

CHAPTER 3

Creating and Sustaining Homelike Places in Residential Environments

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EDITORS' INTRODUCTION

Adopting a strongly psychological perspective, Oswald and Wahl focus data from the European Enabling Autonomy, Participation, and Well-Being in Old Age: The Home Environment as a Determinant for Healthy Ageing (ENABLE-AGE) project, they document how these themes are related to older people's autonomy and well-being. The chapter introduces a developmental perspective on environmental experience in later life by suggesting that the evolution of the person-environment relationship is related to the task of remaining independent for as long as possible as well as maintaining one's integrity and identity. This task is manifest through the individual's ability to control their environmental use (agency) and their ability to make meaning (belonging) through the creation and re-creation of homelike places. The data confirm that an understanding of both belonging and agency is important in interpreting the effectiveness of barrier-free building standards. But, beyond this, Oswald and Wahl's work reveals the potential for reliably assessing both the individual's sense of belonging and agency and the way these determinants of environmental experience evolve over time. The perspective presented on the process of person-environment adaptation provides for an expanded perspective on developmental theories that have conspicuously lacked an environmental component. In addition, the quest for understanding the way in which belonging and agency are manifest every day in older people's lives, and how they change as they move into advanced old age, has important implications for facilitating environmental design that embraces both subjective and objective elements of experience.

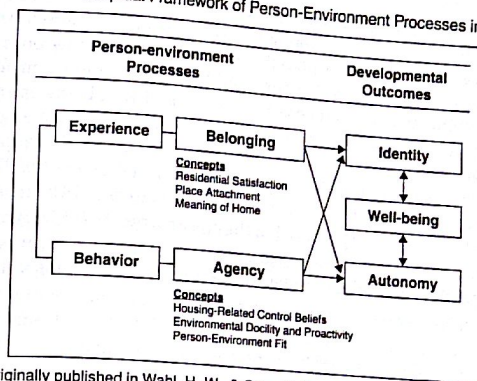
Creating and sustaining homelike places is a developmental task for people across the lifespan. Better understanding of the person-environment (P-E) processes involved in this long-term developmental challenge has been, and continues to be, a major theme in aging research, particularly in social gerontology and the psychology of aging. That said, the aim of this chapter is to present our view of P-E interchange processes and their outcomes in the immediate home environment in later life. We first introduce a conceptual framework that refers to two key processes of P-E interchange in later life, which we have coined in our previous work as *belonging* and *agency* (Wahl & Oswald, 2010). Second, we draw on a selection of cross-sectional and longitudinal data from the European project ENABLE-AGE (in which both authors were participants) to support the notion that both processes capture significant portions of the psychological makeup of people's lived experience of housing in later life. Belonging and agency are also strongly related to key elements of the "good life" (Lawton, 1983) in old age, including autonomy and subjective well-being. The empirical findings presented in this chapter have been generated in collaboration with fellow researchers from the ENABLE-AGE consortium (see Chapter 8) (Iwarsson et al., 2007; Nygren et al., 2007; Oswald et al., 2007; Wahl, Oswald, Schilling, & Iwarsson, 2009).

TOWARD AN INTEGRATIVE THEORETICAL FRAMEWORK FOR HOUSING IN LATER LIFE

Human development is characterized by P-E exchange processes (Bronfenbrenner, 1999) involving subjective experiences as well as objective behavior. In order to address the complexity of aging in place, a conceptual framework is suggested that emphasizes two processes of P-E exchange in later life—*belonging* and *agency* (see Figure 3.1). In our view, the two constructs are particularly useful for integrating theoretical approaches offered in environmental gerontology in recent years (Oswald & Wahl, 2004; 2005; Scheidt & Windley, 2006; Wahl, 2001; Wahl, Iwarsson, & Oswald, 2012; Wahl & Lang, 2004, 2006; Wahl & Oswald, 2010; Wahl, Scheidt, & Windley, 2004).

In the framework outlined in Wahl and Oswald (2010), "processes of belonging" incorporate various facets of P-E experience, while "processes of agency" emphasize goal-directed P-E cognitions and behavior. As people have experienced life-long bonding to certain places, "processes of belonging" reflect environmental experience, subjective evaluation, interpretation of places, how meaning is made, as well as emotional bonding and place attachment. One key aspect of P-E

FIGURE 3.1 Conceptual Framework of Person-Environment Processes in Later Life



Note. Originally published in Wahl, H.-W., & Oswald, F. (2010). Environmental perspectives on ageing. In D. Dannefer & C. Phillipson (Eds.), *International handbook of social gerontology* (pp. 111–124). London: Sage.

belonging is the individual's cognitive orientation toward his or her own environmental past, present, and future, which may find expression as home-related reminiscence or in discussion of housing plans.

By contrast, "processes of agency" concern physical-environment-related cognitions including the perceived controllability of the physical environment in which one lives (Wahl & Oswald, 2010). At a behavioral level, agency is about reactive and proactive aspects of using, compensating, adapting, retrofitting, creating, and sustaining places. This is especially important in old age, because of limitations in functional capacity and behavioral flexibility. Both processes are particularly important for P-E exchange in the immediate residential environment, given that place of residence becomes more relevant to people as they age; that older people tend to spend more time in their home; and that many activities take place in this setting (Baltes, Maas, Wilms & Borchelt, 1999). In addition, the physical environment may or may not fit or be attuned to the older individual's functional impairments and needs.

Processes of belonging and agency are therefore two fundamental aspects of aging in place. Both processes are not independent of each other in everyday life for, as Figure 3.1 illustrates, processes of P-E exchange are related to major developmental outcomes as people age. These outcomes echo fundamental developmental tasks in later life—namely, to remain independent for as long as possible as well as to maintain one's integrity in terms of identity. As far as the aging self at

home is concerned, a major goal in later life is to maintain identity and personality. As far as the aging body is concerned, the goal is to remain independent for as long as possible. Finally, we argue that both these outcomes are related to subjective well-being. The important feature of our framework is that autonomy, identity, and well-being are simultaneously considered as major endpoints of P-E interchange as people age, while the traditional view in environmental gerontology has concentrated separately on well-being (e.g., Lawton & Nahemow, 1973), on autonomy (e.g., Carp, 1987), or on identity (e.g., Neisser, 1988). In order to illustrate the integrative potential of the constructs of P-E belonging and P-E agency, we subsume and discuss the following classic approaches of environmental gerontology under these conceptual umbrellas.

Processes of Housing-Related Belonging

Processes of belonging are grounded in conceptualizations and theories of residential satisfaction addressing, for instance, variations in subjective global evaluations of the residence due to age of the inhabitant or geographic location, or the manifestation of place evaluation processes (Aragonés, Francescato & Gärling, 2002; Pinquart & Burmedi, 2004; Weideman & Anderson, 1985). Often, residential satisfaction is assessed by single item self-evaluations (Oswald, Wahl, Mollenkopf & Schilling, 2003). The criticism of this approach is reflected in the well-known residential satisfaction paradox, that is, evaluations are typically biased toward the positive and the correlation between subjective and objective ratings of the house, neighborhood, or city district tends to be low-to-medium at best, reflecting apparent satisfaction despite a poor objective environment (Fernandez-Ballesteros, 2001).

Theories of place attachment and identity (Altman & Low, 1992; Neisser, 1988; Proshansky, 1978; Proshansky, Fabian & Kaminoff, 1983; Stedman, 2002) emphasize domains of belonging in a more process-oriented and differentiated way. Place attachment is not only related to attitudes, but also to a gamut of processes operating when people form affective, cognitive, behavioral, and social bonds to the environment (Brown & Perkins, 1992), thereby transforming "space" into "place" (Altman, & Low, 1992; Rowles & Watkins, 2003). These aspects of bonding can be assessed by objective evaluations, for example, measures of indoor versus outdoor place attachment (Oswald, Hieber, Wahl & Mollenkopf, 2005), but there are also efforts to proceed using qualitative approaches, which empirically probe place attachment and identity (Peace, 2005).

Conceptualizations of the meaning of home are directly related to place attachment as they deal with the most frequent manifestation of attachment processes. Since older adults have often lived a long time in the same residence, cognitive and emotional aspects of the meaning of home are often strongly linked to biography. Such cognitive and emotional links may become manifest through processes of reflecting on the past, symbolically represented in certain places and cherished objects within the home. Thus, belonging covers non-goal-oriented cognitive and emotional aspects of bonding. It embraces behavioral and physical bonding as familiarity and routines develop over time. Meaning of home has been empirically explored mainly via qualitative methodologies (Rowles, 1983; Rubinstein, 1989; Sixsmith & Sixsmith, 1991), but there have also been efforts to quantify aspects of the meaning of home (Oswald & Kaspar, 2012; Oswald et al., 2006).

In terms of outcomes, one major conclusion drawn from the literature with regard to non-goal-directed processes of housing-related belonging in old age is that belonging contributes to housing-related identity (Born, 2002; Neisser, 1988). According to the landmark work of Graham Rowles (1983), processes of place attachment and allocation of meaning (of home) reflect different patterns of physical, autobiographical, and social "insideness" as a result of the long duration of living in the same place. Or as Rowles (1983, p. 114) has put it: "Place becomes a landscape of memories, providing a sense of identity" (see also Rowles & Watkins, 2003). Such a theoretical view of P-E interchange processes may explain why older adults often perceive the risk of losing their home (e.g., due to loss of competence) as closely related to losing crucial parts of self and, concomitantly, as a threat to their personal integrity. Substantial links between self or identity and well-being, as in our framework, have also been expressed in major psychological theories of lifespan development such as Erikson's (1950) psychosocial crisis approach and Levinson's (1986) conception of adult development, as well as in theories on successful aging (Ryff, 1989). Interestingly, none of these lifespan developmental scholars have put much emphasis on the home environment, a prominent portion of the everyday world of aging. Although the focus is on non-goal-oriented cognitive and emotional bonding, processes of belonging are nevertheless also instrumental in daily life as the home is cognitively represented "inside" the person. For instance, if my home means a lot to me because it is the place where I can do whatever I want to do, this may include everyday routines and activities and thus can be a resource for both autonomy and identity.

Processes of Housing-Related Agency

As people age, their residence may serve as an important compensation for age-related loss of competence, especially when significant loss in functional capacity occurs. But aging individuals are at the same time actively using, underusing, or misusing their home environments. For instance, if a person stays out of a room because he or she is not able to maintain it anymore, this could be labeled underuse. Misuse means that there is a living room available which, paradoxically, cannot be used due to a number of barriers. In addition, people may just try to continue with their routines and daily behaviors without making environmental or person-related changes. By contrast, to maintain independence and avoid institutionalization, some people adapt (e.g., retrofit) their residential environment, while others choose instead to move to another, more barrier-free environment (Lawton, 1977; Oswald & Rowles, 2006; Scheidt & Windley, 1985; Wahl, 2001).

This brings us to processes of agency, which are embraced within established concepts and theories of environmental gerontology, including the environmental docility hypothesis (Lawton & Simon, 1968) and the ecological theory of aging (ETA) (Lawton, 1982; Lawton & Nahemow, 1973; Nahemow, 2000). The main proposition inherent in these models is that older people need to react to environmental press in order to remain independent (Lawton & Nahemow, 1973; Scheidt & Norris-Baker, 2004). The ETA describes behavior and affect as a function of the relationship between a level of personal competence and environmental press (Lawton, 1982, 1989, 1998; Nahemow, 2000). Behavioral adaptation in this sense is reduced to a docile or passive response to existing personal and environmental circumstances. In extending this model, the environmental proactivity hypothesis makes the case that older adults are not simply pawns in their environment, but can proactively change housing conditions according to their own wishes and needs in order to maintain independence. Such proactivity allows older adults to cope with environmental press and to profit from environmental richness (Lawton, 1985, 1989) by, for example, moving from residence to residence to better fulfill housing needs (Oswald & Rowles, 2006; Warnes & Williams, 2006). An important methodological implication of using environmental docility and environmental proactivity ideas is that both objective person-related information (e.g., on functional limitations), as well as physical-social-environment-related information (e.g., comprehensive assessment of barriers in a residence) is necessary. Although the ETA has achieved widespread prominence in research and application,

assessment methods still seem far from achieving any gold standard, even though many unevaluated personal and environmental checklists have entered the field (Wahl & Iwarsson, 2007).

Other theoretical concepts address the level of *P-E* fit or lack of fit on several domains of *P-E* exchange as a prerequisite or manifestation of *P-E* agency—for example, in the congruence model of *P-E* fit suggested by Kahana (1982), and in the complementary/congruence model proposed by Carp and Carp (1984). A critical message inherent in *P-E* fit concepts is that the level of behavioral competence in a certain domain corresponds with the given level of environmental press (e.g., barriers at home), leading to adaptation (fit) versus maladaptation (lack of fit). This also means that establishing qualified *P-E* fit assessment opens a major research and practice perspective on *P-E* agency for those who are especially at risk in later life. At this point, assessment instruments have seldom surpassed the status of pure research devices and entered the field of practice and social service intervention. A rare exception is the concept of accessibility, and of measurement approach, suggested by Iwarsson and Slaug (2001, 2010; see also findings below).

Processes of *P-E* agency cover cognitions and evaluations and precede adaptive behavior aimed at regulating *P-E* dynamics as people age. A prominent construct in this vein is psychological control theory (Lachman, 1986; Lachman & Burack, 1993), which has been extended to the housing domain in our previous work (Oswald, Wahl, Schilling, & Iwarsson, 2007). Housing-related control beliefs explain home-related occurrences and experiences as people age, either as contingent upon one's own behavior (internal control), or upon luck, chance, fate, or powerful others (external control). The argument is that control beliefs related to the regulation of *P-E* exchange at home become increasingly important in old age. As was revealed in longitudinal studies, external control beliefs are especially sensitive to age-related changes, particularly due to health and functional ability losses, and thus are crucial in explaining autonomy and well-being (Baltes, Freund, & Horgas, 1999; Clark-Plaskie & Lachman, 1999).

Interplay of Housing-Related Belonging, Agency, and Outcomes of Aging Well

Within environmental gerontology theorizing, the families of concepts speaking to either *P-E* belonging or agency processes in later life are typically addressed separately. It makes sense to assume that both *P-E*

interchange processes are closely intertwined as aging individuals "work" on the developmental task of creating and regulating homelike places. Consequently, *P-E* belonging and agency processes deserve consideration in tandem, not only at the conceptual level but also in empirical research. Depending on the research question, integrative empirical research examining both components that is able to address the synergies and possible constraints that one component may impose on the other, is a higher-order goal. For example, older people living at home and suffering from severe competence loss can adapt to environmental problems in terms of behavioral, cognitive, and emotional adaptation (Oswald & Wahl, 2005). They may objectively reduce their action range and subjectively re-evaluate their interior spaces as more valuable, in contrast to an out-of-home environment that has become less accessible. Thus, *P-E* adaptation in later life does not just refer to behavior, or experience; rather, it refers to both (Rowles, Oswald, & Hunter, 2004). The methodological consequence is that a balanced set of behavioral (objective) as well as experiential (subjective) data related to the physical-social environment needs to be assessed by empirical research.

As far as potential relationships between *P-E* processes of agency and belonging and general outcomes of autonomy, identity, and well-being are concerned, we would assume a greater age-related vulnerability for changes in the *P-E* agency component in relation to the outcome domain of autonomy. In other words, lowered *P-E* agency is expected to coincide with reduced functional competence (e.g., Wolinsky, Stump, Callahan, & Johnson, 1996). In contrast, processes of belonging are expected to remain stable, even after major loss of functional competence or health has occurred, for example, in very old age. Such *P-E* belonging stability may then play a role in the preservation of identity and well-being, which generally do not show much variability across the age continuum (e.g., Smith, Fleeson, Geiselman, Settersten, & Kunzmann, 1999).

HOUSING AND HEALTHY AGING IN VERY OLD AGE

In the remaining part of this chapter we present data from the research project ENABLE-AGE. To our knowledge, this study represents the most comprehensive empirical attempt so far to assess *P-E* agency and belonging as well as the related outcomes of healthy aging, particularly autonomy in daily life, subjective well-being, and the absence of depression. The focus of ENABLE-AGE has been on single-living and community-dwelling very old men and women from different European

urban settings. The study sites in Germany and Sweden continue to follow participants over time in order to explore the predictive quality of different aspects of housing for stability and change in autonomy and well-being as people developmentally move into very old age. In this chapter we refer only to the one-year follow-up assessment of ENABLE-AGE. First, we report findings on relationships among facets of agency and belonging. This is followed by discussion of findings on the relationships of *P-E* processes of belonging and agency on one side, and indicators of healthy aging on the other. Finally, emphasizing facets of agency, we present findings on the predictive quality of different indicators of agency on outcomes of autonomy and well-being over time.

Housing-Related Belonging and Agency

The first aim of the ENABLE-AGE project was to explore the relationship between housing-related belonging and agency. The findings presented here are based on data from a random sample of 1,918 people aged 75 to 89 years, living alone in their private urban residences in Sweden, Germany, Latvia, Hungary, and the United Kingdom. In the survey, a range of well-validated measures from various disciplines (e.g., psychology, occupational therapy) were administered within the home of the participants.

To address housing-related agency on the behavioral level, *P-E* fit in terms of housing accessibility was assessed with the Housing Enabler instrument (Iwarsson & Slaug, 2001, 2010). This instrument was administered in three steps. The first step consisted of assessment of functional limitations of the person. The second was identification of environmental barriers in the home and the immediate outdoor environment, as well as the subsequent computation of an individual accessibility score measuring the level of *P-E* fit, with higher scores indicating more accessibility problems. Third, on the level of cognition and evaluation, agency was assessed with the Housing-Related Control Beliefs Questionnaire: a questionnaire based on the dimensions of internal and external control, although only the external control subscale was included (Oswald, Wahl, Martin & Mollenkopf, 2003).

To address housing-related belonging, a set of quantitative measures was administered: the questionnaire on Usability in My Home (Fänge & Iwarsson, 2003); the questionnaire on Meaning of Home (Oswald, Mollenkopf & Wahl, 1999); and a global evaluation of housing satisfaction adapted from the Housing Options for Older People questionnaire (Heywood, Oldman, & Means, 2002). In assessing usability,

TABLE 3.1 Objective and Perceived Housing Indicators in the ENABLE-AGE Survey

(N = 1918)	Sweden (n = 397)	Germany (n = 450)	UK (n = 376)	Hungary (n = 392)	Latvia (n = 303)	Diff.
Objective housing variable set						
No. of environmental barriers ^a	64 (34-92)	66 (1-92)	37 (1-70)	39 (0-86)	55 (4-85)	***
Total accessibility score ^b	124 (0-670)	122 (0-596)	20 (0-371)	52 (0-531)	103 (0-563)	***
Perceived housing variable set						
Usability of the home, UIMH^c						
- Behavioral subscale	19 (3-27)	19 (1-29)	19 (5-29)	20 (4-29)	15 (1-20)	***
- Physical subscale	28 (5-39)	28 (10-39)	26 (12-39)	26 (6-39)	19 (5-39)	***
Meaning of home, MCH^d						
- Behavioral subscale	8.9 (1.1)	8.9 (1.1)	8.2 (1.5)	7.3 (1.7)	6.6 (1.4)	***
- Physical subscale	8.5 (1.5)	8.9 (1.3)	7.6 (1.7)	8.2 (1.5)	7.1 (1.7)	***
Control of the home, HCO^e						
- Behavioral subscale	8.8 (1.0)	8.7 (0.9)	8.0 (0.9)	8.8 (1.0)	7.6 (1.2)	***
- Physical subscale	8.5 (1.4)	7.8 (1.6)	8.3 (1.5)	7.8 (1.9)	6.8 (1.8)	***
Housing-related control, HCC^f						
- External control	2.8 (0.5)	2.8 (0.7)	2.6 (0.5)	2.3 (0.6)	3.1 (0.4)	***
Housing satisfaction						
- Satisfaction with home conditions	4.8 (0.5)	4.5 (0.7)	4.5 (0.9)	4.2 (1.2)	3.6 (1.3)	***

Note: Originally published in Nygren et al. (2007). Accessibility was assessed by means of the Housing Enabler.
^aMo (median) and range for each national sample.
^bHigher scores indicate higher magnitude of accessibility problems.
^cThe total accessibility score is generated by the profile of functional limitations and dependence on mobility devices in the person (data not presented) and no. of environmental barriers.
^dUIMH (1-3) Mo (median) and range, higher scores indicate higher usability.
^eMCH (1-10) M (mean) and SD, higher scores indicate more meaning.
^fHCO (1-5) M (mean) and SD, higher scores indicate higher control.
^gSatisfaction with housing condition M (mean) and SD, higher scores indicate higher satisfaction. Statistical test for difference was performed with Kruskal-Wallis or with F-test with $p < .05$.

we included two subscales on activity and the physical environment (Fänge & Iwarsson, 2003). To measure meaning, we investigated physical, behavioral, cognitive/emotional, and social aspects of the meaning of home (Oswald et al., 1999; for details see Iwarsson et al., 2007; Nygren et al., 2007; Oswald et al., 2007). Basic descriptive findings, and differences among settings, are depicted in Table 3.1.

In order to explore relationships among the sets of variables, that is housing-related indicators and healthy aging outcomes, we computed canonical correlations, as they parsimoniously describe the number and nature of mutually independent relationships among different sets of variables. In the first set of analyses, we juxtaposed objective environmental assessment of barriers and accessibility problems with data from several parts of the questionnaire covering issues of agency and belonging (see Table 3.2). The findings (reported in detail in Nygren et al., 2007) show that it is not the number of environmental barriers at home, but accessibility that interplays with different aspects of housing-related belonging and control beliefs. This indicates the cognitive facet of agency. Good accessibility was particularly associated with high scores in perceived usability, high amounts of behavioral meaning of home (e.g., "managing things without the help of others," "doing everyday tasks," "being able to change or rearrange things as I please") and low external control beliefs (e.g., "having a nice place is all luck," "where and how I live has happened more by chance than anything else").

Although there were different levels of accessibility in different European settings (see Table 3.1), the findings revealed comparability of the relationship between aspects of agency and belonging, simultaneously controlling for basic health and socioeconomic status. That is, there was a strong and consistent link between housing-related belonging and agency in very old age across the different settings. This was reflected in measures of accessibility, control beliefs, usability, and behavioral meaning.

Housing-Related Agency, Belonging, and Healthy Aging

The second aim of the ENABLE-AGE study was to explore relationships between housing (in terms of agency and belonging) and healthy aging. Indicators for healthy aging were autonomy, in terms of independence in daily activities, and subjective well-being. We assessed independence in activities of daily living (ADLs) (based on professional judgment) by using the ADL Staircase (Sonn & Hulter-Åsberg, 1991). Perceived independence in ADL was assessed using a single-item self-evaluation measure from the Neuropsychological Aging Inventory (Oswald, 2005). Subjective well-being included both cognitive (life satisfaction and environmental mastery) and emotional dimensions (affect and depression). We assessed life satisfaction through a single-item self-evaluation measure and assessed environmental mastery by the Environmental Mastery subscale of the Psychological Well-Being Questionnaire (Ryff, 1989). We assessed affect using the Positive and Negative Affect

TABLE 3.2 Correlations of Objective and Perceived Housing Variables (First Canonical Variates)

	Sweden	Germany	UK	Hungary	Latvia
Eigenvalues	0.5***	0.2***	0.4***	0.4***	0.5***
Canonical correlations (%)	.58 (.83)	.42 (.93)	.52 (.88)	.51 (.78)	.57 (.81)
Objective housing variable set*					
Environmental barriers	-.39 (.10)	-.11 (.03)	.25 (-.04)	-.74 (-.43)	.18 (-.15)
Magnitude of accessibility problems	-1.0 (-.97)	-1.0 (-1.0)	1.0 (1.0)	-.92 (-.74)	.99 (1.0)
Perceived housing variable set*					
Usability in the home					
Physical environmental aspects	.78 (.38)	.69 (.29)	-.67 (-.24)	.35 (-.11)	-.81 (-.21)
Activity aspects	.82 (.56)	.63 (.37)	-.67 (-.21)	.75 (-.54)	-.28 (-.02)
Meaning of home					
Behavioral aspects	.60 (.31)	.70 (.45)	-.76 (-.50)	.71 (.20)	-.89 (-.70)
Physical aspects	.19 (-.06)	.48 (.14)	-.63 (-.19)	.79 (.23)	-.38 (.21)
Cognitive/emotional aspects	.02 (-.14)	.17 (-.20)	-.14 (.33)	.76 (.12)	-.46 (.16)
Social aspects	.25 (.00)	.14 (.05)	-.27 (.07)	.69 (.18)	-.61 (-.32)
Housing-related ext. control beliefs	-.50 (-.18)	-.60 (-.37)	.61 (.32)	-.64 (-.19)	.63 (.28)
Housing satisfaction	.12 (-.16)	.09 (-.12)	-.40 (-.17)	.18 (-.14)	.14 (.19)

Note. Originally published in Nygren et al. (2007).
 *Correlations of objective housing variables with first canonical variate of objective housing variable set. Objective housing variables according to the Housing Enabler.
 *Correlations of perceived housing variables with first canonical variate of perceived housing variable set. Perceived housing variables according to the Usability in My Home Questionnaire, UIMH, the Meaning of Home Questionnaire, MOH, the Housing-Related Control Beliefs Questionnaire, HCBQ, and adapted satisfaction with condition of the home. Standardized canonical coefficients are shown in parentheses; correlations >.35 are boldfaced. **p < .001.

Schedule (Watson, Clark, & Tellegen, 1988). This yielded a score for both negative (e.g., distressed, guilty, nervous, afraid, and ashamed) and positive affect (e.g., interested, excited, strong, active, inspired). Finally, we assessed depressive symptoms with the Geriatric Depression Scale (Yesavage et al., 1983).
 The findings (reported in detail in Oswald et al., 2007) show that both processes of housing-related agency and belonging are related to autonomy and well-being (see Table 3.3).

TABLE 3.3 Correlations of Aspects on Housing and Healthy Aging (First Canonical Variates)

	Sweden (n = 346)	Germany (n = 343)	UK (n = 350)	Hungary (n = 337)	Latvia (n = 267)
Eigenvalues	1.2***	1.3***	1.6***	1.6***	1.8***
Canonical correlations (%)	.74 (.73)	.75 (.79)	.78 (.74)	.78 (.72)	.80 (.68)
Housing variable set					
Environmental barriers	-.03 (.15)	-.08 (-.01)	-.09 (.07)	-.21 (.21)	.02 (.12)
Magnitude of accessibility problems	-.73 (-.48)	-.61 (-.30)	-.67 (-.32)	-.69 (-.45)	-.69 (-.34)
Usability in the home					
Physical environmental aspects	.45 (.05)	.42 (.03)	.58 (.09)	.43 (.06)	.36 (.03)
Activity aspects	.64 (.24)	.71 (.35)	.55 (.08)	.27 (.03)	.72 (.28)
Meaning of home					
Behavioral aspects	.81 (.45)	.74 (.38)	.85 (.45)	.82 (.40)	.86 (.36)
Physical aspects	.17 (-.08)	.57 (.17)	.68 (.15)	.63 (.04)	.59 (.03)
Cognitive/emotional aspects	.34 (.18)	.35 (.03)	.45 (.10)	.61 (.19)	.58 (.11)
Social aspects	.30 (-.03)	.13 (-.08)	.35 (-.09)	.46 (-.03)	.52 (.01)
Housing-related ext. control beliefs	-.53 (-.21)	-.58 (-.20)	-.64 (-.33)	-.75 (.34)	-.66 (-.26)
Housing satisfaction	.05 (.06)	.16 (-.03)	.15 (-.09)	.28 (.02)	.08 (.01)
Healthy aging variable set					
Independence in daily activities (ADL)	.83 (.52)	.68 (.37)	.75 (.34)	.68 (.30)	.78 (.37)
Perceived functional independence	.80 (.41)	.76 (.38)	.82 (.37)	.80 (.23)	.87 (.46)
Life satisfaction	.36 (.04)	.50 (.13)	.47 (-.01)	.64 (.08)	.29 (-.07)
Environmental mastery (Ryff)	.59 (.23)	.76 (.45)	.66 (.20)	.84 (.41)	.58 (.18)
Depression (GDS)	-.55 (-.12)	-.53 (.01)	-.76 (-.42)	-.78 (-.24)	-.70 (-.32)
Positive affect (PANAS)	.33 (.05)	.43 (.10)	.39 (.02)	.46 (.09)	.49 (.04)
Negative affect (PANAS)	-.22 (-.06)	-.32 (.01)	-.28 (.06)	-.39 (.01)	-.26 (.04)

Note. Originally published in Oswald et al. (2007).
 ADL = Activity of Daily Living; GDS = Geriatric Depression Scale; PANAS = Positive and Negative Affect Schedule. Subsamples are reduced as a result of listwise deletion in canonical correlation procedures. Standardized canonical coefficients are shown in parentheses; correlations >.35 are boldfaced. **p < .001.

Again, it was not the mere number of barriers in the home environment, but accessibility that proved important for autonomy in terms of independence in daily life and well-being. Additionally, behavioral aspects of the meaning of home, in particular, correlated with autonomy and well-being, indicating housing-related belonging. In other words, those participants with good accessibility (high P-E fit) at

home, who perceived their home as useful and valuable for activities, and who thought that others or fate were marginally responsible for their housing situation (low external control beliefs), had better autonomy in daily life, a better sense of well-being (environmental mastery), and suffered less from depressive symptoms. Taken together, these cross-sectional findings suggest that when striving for barrier-free building standards it is also important to consider psychological issues of meaning and control beliefs and thus to encompass a holistic approach that takes both processes of *P-E* agency and *P-E* belonging into account.

Housing-Related Agency and Healthy Aging Over Time

The third aim of the ENABLE-AGE project was to explore home environments as a determinant of healthy aging in very old age. To do this, we explored empirical links between selected indicators of *P-E* exchange processes and indicators of healthy aging over time, as well as changes in these indicators. For this part of the study, we focused on aspects of agency in terms of accessibility and control beliefs, as well as on outcomes of autonomy and subjective well-being. Based on our understanding of agency, we reasoned that housing accessibility and housing-related control beliefs should be considered in concert, because they are complementary, both conceptually and empirically. Accessibility focuses on behavior; control-beliefs highlight evaluation and cognition. Outcomes were assessed using measures of ADL functioning, general well-being, positive and negative affect, and depression. Data were drawn from a sub-sample of 847 participants (at Time 1) in Sweden and Germany, 636 of whom were reassessed one year later (Time 2).

We expected that both indicators of agency would be important for both outcomes, but that accessibility would be more important for daily independence, whereas control beliefs would be more important for well-being-related outcomes. In addition, we assumed that behavioral and cognitive aspects of agency interact and that such interaction also relates to outcomes. That is, having accessibility problems and having at the same time strong external control beliefs would result in negative outcomes, because pronounced lack of fit between competence and environmental press would be intensified by the perception that attempts to modify or optimize one's home environment were subject to uncontrollable external forces. In contrast, if one lives in an accessible place, being high in external control

may not be that important, because overall independence is still high. Thus, we assumed that a combination of low accessibility and high external control beliefs further increases the risk for negative outcomes, while external control should not play a role in the case of good accessibility.

As far as potential longitudinal changes in outcomes of autonomy and well-being in relation to agency at baseline were concerned, we expected that accessibility problems and control beliefs would reveal a substantial relationship with change in daily independence, but not so much with well-being. More specifically, we expected that having many accessibility problems and external control beliefs at baseline, would be associated with decreasing daily independence over one year.

The findings (reported in detail in Wahl et al., 2009) from cross-sectional regression analyses revealed that both aspects of agency, accessibility and control beliefs, were consistently associated with outcomes of autonomy and well-being, with accessibility being more strongly associated with daily independence and external control beliefs more strongly associated with well-being-related outcomes. All relationships were confirmed in the expected direction, that is, a low accessibility was linked with less daily independence, lower life satisfaction, lower positive affect, and higher levels of depressive symptoms. Similarly, higher external control beliefs were associated with less daily independence, lower life satisfaction, lower positive affect, higher negative affect, and higher levels of depressive symptoms (see Table 3.4).

Significant and marginally significant interaction terms underscored that being high in external control beliefs in a situation of low accessibility was linked with more negative outcomes, while external control did not play a role in the situation of high accessibility. In other words, particularly if a participant experienced low accessibility and felt that others were responsible for his or her own home environment, this came with an increase in depression and vice versa.

In the longitudinal regression analysis, accessibility at baseline was predictive for short-term changes (i.e., over one year) in daily independence and depression, while external control beliefs did not show a substantial relationship with any change in outcomes (see Table 3.5).

We found significant effects of the interaction between both aspects of agency in relation to changes in life satisfaction and depression. The predictive role of accessibility on changes in life satisfaction and

TABLE 3.4 Findings of Regression Analyses (Cross-sectional Analyses at T1, N = 847)

Predicting Variable	ADL Independence/ Dependence		Life Satisfaction		Positive Affect		Negative Affect		Depression	
	Stand. β	Semi- partial ^c R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2
Country (Germany = 0; Sweden = 1)	-.048	.002	-.102*	.008	-.24***	.049	.083*	.006	.085*	.006
Age	-.111**	.011	.044	.000	-.013	.000	-.023	.000	.003	.000
Sex (f = 0, m = 1)	.118***	.013	.054	.000	.133***	.018	.091*	.008	-.023	.001
Perceived health (1-5)	-.022	.000	-.282***	.070	-.263***	.049	.108*	.008	.315***	.071
Magnitude of accessibility problems (MAP) (0-596) ^a	-.342***	.088	-.077(*)	.007	-.076(*)	.004	.028	.000	.098*	.007
External housing related control beliefs (Ext. HCB) (1-5) ^b	-.156***	.021	-.088*	.025	-.145***	.025	.129**	.015	.167***	.025
Interaction MAP x ext. HCB	-.059(*)	.003	-.042	.011	-.024	.000	.015	.000	.107**	.011
Model R^2	.23		.11		.16		.05		.18	

Note. Originally published in Wahl et al. (2009). Data from the project ENABLE-AGE, T1, N = 847 (Sweden, Germany), with $p < .10$ (*), $p < .05$ *, $p < .01$ ***, $p < .001$ ***.

^aHigher scores indicate larger magnitude of accessibility problems.

^bHigher scores indicate higher external housing related control beliefs.

^cProportion of the dependent variable's total variance explained by regression on the predictor *uniquely*; not to sum up to the model's total R^2 .

TABLE 3.5 Findings of Regression Analyses (Longitudinal Analyses Considering 1-year Change in Outcomes, N = 636)

Predicting Variable	ADL Independence/ Dependence		Life Satisfaction		Positive Affect (PANAS)		Negative Affect (PANAS)		Depression (GDS)	
	Stand. β	Semi- partial ^c R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2	Stand. β	Semi- partial R^2
Country (Germany = 0; Sweden = 1)	-.033	.000	.088(*)	.006	-.076	.005	.078	.005	.012	.000
Age	-.034	.001	.010	.000	-.077	.005	-.010	.002	.039	.001
Sex (f = 0, m = 1)	-.069	.005	-.056	.003	.018	.000	.053	.003	.046	.002
Perceived health (1-5)	-.050	.001	-.000	.000	.087(*)	.005	.049	.002	-.059	.003
Magnitude of accessibility problems (MAP) (0-596) ^a	-.252***	.048	-.051	.002	-.016	.000	-.010	.000	.134**	.014
External housing related control beliefs (ext. HCB) (1-5) ^b	.064	.004	.051	.002	-.007	.000	.005	.000	.017	.000
Interaction MAP x ext. HCB	.030	.000	.104*	.011	-.013	.000	-.005	.000	-.112*	.012
Model R^2	.08		.02		.02		.01		0.4	

Note. Originally published in Wahl et al. (2009). Data from the project ENABLE-AGE, T2, N = 636 (Sweden, Germany), with $p < .10$ (*), $p < .05$ *, $p < .01$ ***, $p < .001$ ***.

^aHigher scores indicate larger magnitude of accessibility problems.

^bHigher scores indicate higher external housing related control beliefs.

^cProportion of the dependent variable's total variance explained by regression on the predictor *uniquely*; not to sum up to the model's total R^2 .

depression declines with increasing levels of external control beliefs, and amplifies with decreasing external control beliefs. In other words, if a participant lived in a situation with pronounced lack of accessibility, and at the same time felt that others were responsible for his or her home environment, this seemed to lead to an increase in depression and decrease in life satisfaction. In contrast, participants low in accessibility and, at the same time, feeling themselves responsible for their own home were not so much at risk for an increase in depressive symptoms and lowered life satisfaction.

In sum, these data document substantial relationships between types of agency and outcomes of autonomy and well-being. Such evidence is required to further improve housing-oriented prevention and intervention strategies in advanced old age. In terms of specific implications for planners and designers, we need to make sure that everyone who is involved in the process of providing and optimizing living circumstances for older adults is obliged to consider *P-E* relationships in his or her work. Based on our findings, it is not just the number of accessibility problems or the psychological attitude toward housing, but a combination of these factors which may heighten one's risk of losing independence over time among a group of particularly vulnerable older adults.

FROM KNOWLEDGE TO PRACTICE

It has long been argued that older adults are pawns of their environmental conditions, particularly of inadequate housing characteristics. But it is now clear that this relationship is complex and multifaceted. In a sense, adulthood and aging means the ongoing creation and re-creation of homelike places, although this does not imply observable "objective" *P-E* change in many instances but, rather, processes of psychological adaptation operating "under the surface." The aim of this chapter was to extend such understanding of *P-E* interchange in the immediate home environment into a consideration of later life. Based on a conceptual framework on processes of *P-E* interchange and related outcomes in later life, we presented data from the European project ENABLE-AGE to explore empirically three areas: the relationship between housing-related agency and belonging; the relationship between housing (in terms of agency and belonging) and healthy aging; and the home environment as a determinant of healthy aging in very old age. We believe strongly that our perspective has important implications for future research within environmental gerontology, but also far-reaching implications for interventions that will facilitate improved environmental adaptation.

In terms of future environmental gerontology research, our work supports the notion that it is possible to reliably and validly assess both processes of belonging and agency (Iwarsson & Slaug, 2010; Oswald & Kaspar, 2012; Oswald et al., 2006; Oswald & Wahl, 2004). We also argue that seeking a balanced assessment of both processes is important and is the only way to learn about the interplay of belonging and agency. It seems that most environmental gerontology research in the past has focused on *either* belonging *or* agency-related processes. The interplay between these constructs is still far from clear and our research only offers first steps in this direction (e.g., Wahl et al., 2009). It may be a good strategy to develop a minimum data set covering both belonging and agency-related processes and integrate such an assessment in large-scale cross-sectional and longitudinal studies. As we see it, this would provide better linkage between environmental gerontology oriented research and other areas of aging research and practice.

We also see more general conceptual (and empirical) implications. For example, the consideration of *P-E* belonging and agency processes may facilitate refinement of now classic views of developmental adaptation and "successful" aging such as Baltes and Baltes' (1990) model of selection, optimization, and compensation (SOC). SOC mechanisms can be expected to go hand-in-hand with *P-E* agency processes as addressed in our approach. For example, changing one's home (moving to another site or making housing modifications) in later life may reflect important selection and compensatory agency which has not been explicitly explored in the SOC model. On the other hand, processes of *P-E* belonging seem to be systematically underrated in many models of lifespan development and adaptation such as the SOC. That is, these models are all very much agency oriented (maintain or lose agency) and leave not much room for non-goal-directed processes of *P-E* belonging. It may be the case that processes of belonging may be more important for successful human development, and this may be particularly true for very old age (Wahl, Iwarsson, & Oswald, 2012; Wahl & Lang, 2006). If we consider aging in very late life as a mixture of active (even proactive) and reactive behavioral adaptation (of the environment) to compensate for age-related losses, as well as processes aiming to maintain stability of the given living situation as long as possible, then the interactive roles of agency and belonging in aging in place might be even more effective.

This perspective is underrepresented in projects on technological environments, such as in the field of ambient assisted living (e.g., Lindenberger, Lövdén, Schellenbach, Li, & Krüger, 2008), although it is true that belonging processes play a strong role in traditional

lifespan developmental models such as Erikson's (1950) psychosocial crises approach. The classic Eriksonian switch from generativity to ego-integrity as central to later life and particularly very old age (see also Erikson, Erikson, & Kivnik, 1989) is not too far from a shift from agency to belonging. Similarly, Carstensen's (2006) extensive empirical work, driven by socio-emotional selectivity theory, has demonstrated a transition from information-seeking to intimacy-oriented social motivations as people age. In sum, focusing explicitly on processes of belonging without any a priori primacy of agency-related processes may be important in order to counterbalance the "modern" trend in developmental science and aging research to use predominantly the "agency glasses" to better understand developmental dynamics. At the same time, our understanding of belonging processes has nothing to do with "classic" disengagement, but shows some overlap with concepts such as reminiscence, life review, and attachment processes in adult life (Lopez & Brennan, 2000).

In the light of our framework and findings, it is an important requirement that programs of housing adaptation and work to locate older people in optimal environmental settings are driven by agency and belonging considerations. For example, if we look for ways to adapt housing in very old age in order to improve or maintain daily independence, we should not ignore how psychological processes, like feeling oneself responsible for one's own home, can also have substantial consequences for autonomy and well-being, in combination with barrier-free amenities. Based on our extended set of empirical measures, we were able to show that older adults who have many accessibility problems are at high risk of decreasing daily independence over time. We were also able to show that accessibility problems and a feeling of limited control over the home environment can lead to depression and decrease in life satisfaction, whereas those who felt less externally controlled were at less risk for increased depressive symptoms. In practical terms this could mean, for instance, that counseling programs could be devised not only to address observed behaviors and objective barriers but also to include measures (e.g., questionnaires) to learn more about the inhabitant's attitudes toward his or her environment. One might even think of developing separate individual agency and belonging profiles which could help to tailor individual environmental adaptation/maintenance programs. We suggest that in terms of practical objectives, P-E fit (accessibility), usability, and housing-related control beliefs may provide important guidelines for such consultations. At the same time, it is important in terms of belonging to get a good understanding of residential satisfaction, of the meanings with

which home is imbued, and of the strength and flexibility of given place attachment processes.

To our knowledge, very little research exists on the role of belonging and agency in demented and cognitively impaired older adults (as well as in those with other specific age-related diseases). It seems, in any case, to be a consistent clinical finding that the "cultivation" of belonging is important for older adults with dementia and may even compensate for deteriorated agency capabilities. In the final analysis, aging societies should be increasingly aware that planning for housing in old age is clearly about more than just considering barrier-free buildings. Indeed, adopting a more sophisticated view of the role of housing and well-being in old age may provide an important pathway to learning much more about personhood and psychological adaptation in later life.

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