationalized in the current study, thus supporting the validity of our results.

On an overarching level, no consistent and widely accepted understanding of participation exists. The concept can be defined from a societal or an individual perspective (Gustavsson, 2004), and the two dimensions operationalized in the current study mirror a mixture of those perspectives. Thus, a clear need remains to continue the process of concept definition and refinement.

In the next step of this study, to make statistical analyses feasible, the participants were ranked according to their level of participation. The rank score could have been constructed in several ways; an alternative considered was to keep the original items when constructing the rank order, but the computations would have been more difficult to perform. Moreover, despite the fact that reducing response alternatives always results in loss of efficiency and subtle information (Streiner & Norman, 2003), several response alternatives were aggregated from a 5-point ordinal scale into a dichotomous scale. This drawback is clear; however, we found that the information lost was of minor importance in this case.

Home and Neighborhood Environments

With respect to the second aim of our study, that is, whether and how aspects of housing and neighborhood environments related to participation in very old age, some of our results are particularly worth discussing. More specifically, for perceived aspects of neighborhood, our results demonstrate that participants who had good local transportation in the vicinity reported significantly higher togetherness-oriented participation, whereas lack of cultural opportunities in the vicinity contributed significantly to a lower level of togetherness-oriented participation. These results were to some extent expected and are in line with previous studies. For example, Mollenkopf et al. (1997, 2004) found that the availability of and satisfaction with public transportation influenced out-of-home mobility positively, thus presumably contributing to participation. Moreover, participation in cultural activities has been associated with lower mortality (Bygren, Konlaan, & Johansson, 1996; Konlaan, Bygren, & Johansson, 2000) and declining risk of depressive symptoms in old age (Braam et al., 2004). Although participation in different cultural activities often requires travel by car or public transportation, using public transportation is often a too-demanding task for many older people (Jensen, Iwarsson, & Ståhl, 2002). Accordingly, it appears as though accessibility and usability problems in the neighborhood increase the risk of exclusion from important domains of participation for people who are very old. Hence, one could assume that participation in activities in the neighborhood would be enhanced if the neighborhood feels safe and public facilities and other services are accessible and usable and render possibilities for engagement in leisure activities. Thus, to plan for efficient interventions to support the participation of people who are very old, occupational therapists can take on an important role through new kinds of engagement in community planning concerning public transportation, housing, or improvement of neighborhood environments.

Another important result was that perceived aspects of housing were significantly related to performance-oriented participation, whereas no such relationships were found with respect to togetherness-related participation. Performance-oriented participation to a large extent comprises variables that could be considered activities, although many aspects of perceived housing relate to activities as well. In this respect, our results were expected. Similar results were suggested by Oswald et al. (2007), where perceived aspects of housing were related to independence in daily activities. Such results indicate a relationship between participation and independence (Haak, Dahlin Ivanoff, et al., 2007; Haak, Fänge, Iwarsson, & Dahlin Ivanoff, 2007), but further investigation is needed.

Limitations

A unique strength of this study was the methodology—the ability to target participation by combining qualitative and quantitative data from the same project (i.e., ENABLE-AGE; Iwarsson, Sixsmith, et al., 2005). Using a mixed-methods approach is a powerful way to strengthen the validity of a study because the weakness of one method is juxtaposed with the strength of another (Patton, 1990). At the same time, different methods capture different aspects of the phenomenon of interest (Sale, Lohfield, & Brazil, 2002), in our case, participation. When it comes to combining in-depth interviews with quantitative survey data, some studies available use different samples in the same study (e.g., Clarke, 2003), whereas others combine data from the same sample.
(Chan, 2001). Both approaches have their drawbacks, but in our opinion, we used the data at hand in an innovative, yet valid and efficient, way.

One drawback is that the original items and variables used derived from a large project accomplished and finalized before we started the analyses for the current study; thus, it was not possible to influence the items and variables available. Even though the ENABLE-AGE survey study questionnaire included a considerable variety of variables of potential value for the current project, we nevertheless concluded that we lacked certain types of items or variables in one and the same data collection wave. One year is a considerable time in very old age, and one could rightfully question the appropriateness of this design. Because previous studies indicate that objective (Iwarsson, 2005; Iwarsson & Wilson, 2006; Nygren & Iwarsson, 2004) and perceived housing aspects (Nygren & Iwarsson, 2004) are rather stable over time, however, we do not consider this interval to be a major problem. Instead of being considered as a drawback, this approach generated results with potential to support hypotheses for forthcoming longitudinal studies based on ENABLE-AGE data. In addition, even if it was not the aim of the current study, an interesting way to interpret the results would be in terms of whether and how aspects of housing and neighborhood actually can predict participation in very old age. Such questions remain to be investigated.

**Practical Implications**

Many occupational therapy interventions are conducted within the homes of clients living in the community, and traditional interventions, such as prescription of assistive devices and home modifications, often are initiated to enhance activity performance and participation. Therefore, the fact that performance-oriented participation was related to aspects of home and neighborhood environments was not surprising and supported the importance of such interventions. However, the results indicate that it is also important to promote together-ness-oriented participation, and the results can be used to inspire the development of new kinds of occupational therapy interventions. More specifically, increased attention to social intervention and public planning (e.g., within the field of public transportation; Iwarsson, Stålhl, & Carlsson, 2003) appears to be crucial. Another domain of concern for occupational therapists is to make more efforts in societal planning processes focusing on housing provision for very old people, involving different housing alternatives such as ordinary housing, sheltered housing, institutions, or in-between solutions. Besides housing issues, as Brandt (2003) and Valdemarsson, Jernryd, and Iwarsson (2005) suggested, interventions targeting neighborhood environments, such as improvement of walking surfaces or placement of benches in the outdoor walking environment, could influence participation in very old age, thereby contributing to older people’s health (Maier & Klumb, 2005).

**Conclusion**

In conclusion, two dimensions of participation identified in an earlier qualitative study, performance-oriented participation and togetherness-oriented participation, were validated in this quantitative study, which was based on data from the large-scale ENABLE-AGE Project. Moreover, both objective and perceived housing and neighborhood aspects were related to those dimensions of participation. An important goal in health promotion is to create home and neighborhood environments supporting healthy aging and subjective well-being. In this respect, our study is an important contribution to the knowledge in the field, having potential to support the development of novel occupational therapy interventions targeting not only individual clients but society at large. ▲

**Acknowledgments**

This study was based on data from the European Commission–funded project Enabling Autonomy, Participation, and Well-Being in Old Age: The Home Environment as a Determinant for Healthy Ageing (ENABLE-AGE, QLRT-2001-00334). The authors thank all consortium and national team members for their contributions. The final preparation of this article was accomplished in the context of the Centre for Ageing and Supportive Environments at Lund University, financed by the Swedish Council for Working Life and Social Research. The authors are also grateful to the Swedish Research Council for Environment, Agricultural Sciences, and Spatial Planning and the Swedish Research Council for additional funding.

**References**


