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The effects of environmental context and personal resources on depressive symptomatology in older age: a test of the Lawton model

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ABSTRACT

This study examines the environmental and psychosocial determinants of depression in older adults. Based on Lawton's environmental docility thesis, the question is posed: is the strong association between functional limitations and depressive symptomatology affected when environmental conditions, objective and subjective efficacy, and docile or proactive behaviour are taken into account. Data were used from LASA (the Longitudinal Aging Study Amsterdam), a national survey of the population between 55 and 85 years of age, stratified by age and sex. Hierarchical regression analyses were performed on the data of 2,981 respondents. Empirical support was found for the extended Lawton model, including both environmental, efficacy and behavioural factors. In particular, living in a more urbanised area, not being able to perform heavy household tasks, having a low self-efficacy, not feeling safe, receiving help from others and having few social contacts within the neighbourhood, increase depressive symptoms in general but, in particular, when combined with lower functional status. It is concluded that both *being* able and *feeling* able to influence one's environment increases proactive behaviour and decreases depressive symptomatology in older adults with low functional status.

KEY WORDS – elderly, depression, environment, functional status.

Introduction

Social factors have often been demonstrated to be strong predictors of health in the older population. George (1996), for example, recently provided a systematic review of the research on social factors in relation

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to illness. She discusses six classes of social factors: demographic variables, social status, social integration, social stress, social support and coping/psychological resources. Unfortunately, however, George includes neither objective nor subjective environmental factors as important determinants of illnesses, although in a number of studies these have been proposed (*e.g.* Lawton and Nahemow 1973, Kahana 1982).

La Gory and Fitzpatrick (1992) identified older people as a 'unique set of ecological actors' and suggest at least two distinctive features. On the one hand, as Stea (1970) stated, the local action environment becomes constricted with old age. Role loss, reduced income, widowhood and decreased physical capacities limit the activity space of older people and make the proximate environment more important. On the other hand, older people become more sensitive to social as well as physical environmental factors.

Earlier studies show that the social composition of the neighbourhood is related to the number of social relationships that people have. Rosow (1967) demonstrated that the higher the proportion of people aged 65 and over in the neighbourhood the more relationships older people have, while Blau (1961) demonstrated a similar process among older widows. Physical environmental factors, for example the design of houses and the accessibility of dwellings, play a primary role in the mobility opportunities for the older adult, while the availability of resources in the near environment (shops, services, transport) may affect the opportunities for independent lifestyles. Consequently, older people experiencing a decrease in competence may need environmental adaptation in order to cope with behavioural limitations.

As a result of a possible misfit between personal competence and environmental demands there may be an increased risk of depressive symptomatology (*c.f.* Lawton 1980, 1983). Late-life depression has often been related to the disadvantages of growing old, i.e. a decrease in functional status and a lack of other social and financial resources. From several studies it appears that difficulties with activities of daily living (ADL) are consistently predictive of depressive symptoms among older persons (Beekman *et al.* 1995; Kinzie *et al.* 1986; Kennedy *et al.* 1989). Yet, despite the growing awareness of the importance of environmental perspectives in ageing studies, La Gory and Fitzpatrick recently noted that: 'very little research has given consideration to the impact of environmental factors, other than social networks or supports, on depressive symptomatology' (1992: 460).

In the present study we intend to explore the environmental and psychosocial determinants of depression. Our research is based on the

Figure 1. The adapted extended ecological model of Lawton.

theoretical framework of Lawton (1980, 1989*a*, 1989*b*). In order to clarify the person-environment interaction in old age, Lawton introduced the environmental docility hypothesis. Until now, empirical research on his model and related issues has been limited. His ideas are elaborated below, followed by specific hypotheses to be tested in this study.

Theoretical framework

The focus of the original model (Lawton and Nahemow 1973; Lawton 1980) is on the mechanisms by which transactions between the person and the environment occur, especially among older persons. Such transactions are based on a specific fit between capacities of the person and the more or less demanding characteristics of the environment. Older people with a decreased competence in ADL may experience a need to adapt their behaviour to the level of the environmental press. This adaptive behaviour is expected to promote subjective well-being. Inversely, environmental changes lowering the level of environmental press may facilitate coping with decreased ADL capacities. This interactive mechanism between personal competence and environ-

mental demands, the 'environmental docility hypothesis', has become an important tool in environmental planning activities for functionally dependent older people. However, this model stresses the passive environment-dependent role of the older adult, and neglects the needs and preferences of the person involved (Carp 1984). In relation to Lawton's model it is argued that the environment not only raises demands but in many cases also offers resources and opportunities. These may challenge people to develop new ways of autonomous behaviour and initiate proactively environmental changes. In response to the criticism of his model, Lawton (1989*a*, 1989*b*) elaborated his original model with the concept of 'efficacy', a concept indicating whether the relationship between person and environment was effectively managed (Figure 1). This efficacy, and the subjective experience of being efficacious, are considered to mediate person-environment transactions. This means that, given a certain level of efficacy, those people who take an active stance will show proactive person-environment behaviour, while those who take a passive stance will show docile person-environment behaviour and will become constrained by environmental demands.

Hypotheses

The main thesis in this study concerns the person-environment interaction and its relevance for depressive symptomatology. As was stated in the original environmental docility hypothesis, those people who are not able to manage an adequate fit between personal competence and the level of environmental demands, run the risk of developing inadequate behaviour (too ambitious or too passive) and a depressive outcome. Our first hypothesis is that there is an independent positive impact of objective environmental characteristics on depressive symptoms, and an interaction effect between functional competence and environmental variables in their impact on depressive symptoms.

According to the extended Lawton model, objective and subjective efficacy should be important mediators between personal competence and environmental demands/resources and depressive symptomatology. Objective efficacy reflects the way an individual with a certain level of competence deals with environmental press or uses environmental resources. Subjective efficacy indicates individuals' expectation of being successful in dealing with environmental challenges. Our second hypothesis, therefore, states that, given a significant

association between functional competence and environmental characteristics on the one hand and depression on the other, objective and subjective efficacy will have an additional impact on depression.

Lawton's enlarged model implies also specific behavioural outcomes. On the one hand, low objective and subjective efficacy are expected to promote docile person-environment transactions, *i.e.* behaviour that is determined by environmental and individual constrictions. Those older people who demonstrate a high level of person-environment docility may take functional competence restrictions and/or environmental demands as an excuse for not maintaining social relationships. Thus, low levels of objective and subjective efficacy may be important predictors of level of interaction within the neighbourhood. In the same way, low levels of objective and subjective efficacy may lead impaired people to show a need for care and in this way may involve caregivers. On the other hand, high objective and subjective efficacy are expected to promote proactive behaviour demonstrating a change orientation. Those who demonstrate a high level of environmental proactivity may take individual competence restrictions and environmental resources as challenges; for example, to look for new relationships and memberships of organisations. That is why we hypothesise, thirdly, that both objective and subjective efficacy will be important predictors of the search for new relationships and for the receipt of formal or informal care, which in turn are related to depressive symptomatology. In general, we expect more proactive behaviour among those with higher objective and subjective efficacy.

Method

Sample

To test our hypotheses we used data from the *Longitudinal Aging Study Amsterdam* (LASA, Deeg *et al.* 1993, Deeg and Westendorp 1994). The sample for this study was originally recruited in 1992 for the NESTOR study '*Living Arrangements and Social Networks of Older Adults*' (abbreviated to LSN; Knipscheer *et al.* 1995; Broese van Groenou *et al.* 1995). The LSN survey was based on a stratified random sample of men and women born between 1908 and 1937. It was drawn from the population registers of eleven municipalities in three regions in the Netherlands that represent differences in culture, religion, urbanisation and ageing. The response rate was 62.3 per cent. About one year later (on average) the 3,805 respondents were asked to

participate in the LASA study. Face-to-face interviews were conducted in 1992 and 1993 with 3,107 respondents. The response rate was 81.7 per cent. The face-to-face interviews included topics such as basic demographics, subjective and functional health status, personal network, living arrangements and wellbeing. In this article we confine ourselves to those respondents born between 1908 and 1937 who were not living in an institution, and for whom no data were missing regarding health status and personal network. This applies to 2,712 persons. Of these, 51 per cent were female and 68 per cent were in a partner relationship. The average age of the respondents was 70.3 years ($SD = 8.6$) ranging from 55 to 85 years of age. Their level of education, indicated in number of years, averaged 8.9 years ($SD = 3.3$) ranging from 5 to 18 years.

Measurements

As an indicator of personal competence we used *functional limitations*. Respondents were asked whether they were able to perform the following activities 'without difficulty', 'with difficulty', 'only with help' or 'not at all': 1) walking up and down a staircase without stopping, 2) using their own or public transportation, and 3) cutting their own toenails. The total score ranged from 0 (no items without difficulty) to 3 (no items with difficulty). About 61 per cent of the respondents obtained the maximum score, indicating a good functional status. Nearly nine per cent of the respondents performed all three activities with difficulty, indicating a poor functional status.

Several characteristics of the *objective environment* were used. The first was the *degree of urbanisation* of the municipality in which the respondent resided, indicated by the mean number of addresses per square kilometre within a circle with a radius of one kilometre. After recoding, the range was one to five: no urbanisation (less than 500 addresses), little (500–1000), somewhat (1000–1500), highly (1500–2500) and very highly urbanised (more than 2500). A second indicator was whether or not *adjustments* were made in the home, varying from a special telephone, lowered doorstep, to a raised bed and adjusted toilet. Of the respondents 21 per cent reported that one or more adjustments were made in their home, while 69 per cent reported no adjustments. Thirdly, we used *the proportion of persons aged 65 years or older in their neighbourhood*. This information is available from the Central Bureau of Statistics in the Netherlands and can be attached to the postal code of each respondent. The proportion of older adults in the neighbourhood varied from three to 39 per cent, and was on average 17 per cent.

Objective efficacy reflects how actively an individual with a certain level of competence deals with environmental press or uses environmental resources. This management of the environment is assumed to reflect the performance of activities that others may have chosen not to perform or to cease performing, such as the activities associated with heavy household tasks. In performing such activities one demonstrates the ability but also the willingness to take care of one's household. Information about whether respondents did or did not perform *heavy household tasks* themselves is used as the indicator of objective efficacy, and 71 per cent answered positively.

Subjective efficacy is reflected in a positive attitude towards life in general and one's environment in specific. Two indicators were used: the degree of *general self-efficacy*, and whether the respondent felt *safe in one's own neighbourhood*. The degree of general self-efficacy was measured by the ALCOS-scale, a scale adapted from the General Self-Efficacy Scale from Sherer *et al.* (1982). The translated scale comprises 12 Likert-scale items regarding the expectation people have towards their capacities in general. The ALCOS-scale was used in two large surveys of Dutch older adults, and the reliability and construct validity appeared to be good (Bosscher *et al.* 1997). A high score indicates that one is willing to initiate behaviour, to expand effort in completing behaviour and show persistence in the face of obstacles. The sample used in this article had an average scale score of 41.9 (SD = 5.3, range 14–60). Respondents were asked: 'Do you feel safe in your neighbourhood?' and 79 per cent answered 'yes'.

In order to indicate *docile behaviour* we used the information about whether or not the person received *help from either formal or informal sources* in personal care and/or household tasks. The receipt of help with these tasks is considered to indicate a lower degree of autonomy and a more passive stance towards one's environment. In our sample 51 per cent of the respondents received help with either personal care or household tasks. With respect to *proactive environmental behaviour*, it is assumed that greater involvement in the objective environment reflects an active stance towards life in general and social contacts in particular. Specifically, involvement in the local community, and more precisely in one's neighbourhood, should reflect an active social attitude. Two indicators were used: *the proportion of network members living within the neighbourhood (i.e. within 15 minutes travelling time)* and *the number of voluntary organisations* that the respondent participated in. The network identification procedure used is described elsewhere (Van Tilburg 1994, 1995). The proportion of network members living within the neighbourhood was on average 63 per cent (SD = 27.5, range 0–100

per cent). The average number of voluntary organisations respondents participated in was 1.2 (SD = 1.3, range 0–9).

As a measurement of *depressive symptomatology*, the CES-D was used (Radloff 1977), a 20-item scale with a total score ranging from 0 to 60. Scale properties are good: Cronbach's alpha is .87. On average the respondents reported a *depressive symptomatology* of 7.5 scale points (SD = 7.5, range 0–54).

Basic information on the mean, standard deviation and range about all variables used is listed in Table 1.

Procedure

The focus of interest is on the degree to which the extended Lawton model (as shown in Figure 1) is an improvement on the simple model that includes only functional status, environmental factors and depression. Our analysis addresses the question: does the relationship between functional status and depression remain when variables concerning the environment, efficacy and behaviour are included stepwise in the model. The three hypotheses we formulated are tested with hierarchical linear regression analysis. Interaction effects between functional status and the other independent variables are also examined. The interaction terms were computed by multiplying the centred values of the two variables. In the first step of the regression analysis the simple model was tested: control variables were included (sex, age, partner status, and years of education), as well as functional status, the environmental factors and the interaction terms (testing hypothesis 1, Model 1 in Table 2). The second step involved the addition of objective efficacy (performing heavy household activities) and subjective efficacy (self-efficacy and feeling safe) and the interaction terms with functional status (testing hypothesis 2, Model 2 in Table 2). In the third and final step the indicators of docile and proactive behaviour (receiving help, neighbourhood network and participation in organisations) were included in the analysis (thereby testing hypothesis 3, Model 3 in Table 2).

To examine the interaction between functional status and environmental factors, regression analysis was conducted separately for the respondents with high functional status (no difficulties at all), and for those who experience difficulties in performing one or more functional activities.

Using linear regression analysis makes it possible for us to examine the direct effects of all factors on depression, but it does not take the correlations between the factors into account. Yet, a crucial element of

TABLE 1. *Measurements*

Theoretical concept	Variable	Codes	Mean	SD	Range
Functional limitations	1 Sex	1 Male	1.5	0.5	1–2
		2 Female			
	2 Age	Years	69.9	8.6	54–85
	3 Partner	0 No partner	0.7	0.5	0–1
		1 Partner			
Objective environment	4 Education	Years	8.9	3.3	5–18
	5 ADL	0 No items without difficulty	2.6	0.9	0–3
		3 No items with difficulty			
Objective efficacy	6 Urbanisation	1 No urbanisation	2.9	1.5	1–5
		5 Very highly urbanised			
	7 % 65+	%	17.5	6.6	3–39
Subjective efficacy	8 Adjustments	Number of adjustments to the home	0.5	1.3	0–12
	9 Heavy household	1 Did not perform heavy household tasks	1.7	0.5	1–2
		2 Did perform tasks			
Docile behaviour	10 General self-efficacy	A high score: willing to initiate behaviour	41.9	5.2	14–60
	11 Feeling safe	0 Does not feel safe in one's neighbourhood	0.8	0.4	0–1
		1 Does feel safe			
Proactive behaviour	12 In/formal help	0 Does not receive help	0.5	0.5	0–1
		1 Does receive help			
	13 % of network members living in neighbourhood	%	62.6	27.5	0–100
Depressive symptomatology	14 Voluntary organisations	No. of organisations participates in	1.2	1.3	0–9
	15 CES-D	A higher score: more depressed	7.5	7.5	0–54

the Lawton model is, for example, that proactive behaviour is determined by efficacy as well as by functional status and environmental context. Nor do we get with linear regression models a clear picture of the indirect effects of functional status on depression. Taking this into consideration, we re-tested hypothesis 3 in a LISREL-model that included all background variables and theoretically relevant effects between all factors as shown in Figure 1. The interpretation of the results of the LISREL analysis focuses on the direct and indirect effect of functional status on depression.

Results

Functional status, environment and depression

The results of the stepwise regression analyses are shown in Table 2. The test of the simple model (hypothesis 1) is represented in Model 1. It shows that fewer functional abilities ($\beta = -.28$) and living in a more urbanised area ($\beta = .14$) increases the risk on depressive symptoms, given the impact of the background characteristics on depression. Moreover, an interaction effect between functional status and urbanisation was found ($\beta = -.04$), indicating that a lower functional status and living in a largely urbanised area increases the risk on depression even more than the impact of both factors taken separately. The other two environmental factors appear to be not significantly associated with depression.

Objective and subjective efficacy

In the next step indicators of objective and subjective efficacy were introduced in the regression model (Model 2). The inclusion of these variables increases the proportion of explained variance by 6 per cent. The results show that the more one performs heavy household activities, the less depressed one is ($\beta = -.07$). An interaction effect was found between functional status and heavy household activities on depression ($\beta = .06$), indicating that, given fewer functional abilities, depressive mood is decreased when one is still doing heavy household activities oneself. The two aspects of subjective efficacy (being self-efficacious and feeling safe in the neighbourhood) contribute significantly to lower depression. In particular, feeling in control of one's life (self-efficacy) is very important for decreasing depressive symptoms – as can be concluded from the large beta-coefficient ($\beta = -.23$). Also,

TABLE 2. Stepwise multiple regression on depressive symptomatology

	Model 1 β	Model 2 β	Model 3 β
Sex	.07**	.04*	.04*
Age	-.07**	-.10**	-.11**
Partner	-.14**	-.13**	-.12**
Education	-.06**	-.02	-.03
ADL	-.28**	-.20**	-.19**
Urbanisation	.14**	.11**	.09**
% 65+	.02	.01	.01
Adjustments	.03	.02	.02
ADL $\times$ urbanisation	-.04*	-.04*	-.04*
Heavy household (hh)		-.07**	-.06**
General self-efficacy		-.23**	-.23**
Feeling safe		-.10**	-.09**
ADL $\times$ hh		.06**	.06**
ADL $\times$ safe		-.04*	-.04*
In/formal help			.04*
% network in neighbourhood			-.06**
Voluntary organisations			-.04*
adj. R^2	16.6%	23.0%	23.5%
F	60.88	58.8	49.9
d.f.	(9, 2696)	(14, 2691)	(17, 2688)

* $p < .05$; ** $p < .01$.

a significant interaction effect was found between functional status and feeling safe. Both aspects contribute significantly to depression, but the combination of a lower functional status and not feeling safe in the neighbourhood significantly increases depressive feelings ($\beta = -.04$).

The docility hypothesis

Inclusion of the indicators of docile and proactive behaviour in the third step of the multiple regression analysis on depression (Table 2, Model 3) showed that depression is associated with receiving more help ($\beta = .04$), having less contacts in the neighbourhood ($\beta = -.06$) and being less active in voluntary organisations ($\beta = -.04$). So, taking all other effects into account, more docile and less proactive behaviour significantly increases depressive mood. It should be noted however, that the regression coefficients are rather small and that the change in R^2 in Model 3 is only 0.5 per cent. Functional status remains strongly associated with depression ($\beta = -.19$) when all other variables are taken into account. Given the significance of interaction terms with urbanisation, heavy household performance and feeling safe, the effect

TABLE 3. *Regression analysis on depression for older adults with and without limitations in performing functional activities*

	Functional limitations (n = 1018)	No functional limitations (n = 1686)
	β	β
Sex	.03	.06*
Age	-.14**	-.08**
Partner	-.13**	-.13**
Education	-.08**	-.00
Urbanisation	.12**	.06*
Adjustments	.03	.02
% 65+ in neighbourhood	.00	.04
Heavy household	-.13**	-.02
General self-efficacy	-.24**	-.24**
Feeling safe	-.09**	-.10**
In/formal help	.11**	.01
% network in neighbourhood	-.09**	-.03
Voluntary organisations	-.03	-.05*
Adj. R ²	18.7%	13%
d.f.	(13, 1005)	(13, 1673)

* p < .05; ** p < .01.

of functional status on depression appears to be in part indirect. The testing of direct and indirect effects requires the testing of a structural linear model, as described below.

Comparing respondents with high and low functional status

The significant interaction terms (shown in all models in Table 2) indicate that the association between urbanisation, feeling safe and heavy household tasks on the one hand and depression on the other, differs for respondents with lower and higher functional status. In order to interpret these interaction terms, regression analysis was performed separately for two sub-groups: the respondents with high functional status (all three activities are performed without difficulty) and those with lower functional status (at least one activity is performed with difficulty). The results in Table 3 indicate that different sets of predictors of depression were found in the two groups. The results indicate that living in an urbanised area increases the risk of depressive symptoms, but in particular when one's functional status is low ($\beta = .12$ for the lower status group and $\beta = .06$ for the high status group). Performing heavy household tasks appears only relevant for depression when one's functional status is low ($\beta = -.13$ in low status group and

$\beta = -.02$ in the high status group). Feeling safe is associated with depression to the same degree in both groups of older adults ($\beta = -.09$ and $\beta = -.10$ respectively), which does not bring any further understanding of the interaction effect of functional status and feeling safe shown in Table 2. Further examination within the group with lower status showed that feeling unsafe is particularly important for older adults who have the lowest functional status, those unable to perform any functional activity without difficulty.

The extended Lawton model (Model 3) is corroborated in both groups but in particular for respondents with lower functional status compared to those with high functional status, as suggested by the difference in the proportion of explained variance ($R^2 = 18.7$ per cent and 13 per cent respectively). It can be concluded that environmental factors, subjective efficacy, and more docile and less proactive behaviour, all increase the risk for depressive symptoms in old age. In addition, it can be concluded that a lack of objective efficacy (*i.e.* performing household activities), showing more docile behaviour (*i.e.* receiving help) and little involvement in the neighbourhood network, contribute to depression only among older persons with lower functional status.

The full model re-tested

The LISREL analysis showed that a good fit of the model is obtained when a large number of effects between the factors are included. The significant direct effects between all factors are illustrated by the beta and gamma coefficients in Table A1 (Appendix). In Figure 2 the most important effects are presented. For reasons of presentation, only significant effects of theoretical interest are included in this Figure. All estimates are included in the Appendix. The fit of the model is good. The results show that depression is the result of a lower functional status ($\beta = -.22$), in particular when living in a largely urbanised area ($\beta = .08$), feeling less safe in the environment ($\beta = -.10$) and performing fewer activities in the household ($\beta = -.07$), in addition to feeling less self-efficient ($\beta = -.23$), maintaining fewer contacts in the neighbourhood ($\beta = -.05$), being less active in organisations ($\beta = -.04$), as well as receiving more help from formal or informal others ($\beta = .04$). Most of these effects are direct. Only with respect to functional status and urbanisation is the effect on depression partly routed via other factors. For functional status, this route is via not being able to perform heavy household activities and receiving more help from others (indirect effect is $-.09$). For urbanisation it was found that living in

Figure 2. LISREL estimates of the extended Lawton model.

largely urbanised areas contributes to depressive symptoms caused by lower levels of social participation in neighbourhood and voluntary organisation (indirect effect is .05).

The relation between objective efficacy and docile/proactive behaviour received empirical support. The LISREL estimates shown in the Appendix indicate that doing heavy household activities (objective efficacy) decreases the chances on receiving help from others ($\beta = -.23$), decreases the number of contacts in the neighbourhood ($\beta = -.04$) and increases the number of voluntary organisations in which one participates. The association between subjective efficacy and docile/proactive behaviour is less strong. Self-efficacy is only related to being more active in organisations ($\beta = .04$), feeling safe is related to receiving less help ($\beta = -.04$), and having more contacts in the neighbourhood ($\beta = .09$). These results support the general notion that being efficacious contributes to less docile and to more proactive behaviour.

Strong and direct effects remain between the background characteristics and depressive symptoms (see the gamma coefficients in the Appendix). Despite all the other effects on depression, being female, being younger and living without a partner, also contribute to feeling depressed. The effect of age on depression is the reverse to what is often

expected (*i.e.* the older, the more depressed). The zero-order correlation between age and depression is indeed positive ($r = .10$). The negative direct effect of age in the multivariate regression and LISREL analysis is due to the strong relation between age and other variables such as functional status, partner status, performing heavy household tasks and receiving help.

Two major conclusions can be drawn from the results of the LISREL model. The first is that functional status and depressive affect remain strongly and negatively related, despite the direct effects of functional status on most of the other factors included in the model. Also, the model has shown the importance attached to the degree of urbanisation of the living environment of the older adult. The environmental aspect has shown its value in this model, in the sense that a low functional status is associated with fewer depressive symptoms in people living in a rural area compared to living in a largely urban area.

The second conclusion is that the inclusion of objective and subjective efficacy in the explanation of depressive symptoms proved to be fruitful. Being able to influence your own environment (as is the case, for example, in still doing your own heavy household activities) and, in particular, feeling that you are able actively to manage your environment, and that you are safe in the neighbourhood, decreases the depressive effect of having a low functional status.

Discussion

Environmental issues have been neglected in epidemiological studies of independent functioning and depression in old age. Despite the general awareness of the issue, empirical testing has remained rare. In this study it has been shown that environmental characteristics and personal resources add to our understanding of depressive symptomatology.

The multivariate analyses have consistently shown that environmental characteristics appear to have an impact on depressive symptomatology. Our analysis is an important confirmation of the original environmental docility thesis. Living in a more urbanised area by itself does increase depressive mood among older people. A more urbanised area is associated with more complicated housing facilities (*e.g.* flats with and without elevators, maintenance services), a higher risk of robbery, and complex traffic situations. Such a living environment, moreover, is more unfavourable for functionally impaired

people. The other two environmental aspects, the proportion of older people in the neighbourhood and adjustments in the house, do not appear to have an important impact on depressive symptomatology. This finding is surprising because the environmental docility hypothesis has been the theoretical legitimation for policies for the adaptation of housing conditions and for related activities promoting the well-being of ADL-handicapped older people (Lawton 1980, 1989*b*).

The study also tested whether a proactive orientation implies an active way of dealing with behavioural limitations, controlling for impaired functional capacity, environmental conditions and its interactions. Given a certain amount of functional impairment and specific unfavourable environmental conditions, a proactive orientation, subjectively but in particular objectively, prevents depressive symptoms to a certain extent (Table 2, Model 2). Depression is less a result of objective conditions than is implied by the original environmental docility hypothesis. The evidence suggests that some people at least can do something to reduce depression in some situations. This finding fits well with the liberating model of adult development: 'Adult development is thus not merely a product of biology and social adaptation, but also involves individual choice and personal commitment to change' (Levenson and Crumpler 1996: 146).

Lawton's enlarged model also suggests specific behavioural outcomes. High objective and subjective efficacy contributes partly to a lower level of depressive symptomatology via the promotion of a proactive style of behaviour. In addition, low objective and subjective efficacy was found to promote docile behaviour. Although introducing the behavioural measures in the regression model does not add explained variance, the regression coefficients appear to be significant (Table 2, Model 3). The comparison of the regression equations of respondents with and without functional limitations (Table 3), adds to our further understanding of person-environment interaction. Given a lower functional status, it is important for individuals to retain a sense of independent and social functioning – as indicated by performing heavy household activities themselves, by not receiving help from others with activities of daily living, and by being involved in the neighbourhood network.

The LISREL analysis provides a more complete evaluation of the contribution of the enlarged model of Lawton. The important direct contributions of functional capacity and urbanisation on depressive symptomatology remain. Interestingly, it shows that objective and subjective efficacy play important mediating roles. The direct effect of impaired functional capacity on depressive symptoms remains con-

siderable, but the indirect effect, through objective (performing heavy household tasks yourself) and subjective self-efficacy, significantly decreases its direct impact on depression. It shows that a proactive stance is efficient not only in coping with disadvantaged conditions, but also in preventing depression. In addition, these outcomes of a proactive stance seem to work partly through specific behavioural tendencies. First, those who demonstrate a proactive stance (subjective as well as objective) are more likely to be active members of more organisations. Secondly, those who are more efficient in heavy household tasks mobilise less outside help, and have a lower proportion of their social network within the neighbourhood. The LISREL model also gives some indication of the impact of urbanisation on depression. It appears that impaired older people in urban areas compared to those in rural areas have a lower proportion of their social network within the neighbourhood and a lower number of active memberships. Social life in urban areas seems to be more limited than in rural areas.

Although we were able to confirm our three hypotheses, we are aware of some limitations of our study. The data used were not collected to test Lawton's models and, as a result, the operationalisation of the theoretical concepts was limited in certain ways. First, insofar as objective efficacy indicates the ability to deal with environmental demands, we considered that those who were functionally limited to a certain extent but who nevertheless were still performing heavy household tasks, as demonstrating objective efficacy. Secondly, taking 'receiving help in household and personal care' as an indication of docility, we ran an even greater risk of overstressing the proactive perspective, suggesting that their eagerness to obtain help from others entailed showing themselves to be victims of their environmental conditions. Nevertheless, this interpretation is corroborated by the finding that older adults with low functional status are less depressed when they are still doing heavy household activities themselves.

The original environmental docility hypothesis has often been considered as having important implications for intervention. The suggestion is that, given functional impairment, environmental adaptation by itself would promote the ability to cope effectively. Our study has demonstrated that effective coping needs environmental as well as cognitive interventions.

Appendix

TABLE A1. Direct effects of all variables in the LISREL model, beta and gamma coefficients significant at $p \leq .05$

	1	2	3	4	5	6	7	8	9	10	11
	β -coefficients										
1. Functional limitations											
2. Urbanisation	-.05										
3. % 65+		.27									
4. Adjustments in home	-.26										
5. Heavy household	.35			-.08							
6. Self-efficacy	.16										
7. Feeling safe	.09	-.29		-.05		.05					
8. In/formal help	-.16	-.14		.08	-.23		-.04				
9. % network in neighborhood		-.24			-.04		.09				
10. Voluntary organisations	.04	-.27	.07		.07	.06		.06	.08		
11. Depression	-.22	.08			-.07	-.23	-.10	.04	-.05	-.04	
	γ -coefficients										
Sex	-.11				.06	-.08	-.17	-.05		.05	.05
Age	-.35	.07	.08	.08	-.14	-.08	-.09	.11	-.08		-.11
Partner	.12	-.08					.04		.10		-.12
Education	.09	.14			-.10	.16	.05	.11	-.15	.10	

Chi 2 = 42.0, d.f. = 36, $p = 0.23$, RMR = 0.01, AGFI = 0.99

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