In this article, the need for an explicit consideration of the environment in order to address everyday competence (EC) in old age is illustrated based on an analysis of the day-to-day challenges of visually impaired older adults. Data are based on a sample of elderly adults suffering from different degrees of visual impairment (visually severely impaired vs blind, each N = 42) and a control group of visually unimpaired elderly persons (N = 42) with age means between 74.9 and 76.8 years. Findings underscore that: (a) EC, regarded as an outcome, is negatively affected by low person-environment fit in the home environment in visually impaired older adults but not in the visually unimpaired elderly population; (b) EC, understood as daily compensatory processes, is more pronounced in the visually impaired with respect to some compensation modes (e.g., use of latent skills), but not all; and (c) EC, as a predictor variable for outdoor behavior, assumes a particularly critical role when outside environmental press is high. 

Key Words: Everyday competence, Age-related visual impairment, Person-environment perspective

Everyday Competence in Visually Impaired Older Adults: A Case for Person-Environment Perspectives

Hans-Werner Wahl,1 Frank Oswald,2 and Daniel Zimprich3

The psychology of aging and gerontology, in general, have witnessed the emergence of everyday competence (EC) as an increasingly important theoretical and empirical concept (e.g., Diehl, 1998; Diehl, Willis, & Schaie, 1995; Willis, 1991). However, although it has been noted frequently by researchers in the field that any analysis of EC should incorporate variables of the physical environment (M. Baltes, Maas, Wilms, & Borchelt, 1996; Willis, 1991), environmental constituents of EC have not received a great deal of attention. The major objective of this article is to reduce this gap in the existing literature by focusing on EC in one specific subgroup of older adults, namely the visually impaired.

Visual impairment is a common chronic condition in old age. It is estimated that about 5% of older adults aged 65 and older living in private households, and about twice this rate in older adults aged 80 and over, suffer from severe age-related visual impairment (e.g., Salive et al., 1992). Moreover, this prevalence rate is significantly higher in older adults who reside in nursing homes (Horowitz, 1994). Recently, the psychosocial consequences of severe visual loss in late life with respect to depression, leisure activities, and EC have received considerable attention from gerontological researchers (e.g., Heinemann, Colorez, Frank, & Taylor, 1988; Horowitz, 1995; Rudberg, Fumer, Dunn, & Cassel, 1993). This body of work has clearly shown that visual impairment is associated with increased depression and is related to losses in EC.

Losses in EC in visually impaired older adults, however, deserve further in-depth analysis. In particular, it is crucial to acknowledge that visual impairment is directly linked to functional declines that affect older adults' relations with and to their physical environment (Lawton, 1982; Wahl, 1994, 1997). In sum, being visually impaired and being old can be viewed as a constellation that produces a "double jeopardy" and a particular vulnerability to contingencies in the physical environment. Given this general background, a person-environment perspective (e.g., Carp, 1987; Lawton, 1982) becomes indispensable to a proper description of EC in visually impaired older adults. However, person-environment issues have received little attention in the existing empirical literature on visually impaired elders (Wahl, 1997). Hence, what is true with respect to the general empirical literature on EC, namely that there is a lack of empirical work on person-environment issues (Diehl et al., 1995; Willis, 1991), is equally true for EC in older adults coping with severe visual loss.

Adopting a person-environment perspective on age-related visual impairment results in at least three
different uses of the term EC. First, EC can be seen as the outcome of person-environment interchange. By considering EC as an outcome variable, a person-environment fit approach may be regarded as most promising. According to Kahana (1982) and Carp (1987), it is not the capabilities of the elderly person per se that lead to variability in adaptational outcomes but the fit or lack of fit between the person’s capabilities or needs and his or her environmental conditions and demands. Using Carp’s terminology, environments can be more or less complementary in compensating for existing losses, or more or less similar in their provision of opportunities to satisfy so-called higher-order needs. Visual impairment is a prototypical risk situation for a person-environment misfit; most environments do not directly accommodate the special needs associated with chronic visual loss, nor do they support the remaining action potentials of visually impaired elderly adults (Hiatt, 1987). Thus, the first hypothesis of this research is that EC in visually impaired older adults is reduced when the fit between person and living environment is low. Also, it is expected that there is no relation between person-environment fit and EC in the case of visually unimpaired and otherwise comparable older adults.

Second, EC can be seen as a process that reflects the active and passive regulation of person-environment relations. Looking at EC as a process variable puts emphasis on the efforts of visually impaired older adults to arrange and rearrange person-environment relations in order to maintain and enhance the probability of desired end states. Because this understanding of EC emphasizes the capability of the elderly person to use the potential and resources of the physical environment, Lawton’s conception of proactivity fits well with this perspective on EC (Lawton, 1989). According to this view, older adults are not mere pawns of their surroundings but also actively shape their environments in order to maintain independence and to attain important life goals. A prototypical example of proactivity in visually impaired older adults can be seen in their use of compensation as method of coping with existing discrepancies between personal competence and environmental demands (see also Bäckman & Dixon, 1992). Although the use and day-to-day importance of compensatory strategies in visually impaired persons is well-known to practitioners in the domain of rehabilitation, there is very little empirical research on this topic. Thus, it is an objective of this study to examine this component of EC and to obtain a comprehensive profile of the compensation strategies of visually impaired older adults. This is done by examining both older adults’ person-related and environment-related compensatory behaviors. Besides this descriptive intention, the second hypothesis of this research is that compensation efforts are more frequently observed in visually impaired older adults than in visually unimpaired older adults.

Third, EC can be seen as a predictor variable that influences a variety of outcomes in visually impaired older adults. This approach is in line with the press-competence model and the environmental docility hypothesis proposed by Lawton and his colleagues (e.g., Lawton, 1982). As has been stated in the well known environmental-docility hypothesis, the lower the competence of the elderly individual, the more pronounced the impact of environmental conditions on the elderly person’s behavior. On the one hand, and applied to visually impaired older adults, negative environment press such as dangerous street-crossing situations will negatively affect the outside behavior. On the other hand, available EC may be able to moderate this effect of the “press” of the environment. Thus, the third hypothesis of this research in its general form is that EC gains significant importance when the press from the physical environment on outcome variables increases in strength. One prototypical behavior in this context is the activity range of visually impaired older adults outside their homes and the extent to which they may use different support conditions (i.e., activities outside the home with or without external help). In particular, two concrete scenarios are envisaged based on our third hypothesis: It is expected that for visually impaired older adults who move outside their homes without any external help the environmental challenge will increase and, as a consequence, the outcome will depend more on their EC. In contrast, for visually impaired older adults who rely on external help for their activities outside their homes and thus minimize the environmental demand, the importance of EC will be lower.

Method

Study Participants

The study sample consisted of 84 older adults with severe age-related loss in vision. Of these 84 older adults, 42 participants were legally but not functionally blind according to the criteria of the German Ophthalmological Society (visual acuity from 20/200 to 20/600, with no severe visual field defects). The remaining 42 older adults were functionally blind (visual acuity less than 20/600 and/or severe visual field defects). In this article, the first group will be referred to as the severely visually impaired, whereas the second group will be referred to as the blind. In all cases, the visual loss had occurred after the age of 55, had existed for at least three months at the time of data collection, and was considered irreversible according to all available ophthalmological treatment options. In addition, a control group of 42 older adults was included in the study. These individuals are referred to as visually unimpaired older adults.

During a period of six months, all patients fulfilling the inclusion criteria were asked to participate in the study by ophthalmologists from 24 practices in Heidelberg, Mannheim, and Ludwigshafen, Germany, as well as two university-affiliated eye treatment centers (in Heidelberg and Mannheim). All of these facilities treat the whole range of age-related eye diseases. Because irreversible visual loss was one criterion of selection, most cataract patients were excluded due to their high chance of regaining a maximum of visual capacity after treatment. From a resulting total of 168 patients,
84 gave their formal consent and went through the study, whereas 84 refused. Based on background information available from ophthalmologists, no selection bias with respect to age, sex, or eye disease could be determined. The visually unimpaired control subjects were recruited through newspaper announcements as well as from older adults visiting their general practitioners in the Heidelberg and Mannheim area for routine medical check-ups; each source contributed 50% of the final control group. The idea behind this strategy was to limit the number of control subjects who were clearly above average regarding health and functioning; this probably would have been the case if we had relied solely on the newspaper sampling strategy.

Table 1 provides a complete overview of sample characteristics. All participants of this study lived in private households and were comparable with respect to age, sex, education, and income. Blind subjects tended to be married more frequently as compared with the other groups, which is also reflected in a lower percentage of single-person households in this group. Visual loss of the severely visually impaired and blind groups was also reflected in the vision screening questionnaire proposed by Horowitz, Teresi, and Cassels (1991); the visually unimpaired participants revealed practically no visual problems in this measure. Duration of visual impairment was comparable between both visually impaired groups. In addition, this study’s participants did not suffer from cognitive and hearing impairments. The absence of medium to severe cognitive impairment was verified by use of a short version of the Mini Mental State Examination, which was also applied as a screening device in the Berlin Aging Study (Helmchen et al., 1996; Klein et al., 1985). Auditive capacity was based on a rating by the trained interviewers (not shown in Table 1). By relying on a questionnaire adopted from the OARS measure (Pfeiffer, 1978) as a proxy measure for “objective” health, no statistically significant differences were found between all study groups with respect to other acute or chronic illnesses. Finally, participants were asked to indicate on a 5-point Likert-type scale (1 = very good; 5 = poor) how they subjectively judged their own health. As expected, this measure revealed a tendency toward a somewhat poorer subjective health rating in both impaired groups.

Procedure

The data collection protocol of this study covered a wide range of person-related as well as environment-related variables, which were collected during two face-to-face interviews and seven phone interviews. For each participant, the days for the seven phone interviews were randomly determined to represent all seven days of the week. All phone interviews were conducted between 6:00 p.m. and 7:00 p.m. and occurred between the first and the second face-to-face interviews. The average time between the face-to-face interviews was 26 days. In this article, only the measures relevant for the testing of the hypotheses outlined earlier are described.

Table 1. Sample Description

<table>
<thead>
<tr>
<th>Variable</th>
<th>Blind</th>
<th></th>
<th></th>
<th>Visually Severely Impaired</th>
<th></th>
<th></th>
<th>Visually Unimpaired</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
<td>Mean</td>
<td>SD</td>
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<td>61-88</td>
<td>76.8</td>
<td>8.1</td>
<td>59-92</td>
<td>74.9</td>
<td>7.3</td>
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<tr>
<td>Education (years)</td>
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<td>1.9</td>
<td>7-16</td>
<td>9.5</td>
<td>1.6</td>
<td>7-14</td>
<td>10.2</td>
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<td>Subjective Vision Impairment (scale 0-15)</td>
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<td>1.1</td>
<td>10-15</td>
<td>12.4</td>
<td>1.9</td>
<td>7-15</td>
<td>0.5</td>
<td>1.1</td>
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<td>Duration of impairment (years)</td>
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<td>2.7</td>
<td>0.3-10</td>
<td>3.0</td>
<td>2.9</td>
<td>0.3-14</td>
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<td>Cognitive status (scale 0-15)</td>
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<td>1.3</td>
<td>10-15</td>
<td>13.3</td>
<td>1.2</td>
<td>10-15</td>
<td>14.0</td>
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<td>Objective” Health” (self-reported illness)</td>
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<td>2.5</td>
<td>0-11</td>
<td>4.0</td>
<td>2.5</td>
<td>1-11</td>
<td>3.1</td>
<td>2.6</td>
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<td>Subjective Health (1 = excellent to 5 = poor)</td>
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<td>1.1</td>
<td>2-5</td>
<td>3.4</td>
<td>1.0</td>
<td>1-5</td>
<td>2.6</td>
<td>1.0</td>
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<td>Gender</td>
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<tr>
<td>Female</td>
<td>71.4</td>
<td>30</td>
<td>71.4</td>
<td>30</td>
<td>71.4</td>
<td>30</td>
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<tr>
<td>Male</td>
<td>28.6</td>
<td>12</td>
<td>28.6</td>
<td>12</td>
<td>28.6</td>
<td>12</td>
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<tr>
<td>Marital Status</td>
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<td>Widowed</td>
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<td>52.4</td>
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<td>45.2</td>
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<td>26.2</td>
<td>11</td>
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<tr>
<td>Other</td>
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<td>4</td>
<td>11.9</td>
<td>5</td>
<td>28.6</td>
<td>12</td>
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<td>Household composition</td>
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<tr>
<td>Living alone</td>
<td>40.5</td>
<td>17</td>
<td>64.3</td>
<td>27</td>
<td>71.4</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not living alone</td>
<td>59.5</td>
<td>25</td>
<td>35.7</td>
<td>15</td>
<td>28.6</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income &gt;DM 2,000</td>
<td>59.5</td>
<td>25</td>
<td>66.7</td>
<td>28</td>
<td>66.7</td>
<td>28</td>
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</tbody>
</table>

*Higher scores indicate higher impairment (scale by Horowitz, Teresi, & Cassels, 1991).
*Higher scores indicate higher cognitive performance (scale by Helmchen et al., 1996; Klein et al., 1985).
*Based on the according scale from the OARS (Pfeiffer, 1978).
Measures

Everyday Competence as Outcome or Predictor.—EC as outcome or predictor was assessed in terms of the participant’s ability to perform basic activities of daily living (ADLs) and more advanced instrumental activities of daily living (IADLs). For this purpose, a 23-item scale developed by Schneekloth and Potthoff (1993) was administered. This scale covers a whole range of basic ADLs such as eating and dressing and IADLs such as meal preparation, medication use, shopping, and banking. Each item was scored on a 3-point scale ranging from “without any help” through “with difficulties” to “only possible with help” and was thus roughly comparable to scales such as the one proposed by Lawton and Brody (1969). The measure of this study is widely used in German survey studies with older adults and has well-established psychometric properties (Wahl & Wetzler, 1998). In this study, the internal consistency reliability (Cronbach’s alpha) was .91 and the two-months test-retest reliability was .86.

Our scale also permits the scoring of different subscores regarding ADL/IADL performance inside the home as follows: (1) basic ADLs within the apartment/house, (2) mobility within the apartment/house, and (3) IADLs within the apartment/house. The internal consistency reliabilities (i.e., Cronbach’s alpha) for the subscales were all greater than .75, and the test-retest reliabilities were all greater than .80.

Everyday Competence as Process.—EC as a process variable was assessed by asking participants about their compensation efforts with respect to every ADL and IADL. Participants’ answers were carefully written down by the interviewers and later coded with respect to the 10 categories shown in Table 2. These categories had been developed based on suggestions by Bäckman and Dixon (1992). Also, a distinction was made between person-related and environment-related modes of compensation. Specifically, we focused on four person-related (more effort or time, use of latent skills, simplification of behavior, and new behavior) as well as six environment-related compensation modes (prosthetics/vision, prosthetics/mobility, prosthetics/other, light, legibility, and structure/order). An example of a person-related mode of compensation would be the use of latent skills such as tactile abilities to compensate for vision loss. An example for an environment-related mode of compensation would be the alteration of light conditions inside the apartment. Coding of participants’ answers was performed with satisfactory interrater reliability (two independent raters, Cohen’s kappa = .74).

Person-Environment Fit.—Each participant’s person-environment fit was assessed by use of a detailed description of his or her home environment. This procedure consisted of standardized questions (e.g., with respect to heating facilities) as well as a so-called “walking-through interview.” Specifically, a partly structured and partly semistructured interview was conducted during a careful walk through all rooms of the participant’s home aimed to identify person-environment problem constellations, for instance with respect to light or floor conditions, as well as other environmental features such as the whole range of equipment in the kitchen and bathroom regarded as critical for daily living by experts in the field (e.g., Pynoos, 1995; Regnier & Pynoos, 1987). These data served as a basis to evaluate the degree of fit or lack of fit between the older adult and his or her home environment by cross-classification of two 5-point ratings (0–4, higher scores indicating better fit), one focusing on the supportiveness, and the other on the safety of the home environment. The more supportive features found in the environment, such as central heating, easily accessible kitchen appliances, or a phone device with enlarged keys, the higher supportiveness was scored. Safety was rated based on the risk for physical injury due to floor (e.g., slippery floor in the bathroom) and/or light conditions (e.g., very low light level around the kitchen stove), or other potentially dangerous environmental aspects (e.g., high bathtub without any handrail). Home environments beyond 2 points on both dimensions were regarded as indication of person-environment fit, whereas lack of fit was defined by all remaining combinations. Assessment of the home environments and the person-environment fit ratings were done after the close of the questionnaire part of data collection by the interviewers, who received for this purpose intensive training done by architectural experts. The interrater reliability for these ratings was .74 (two independent raters, Cohen’s kappa).

<table>
<thead>
<tr>
<th>Table 2: Coding Scheme for Modes of Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Person-Related Compensation Modes</td>
</tr>
<tr>
<td>More Effort or Time</td>
</tr>
<tr>
<td>Use of Latent Skill</td>
</tr>
<tr>
<td>Simplification of Behavior</td>
</tr>
<tr>
<td>New Behavior</td>
</tr>
<tr>
<td>Environment-Related Compensation Modes</td>
</tr>
<tr>
<td>Prosthetics/Vision</td>
</tr>
<tr>
<td>Prosthetics/Mobility</td>
</tr>
<tr>
<td>Prosthetics/Other</td>
</tr>
<tr>
<td>Light</td>
</tr>
<tr>
<td>Legibility</td>
</tr>
<tr>
<td>Structure/Order</td>
</tr>
</tbody>
</table>
Assessment of Action Range.—Information from the phone interviews was used to assess the older adults’ action range outside the home. In particular, during each phone interview, participants were asked whether they had spent time outside their home on the respective day. If the participant responded affirmatively, then he or she was asked to provide information on the exact location of her or his maximum distance away from home. Based on city maps or, in some cases, direct inspection of the outside home environment, distances were coded in terms of eight categories that allowed for higher differentiation within the micro-to-meso-level because the majority of outside behavior was expected in this range (0 = not been outside the home, 1 = up to 50 m, 2 = 50m–100m, 3 = 100m–500m, 4 = 500m–1km, 5 = 1km–5km, 6 = 5km–10km, 7 = 10km–50km, 8 = 50+km; 1m = 3 feet, 1km = 0.6 miles). The intrarater reliability for this rating was .91 (two independent raters, Cohen’s kappa).

This ordinal scaled measure permitted some further distinctions with regard to participants’ action range and the means that they used to move outside their homes. A first category incorporated participants’ maximum action range with and without help, including all modes of mobility. A second category contained participants’ maximum action range without any help, again including all modes of mobility, and a third category considered participants’ maximum action range without any help, but only for mobility by foot.

Results

The presentation of results is organized in accordance with the three main hypotheses of this research project. First, results with respect to an outcome understanding of EC are described. Second, findings with respect to a process view of EC are given, which are followed in a third section by results focusing on the role of EC as a predictor variable.

Everyday Competence as an Outcome of Person-Environment Exchange

With respect to EC as an outcome of person-environment exchange, it had been hypothesized that physical living conditions with a relatively high versus low degree of person-environment fit should play an influencing role in case of the visually impaired but not the visually unimpaired participants.

With respect to the distribution of the person-environment fit rating as done in this study, it was found that only 12 of 42 (about 29%) home environments of the severely visually impaired participants, and only 16 of 42 (about 38%) home environments of the blind participants were rated as high in person-environment fit. Similarly, 14 of 42 (33%) home environments of the visually unimpaired older adults were rated as high in person-environment fit.

Regarding the influence of these different overall standards of physical environment on EC, it should be emphasized that our measure of person-environment fit or lack of fit focused only on the physical environment within the home. Thus, only indicators of EC within the home were included in these analyses. Analyses of covariance were performed with these three subscores of EC as dependent variables and person-environment fit or lack of fit as the independent variable. Selected person variables (sex, age, objective, and subjective health) and selected indicators of the social living situation (living alone vs not alone) were also included as control variables (i.e., covariates).

As shown in Figure 1, no statistically significant effect of the physical environment was observed with regard to basic ADLs, F (1,112) = .08, and mobility within the home, F (1,112) = .10, both ps > .05 (Figures 1A and 1B). However, there was a statistically significant difference in the expected direction in the case of IADLs within the home, F (1,112) = 14.03, p < .01 (R² = .18). Both the severely visually impaired and the blind older adults were significantly better in IADL functioning in living conditions high in person-environment fit than in conditions low in person-environment fit. In contrast, no statistically significant effect of person-environment fit on IADL functioning was found for the visually unimpaired participants (Figure 1C).

Everyday Competence as a Process Aspect of Person-Environment Exchange

This part of the analyses focused on participants’ elaborate compensation efforts in everyday life (see again Table 2). The observed frequency profiles for these compensation modes are shown in Figure 2. It should be noted that 997 compensation events were coded for the blind older adults, 882 for the severely visually impaired older adults, and 225 for the visually unimpaired older adults. This indicates that compensations were most frequent in the group of blind older adults and lowest in the group of the visually unimpaired participants.

With regard to person-related compensation modes, there was a clear tendency in both impaired groups to rely on latent skills such as using the auditory or tactile sense as predominant compensation modes. These compensation efforts were followed by behavioral simplifications, investing more effort or time in conducting activities, and the adoption of new behaviors. With respect to environment-related compensation modes, prosthetics/other was observed most frequently. As may be expected, prosthetics/vision was also observed with high frequency, followed by legibility and prosthetics/mobility. Visually unimpaired older adults most often showed compensations in the domain of general prostheses, but as expected, they were low in all other kinds of compensation modes.

A series of ten ANOVAs, in which the significance level was adjusted based on the Bonferroni rationale to .005, revealed that the mean differences between both groups of visually impaired participants and the visually unimpaired older adults were statistically significant in only a subset of all compensation modes, namely the use of latent skills and behavior simplification (person-related compensations) and prosthetics/vision, light, legibility, and structure/order (environment-
Figure 1. Everyday competence depending on lack of person-environment fit inside the apartment/house for basic ADLs (A), mobility within the house (B), and IADLs within the house (C). Higher scores indicate lower everyday competence.
related compensations). $R^2$ of these statistical tests ranged from .37 (use of latent skills) to .12 (light). In terms of group differences between the blind and the severely visually impaired older adults, only the mean difference for use of the compensation mode of structure/order was statistically significant. Specifically, the blind older adults used this compensation mode more often than the severely visually impaired older adults.

**Everyday Competence as an Antecedent of Person-Environment Exchange**

These analyses used the observed maximum action range outside the apartment/house as an outcome measure with particular importance for the visually impaired participants' person-environment relation outside their homes. The primary aim of these analyses was to predict older adults' action range outside the home using EC as well as a set of additional variables indicative of different environmental challenges as predictors. It was expected that the importance of EC as a predictor would increase as environmental pressure became stronger, that is, in the case of the "no help" conditions. In addition to EC, which was operationalized as ADL/IADL functioning, group membership, age, sex, self-reported illnesses, and social living situation were included in the predictor set.

First, with respect to group differences in the outside action range, Kruskal-Wallis analyses showed that this range was significantly reduced in all three modes of mobility in the severely visually impaired and the blind older adults compared to the visually unimpaired older adults (maximum action range with or without help, all modes of mobility: approx. chi-square $(df = 2) = 23.60, p < .01$; maximum action range, without any help, all modes of mobility: approx. chi-square $(df = 2) = 33.63, p < .01$; maximum action range, without any help and only by foot: approx. chi-square $(df = 2) = 15.90, p < .01$).

In addition, according logistic regression analyses with maximum action range as the dependent variable and the inclusion of both groups of visually impaired persons in order to enhance sample size revealed that EC did play a statistically significant role ($p < .05$) in the case of low environmental challenge but age was revealed as the strongest predictor indicating that participants with a higher age were the ones with a lower maximum action range outside with or without help (see Figure 3A). For this first mode of mobility with or without help, the overall amount of variance accounted for was 21.2%, which was the lowest of all three analyses.

A different set of findings emerged for the "no help" modes of maximum action range outside the home, thus indicating greater environmental challenges for the older adults. As can be seen in Figure 3B, the overall amount of variance accounted for increase in the case of action range outside including all modes of mobility but without external help to 28.8%. EC became the strongest predictor in the model, accounting for 13.6% of overall variance. Greater EC was associated with a greater action range outside the apartment/home. In case of maximum action range outside done only by foot, and again without any external help (see Figure 3C), the overall amount of variance accounted for increased further to 42.4%. EC remained the stron-
Figure 3. Action range outside: Relative importance of everyday competence as a predictor variable. (A) Maximum action outside, with or without help, all modes of mobility. (B) Maximum action range outside, only without help, all modes of mobility. (C) Maximum action range outside, only without help, only mobility by foot. Percentages of explained variance of logistic regressions were calculated based on Christensen (1990) and Goodman (1972). *Household* coded as alone versus not alone. *p < .05; **p < .01; ***p < .001.
gest single predictor variable, contributing 15.8% to the total explained variance. In this third analysis, household also emerged as a strong predictor variable compared with the two previous regressions. With regard to the direction of this influence, older adults living alone tended to have broader outside action ranges as compared with those who did not live alone.

**Discussion**

Using a person-environment framework, the purpose of this article was to contribute to research on the EC of visually impaired older adults. Conceptually, three facets of EC were distinguished and used as a base for empirical analyses. In particularly, EC was conceptualized as an outcome, a process, and an antecedent. Moreover, based on the person-environment view adopted in this study, EC was also seen as a variable that is influenced by conditions of the physical environment and can represent a process as well as an outcome. EC as a process or an outcome may in itself influence the relation of visually impaired persons to their environments.

First, our findings, in part, support the notion that EC as an outcome varies depending on constraining environmental conditions as was stated in hypothesis 1. As was found, the hypothesis holds only in the case of more complex EC functions such as IADLS within the home. A possible explanation for this finding may be that basic ADL functions are critical for independence in physical self-maintenance and may thus mobilize all resources of the visually impaired person to cope with environmental press. This interpretation is consistent with a great deal of research showing that maintaining one’s independence in basic day-to-day activities is an extremely high priority for older adults, thus providing a strong motivational force for activating their reserve capacities, resilience, or hardiness (Staudinger, Marsiske, & P. Baltes, 1993). In contrast, the execution of IADLS leaves a greater degree of freedom without deeply threatening the self and thus may broaden the scope for negative environmental influences.

Second, in visually impaired older adults, EC or the lack thereof may become most visible when we examine it from a process perspective, because such a view focuses on the whole range of compensatory behaviors employed by visually impaired individuals. It reveals that hypothesis 2, in which a stronger compensation tendency of the visually impaired as compared with the unimpaired was stated, also deserves differentiation. As it appears in this study, the use of more effort or time, new behaviors (person-related compensations), and prosthetic devices except the typical low vision aids (environment-related compensations) were not statistically different between the visually impaired and the unimpaired participants. This suggests that these compensations may be more typical for the normal aging process, whereas the pronounced use of latent skills or behavior simplifications (person-related compensations) and the optimization of light conditions, environmental legibility, and the reorganization of the physical environment toward a highly structured and ordered one (environment-related compensations) are characteristic compensations for visually impaired older adults. These findings are also in accordance with the literature on psychological compensation (see Bäckman & Dixon, 1992), in which the intensive use of latent skills, in particular hearing and touch, is described as the predominant compensation mode in sensory-impaired individuals. Furthermore, the results from this study emphasize that older adults, impaired or not, are not only “pawns” but active shapers of their environmental conditions. To be more specific, this study revealed that visually impaired older adults showed a great deal of proactive behaviors. These proactive behaviors focused on minimizing discrepancies between older adults’ capacity profile and challenges posed by particular environmental conditions (Lawton, 1989). Although such compensations were more frequently observed in both impaired groups, the objective severity of the visual loss only showed a weak relation with the profile of compensatory behaviors. Only the compensation category “structure/order” was used more often by the blind older adults compared with the severely visually impaired older adults. This finding underscores the adaptational importance of a stable home environment for this specific group, which has almost completely lost any visual relationship with the physical environment.

Third, the findings of this research also emphasize that EC can play the role of an antecedent, resulting in different consequences depending on the level of “environmental press” affecting the visually impaired older adult. As was expected in hypothesis 3, EC emerged as the most important predictor variable only in those instances in which environmental challenge was high, that is, in situations where external help was not available. In addition, the household situation—living alone versus living not alone—reached statistical significance in situations that posed high environmental challenges. Findings from this study suggest that visually impaired older adults who live alone may be more successful at maintaining their action range outside the home than visually impaired older adults who do not live alone. Older adults who live alone probably have learned to be more independent, because often they may have lived alone for an extended period of time. Unfortunately, we did not gather information on how long our participants lived alone and would thus recommend for future research in this field that this information be included in the data collection set.

Although the data of this study support our hypotheses as well as lead to some important and interpretable differentiations, further limitations of the study should be kept in mind. First, the relatively small sample size needs replication to strengthen the robustness of our results. In particular, the statistical power of our sample size as a base to apply logistic regression techniques clearly is limited. Second, the collection of person, environmental, and person-environment fit data by the same interviewers may have led to some confoundings. For example, interviewers faced with very active and engaged elderly adults may have been tempted to rate objective environmental aspects and
thus person-environment fit more positively as compared with interviewers interacting with more passive older adults. Thus, we would recommend always using different interviewers/raters in future research based on a person-environment framework.

Finally, and with these limitations of our study in mind, we would like to argue that a person-environment perspective is a greatly needed and very promising approach to the study of EC in visually impaired older adults. Specifically, a person-environment perspective can contribute to the existing body of knowledge by conceptualizing EC in multiple complementary ways: as outcome, process, or antecedent condition. Such a multidimensional approach is not only promising with regard to research but also has the potential to inform practitioners in applied areas of gerontology. In particular, practitioners who design training programs for visually impaired older adults may become more motivated to adopt a truly transactional perspective in their intervention efforts (Parmelee & Lawton, 1990). Such a transactional perspective does not focus unilaterally on the visually impaired person or the physical environment, but emphasizes the reciprocal relatedness of and the transactions between person and environment. We suggest that such a perspective can not only further the research on EC in visually impaired older adults, but that it can also inform research on EC in frail older adults in general.

References


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