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## Challenges to Aging in Place: Understanding Home Maintenance Difficulties

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### Abstract

Age-related declines in capabilities may compromise older adults' ability to maintain their homes thus threatening successful aging in place. Structured interviews were conducted with forty-four independently living older adults ( $M_{age} = 76.1$ ,  $SD = 4.7$ ) to discuss difficult home maintenance tasks and how they managed those tasks. Solutions to managing difficulties were categorized as person-related or environment-related. The majority (85%) of responses were person-related solutions. An understanding of the specific challenges that older adults face in maintaining their homes can guide redesign efforts and interventions to effectively support older adults' desire to age in place.

### Keywords

aging in place; home maintenance; older adults; ecological model of aging

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A crucial component of successful aging is maintaining one's independence. One way to achieve this independence is for older adults, persons aged 65 or older, to age in place (Lawton, 1982). Aging in place has been broadly defined throughout the literature as the ability to stay in one's own home as a person ages (Cutchin, 2003; Kunstler, 2002; Lanspery & Hyde, 1997). Older adults express as a primary goal to age in place (AARP, 2005). The

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U.S. housing data suggest that the majority of older adults are indeed achieving their goal; 80% of older adults live independently in their own homes (Houser, Fox-Grage, & Gibson, 2006).

We know that many older adults want to stay in their own homes as they age, but the specific challenges they face in achieving this goal are not known. Older adults may face daily frustrations and difficulties in their everyday activities (Clark, Czaja, & Weber, 1990; Rogers, Meyer, Walker, & Fisk, 1998), but the specific obstacles that older adults encounter in home maintenance are not well documented. Home maintenance is essential to ensure a safe and healthy environment; in fact, over one hour of every day is spent doing home maintenance (Lawton, 1990).

With the population of older adults expected to grow significantly over the next few decades (Administration on Aging, 2010), research is needed to understand the challenges faced as people age in place. If older adults are experiencing difficulties in maintaining their homes, their goal of aging in place is threatened. Research examining home maintenance challenges will inform a range of domains such as support providers from local service organizations or robot designers on what tasks older adults need assistance performing.

Aging in place is a process that involves both the person and the environment; it is a continuous dynamic interaction as both the person and the environment change (Golant 2003; Wahl & Lang, 2003). The idea of a dynamic and impactful relationship between persons and their environment is not new: Lawton and Nahemow (1973) developed a framework called the ecological model of aging to describe the interaction of a person and the environment. According to their model, when a person has the capabilities to meet the demands of the environment or the demands of the environment are reduced to match the person's capabilities, a successful interaction occurs. However, once the demands of the environment exceed the person's capabilities or the person's capabilities exceed the environment demands, a maladaptive situation occurs.

Capabilities and limitations of a person change across the lifespan, sometimes predictably and sometimes unpredictably. For example, there are general patterns of physical, perceptual, and cognitive changes that occur with age: strength decreases; hearing and vision loss occurs; and working memory declines (for a review see Fisk, Rogers, Charness, Czaja, & Sharit, 2009). Such age-related changes can pose challenges for an older adult to meet the demands of the environment (Marsiske et al., 1999; Seidel et al., 2009). Unpredictable events can also occur that limit a person's resources. For example, a grandmother might trip on a grandchild's toy while vacuuming the stairs in her home and break her leg. Such an abrupt and acute injury would significantly decrease the woman's capability to interact successfully with her environment.

Similar to the dynamic nature of the person, the environment can also fluctuate in the demands placed on residents in both predictable and unpredictable ways. One's home environment requires predictable maintenance such as changing furnace filters, cleaning floors, replacing light bulbs, and mowing the lawn. But unpredictable events might arise that can demand increased effort on the resident's part. For example, a strong thunderstorm may rip shingles off the roof resulting in water damage to the inside ceiling of the home. The resident must take quick action to repair the damage. The extent to which residents are able to manage such environmental demand fluctuations determines the quality of interaction between the person and the environment.

A research challenge of studying private home environments is the inherent variability between residences and across participants. The extant research investigating older adults and their interactions with their home environments often includes participants with a wide

range and degree of cognitive or physical disabilities (e.g., Lawton, 2001) or is focused on the hazards of the home and implications for the safety of the older adult resident (e.g., Fisher, Baker, Koval, Lishok, & Maisto, 2007; Gitlin et al., 2006; Lau, Scandrett, Jarzebowski, Holman, & Emanuel, 2007). Research has not focused on home maintenance challenges.

To live independently, older adults must maintain various activities of daily living within the home. Activities of daily living or ADLs (Lawton, 1990) include eating, toileting, and bathing that are essential for independent survival. Instrumental activities of daily living or IADLs (Lawton) are higher functioning activities such as cooking, managing medications, managing finances, and performing housework, required for maintaining independence within one's home. It remains to be investigated how older adults achieve and maintain their independence in their home beyond the basic and instrumental activities of daily living.

Successful performance of ADLs and IADLs is *necessary* for aging in place; however, successful performance of ADLs and IADLs is not *sufficient* for aging in place. The goal of our study was to explore the tasks independently living older adults reported as required in maintaining a home. Specifically, we investigated which home maintenance tasks were difficult to perform and the solutions older adults used in managing those difficulties. This study broadens the scope of the extant aging-in-place research to include tasks beyond ADLs and IADLs to explore the concept of home maintenance.

## Study Overview

Home maintenance was the locus of the investigation; we explored the issues that older adults have with maintaining their home and issues that they might foresee in performing those tasks in the future. We also investigated the services, products, technologies, or remodeling options older adults considered or used that could help them.

A structured interview approach was used for this investigation. This approach provides a structured, systematic examination but remains a relatively open forum for participants to provide detailed responses (Krueger, 1994). Given the wide range of activities individuals may be performing to maintain their homes, the structured discussions allowed us to capture the range of response while still being systematic.

The overall sample comprised diverse participants (men, women, married, and single participants) that were racially representative (African American and Caucasian) of metropolitan Atlanta residents. We included participants who lived independently in a variety of non-institutional residences. We were also interested in exploring differences in the tasks and solutions described by older men and women as well as between those participants who were single and those living with a committed partner.

## Method

### Participants

We conducted 11 interview sessions with one to seven independently living adults between the ages of 66 and 85 ( $M = 76.1$ ,  $SD = 4.7$ ). There were 44 participants. Thirteen women and thirteen men were recruited from the Human Factors and Aging Laboratory's participant database. These were volunteers located in the Atlanta metropolitan area who agreed to be contacted for study participation opportunities and who came to the Georgia Institute of Technology's campus to participate. An additional eleven women and seven men were recruited from local senior centers, and those interviews were conducted at the recruitment location.

Eligible participants were required to live independently. They either lived alone or with their spouse only (i.e., no children). Half of the participants were married. Participants were compensated thirty dollars.

Interview sessions were stratified by sex, marital status, and race to create a homogeneous group environment to encourage open discussions. Table 1 provides demographic and background information for the sample. Twenty-six participants were Caucasian, and eighteen participants were African American. Thirty-two participants lived in detached single-family homes, 6 lived in apartments, 3 in condominiums, and 1 participant lived in a multi-family home (e.g. duplex, triplex). Two participants did not answer this question.

## Materials

Standardized materials developed by the Center for Research and Education on Aging and Technology Enhancement (CREATE, [www.create-center.org](http://www.create-center.org); Czaja et al., 2006) were used for assessment of eligibility and for collecting demographic, health, and technology experience for the participants. Each participant completed a telephone pre-screening interview that assessed basic cognitive functioning and working memory capacity. A minimum score of 8 out of 10 was required on the basic cognitive functioning assessment, and a minimum score of 6 items recalled on the first passage or 4 items recalled on the second passage was required on the working memory capacity assessment.

Participants completed the following: (1) Background Questionnaire documenting general demographic, health information and prior computer experience; (2) Technology Experience Questionnaire documenting prior experience with technology across a broad range of domains; (3) Characteristics of the Home Questionnaire that asked detailed questions about each participant's residence. Subsequent to the interview, participants completed a survey asking them to list the issues that make living at home difficult as well as how they find a person or company to provide home services.

The interview script was tested and revised (three groups; n= 12) to ensure that the questions were clear and prompted discussion.

## Procedure

Participants were prescreened over the telephone to assess eligibility for the study (Czaja et al., 2006). Upon successfully completing the prescreening process, participants were scheduled for an interview session. The Background Questionnaire and Technology Experience Questionnaire were mailed to each participant to be completed at home and returned to the experimenter at the time of the interview.

Upon arrival to the study site, participants provided written informed consent. Next, the moderator introduced himself or herself. All of the female structured interviews were moderated by the same female moderator; all of the male interviews were moderated by one of two male moderators. Participants were informed that the discussion would be digitally audio-recorded and later transcribed. The moderator then briefly described the topic and goals of the interview session as well as the rules for the conversation. Participants were instructed to speak about their own personal experiences in a loud, clear voice and to not interrupt other participants.

Discussion was initiated with an "icebreaker" in which participants were asked to give their first names and to briefly describe their home and how long they had lived in that home. Participants were then asked to describe the tasks they must do to maintain their home and to discuss the tasks that were difficult or could become difficult to perform. The available products, services, technologies, and remodeling options that could help with those issues

were also discussed. Participants were given an opportunity to offer additional comments before a break was taken. Participants completed the Characteristics of the Home Questionnaire and a final survey, then were debriefed about the study and compensated for their time.

## Interview Data Analysis Process

### Segmenting Transcripts

Participant responses were segmented and then coded for analysis. Segmentation rules were developed based on an initial coding scheme that focused on difficult home maintenance tasks and solutions to manage those difficulties. The term “solution” was used to describe how the participants managed difficult tasks; it cannot be assumed that the solutions described by the participants are optimal or even always successful. A segment was considered any utterance in which a task was mentioned and at least one difficulty or one solution was also mentioned. See Figure 1 for examples.

The first and second authors independently segmented an initial transcript selected at random until a reliability of at least 80% was achieved. This was an iterative process that required updating the segmentation rules with each round of segmenting. Once reliability was achieved, another transcript was segmented to double-check reliability. The remaining transcripts were divided between the authors to segment independently, and a final transcript was segmented by both authors to confirm reliability.

### Coding Segments

The goal of the coding scheme was to capture and categorize the home maintenance tasks that were difficult for participants to perform and their solutions for managing those difficulties. The coding scheme was based on the literature and specific comments of the participants. The same process was followed as in the segmenting process and a reliability of at least 80% was required between the two coders.

Seven sub-categories of tasks were developed. These included the following types of tasks: cleaning, outdoor, home upkeep, repair, indoor update/remodel, movement within the home (specific to performing maintenance tasks), and other.

The high-level coding category called solutions was guided by the ecological model of aging (Lawton & Nahemow, 1973) to categorize participants' responses into person-related or environment-related solutions. Person-related solutions were defined as comments that included any change in the participant's behavior to perform a difficult home maintenance task. Environment-related solutions included any mention of changing one's home or moving into an apartment or condominium to ease the burden of performing difficult tasks. Table 2 provides the solution coding scheme categories, sub-categories, and definitions.

Figure 1 provides examples of how segments were specifically coded. Each segment was coded on three dimensions: task, difficulty, and solution. Per the segmentation rules, a segment was considered any utterance in which a task was mentioned and at least one difficulty or one solution was also mentioned; thus, it was possible to have a “not mentioned” code for difficulty or solution.

### Analysis Overview

Chi-square tests of homogeneity were conducted to determine if there were significant differences in the frequencies of categories mentioned by sex and marital status. All tests were conducted using an alpha of .05 unless specified otherwise. Frequencies less than five were excluded from all analyses. Analyses of residuals were conducted to evaluate which

categories accounted for the significant effects (i.e., a residual greater than 2.00 indicates the factor was a major influence for the significant chi-square test statistic).

## Results

### Difficult Home Maintenance Tasks

The total number of comments made by participants that were related to difficult home maintenance tasks was 316; nearly 70% were cleaning-related or outdoor-related (see Figure 2). Difficult tasks categorized as cleaning included vacuuming, tidying, changing bed linens, washing dishes, doing laundry, cleaning the toilet, taking out the garbage, and general cleaning. Outdoor tasks included mowing the lawn, painting the outside of the home, cleaning the gutters, or general outdoor tasks in which the participant was not any more specific about the task other than it occurred on the exterior of the home.

An additional 16% of the difficult tasks mentioned were categorized as home upkeep. This category of tasks included HVAC (Heating, Ventilating, and Air Conditioning) maintenance (e.g., changing or replacing the furnace filter), pest control, replacing light bulbs, roof replacement, and maintenance of smoke alarms and carbon monoxide detectors.

### Chi-Square Analysis for Difficult Home Maintenance Tasks

Table 3 provides a summary of the differences between single and married participants and between men and women with respect to the types of difficult home maintenance tasks mentioned. The differences were determined via chi-square analyses as detailed next.

**Cleaning**—The omnibus chi-square test was significant for both sex,  $\chi^2(1) = 6.26, p < .05$ , and marital status,  $\chi^2(1) = 34.90, p < .05$ , indicating a difference in the distribution of responses. Analysis of the cleaning sub-categories revealed significant residuals for marital status for the following tasks: cleaning floors (residual = 2.46), general cleaning (residual = 2.32), and bed maintenance (e.g., changing bed linens, rotating the mattress) (residual = 2.45). These results were driven by single participants mentioning these tasks more often than married participants. There were no residuals greater than 2.00 by sex suggesting that each factor contributed equally to the overall result. Overall, females mentioned cleaning floors and bed maintenance more often than males, whereas males mentioned general cleaning more frequently than females.

**Outdoor**—The omnibus chi-square test was significant for both sex,  $\chi^2(1) = 32.91, p < .05$ , and marital status,  $\chi^2(1) = 30.63, p < .05$ , indicating a difference in the distribution of responses. Further analysis of the outdoor sub-categories revealed significant residuals for painting for married (residual = 2.83) and male (residual = 2.49) participants. Cleaning gutters was mentioned more by male participants (residual = 2.92) than female participants. These results indicate that men encounter more difficult outdoor tasks than women. Additionally, more married men mentioned painting the outside of the home as a difficult task than single men.

**Home upkeep**—A significant omnibus chi-square test was found for both sex and marital status,  $\chi^2(1) = 9.25, p < .05$ , and  $\chi^2(1) = 7.14, p < .05$ , respectively. Further analysis of the home upkeep sub-categories revealed that the effect was driven by females (residual = 2.13) mentioning maintenance of the HVAC systems more frequently than males. Additionally, single participants (residual = 1.89) mentioned difficulty maintaining HVAC systems more frequently than married participants.

## Solutions to Managing Difficult Home Maintenance Tasks

According to the segmenting rules, each segmented comment was not required to have a solution mentioned. Therefore, a portion of the segmented utterances was coded as “not mentioned” for the solution category. Once these coded segments were removed, 258 remained of the total 316. See Figure 3 for the frequency of solutions mentioned.

Person-related solutions comprised nearly 85% of the comments. This category included the following sub-categories: assistance from other; covert thought/overt action; outsource; perseverance; task not done; and tools and technologies. Environment-related solutions, which included home modification or remodeling and moving to a condominium or apartment, accounted for 14% of participant responses. Outsourcing tasks accounted for the majority (53.5%) of all comments.

## Chi-Square Analysis for Solutions to Managing Difficult Home Maintenance Tasks

Table 4 provides a summary of the differences between single and married participants and between men and women with respect to the types of solutions mentioned to manage difficult home maintenance tasks.

**Person-related solutions**—A significant omnibus chi-square test was obtained for person-related solutions for both sex,  $\chi^2(1) = 30.78, p < .05$ , and for marital status,  $\chi^2(1) = 17.07, p < .05$ . The significant result for sex was driven by differences in frequencies for the following sub-categories: tools and technologies, perseverance, and task not done. A residual of 1.99 for tools and technologies revealed that women mentioned using tools and technologies to support difficult task performance more often than men. However, male participants mentioned perseverance and task not done (residuals 2.24 and 2.03, respectively) more frequently than female participants. Additionally, single participants (residual = 2.05) mentioned outsourcing tasks significantly more than married participants.

**Environment-related solutions**—The omnibus chi-square analysis was significant for sex,  $\chi^2(1) = 14.86, p < .05$ . Further analysis revealed a difference (residual = 2.85) between men and women for the sub-category, live in apartment or condominium. Men mentioned this category more frequently than women.

## Discussion

By expanding the number of tasks that are relevant to aging in place, we identified an extensive list of home maintenance tasks older adults find difficult to perform. Architects, designers, and home service providers can use this information as a starting point for identifying difficult tasks ripe for intervention. By understanding how older adults are maintaining their homes, designers of person-related and environment-related solutions can enable aging in place.

## Home Maintenance Difficulties

This research broadens the scope of aging in place by focusing on tasks that independently living older adults considered necessary to maintain their homes. The scope was not limited to the elemental activities of maintaining one’s independence, such as toileting or bathing, or to instrumental activities of daily living considered essential to maintaining independence. Prior to this study there was minimal research exploring how older adults maintain their homes. The present data elucidate the tasks that are difficult for older adults to perform.

When older adult participants were asked to describe home maintenance tasks in which they experienced difficulties or could expect to become difficult in the future, men and women

described different tasks, as did married and single participants. Specifically, men described performing more outdoor home maintenance tasks than women, such as cleaning the gutters or painting the exterior of the home. Single participants discussed difficulties in performing heavy housework or physically demanding tasks, such as cleaning floors and changing bed linens, more than married participants.

The married participants might not have viewed heavy housework tasks such as changing bed linens or cleaning floors as difficult because they have a partner to help them perform the tasks. Additionally, a married person might experience more distribution of responsibility within the home with respect to these tasks, thus making the difficulties with these tasks less accessible to either partner. On the other hand, because single participants are the only person residing in the home, they are fully responsible to perform each task, making the difficulty of performing certain tasks more salient.

These results raise awareness of the types of home maintenance tasks that older adult men and women consider difficult to perform or likely to become difficult to perform. Females mentioned maintenance of HVAC systems more frequently than males. Moreover, the fact that men discussed more outdoor tasks than women, and women mentioned more indoor home maintenance tasks than men, indicate that older adult men and women may need support for different types of home maintenance tasks.

### Managing Home Maintenance Difficulties

This research provides insight into how older adults can be supported in performing difficult home maintenance tasks. The solutions identified in this study illustrate areas of need for older adults who can benefit from alternative supports. For example, some participants mentioned not doing a task anymore; certainly, that is not an optimal solution in all cases and might even make a living environment dangerous. Additionally, some participants mentioned moving into condominium or apartment to reduce the workload of home maintenance; again, this may not be an optimal solution if the older adult wants to remain in his or her current home. Thus, highlighting trouble areas for older adults and understanding the nature of the solutions older adults' employ is an important first step in supporting aging in place.

The majority (84.5%) of solutions that participants discussed for managing difficult home maintenance tasks were person-related in nature, compared to 14.3% of the participant responses being environment-related solutions. Outsourcing (a person-related solution) tasks accounted for the majority (53.5%) of all solutions. Men described persevering with difficult tasks more often than women, as well as simply stopping doing tasks altogether. Single participants discussed outsourcing tasks more often than married participants. Women mentioned using tools and technologies to assist in performing difficult tasks more often than men. The finding that tools and technologies were infrequently mentioned by men (less than women) and married individuals (less than single participants) is informative as well. Perhaps these groups have less awareness of available tool and technology supports that could ease home maintenance tasks.

With respect to environment-related solutions, male participants mentioned living in a condominium or apartment more often than female participants. This could be a function of the sampling of participants: More male participants (30%) already lived in apartments or condominiums than the female participants (14%). Thus, this solution may have been more readily accessible for men when the discussion touched upon tasks that are taken care of by management of apartments or condominiums. Most of these solutions were for outdoor tasks and repairs.



If a home is not maintained, it can become a dangerous environment that threatens one's ability to successfully age in place. We sought to understand the specific home maintenance tasks with which older adults experience difficulties as well as their solutions to managing those difficulties. Using these data, future research efforts can target supporting these difficult home maintenance tasks to reduce threat to older adults' independence.

## Conclusion

These results give insight into how home service agencies, as well as other older adult support services can assist specific groups of older adults. Men discussed performing more outdoor tasks than women, and women mentioned more indoor home maintenance tasks than men, indicating that older adult men and women need support for different types of home maintenance tasks. Moreover, single participants described home upkeep tasks, general cleaning tasks, bed maintenance, and cleaning floors as difficult tasks more frequently than married participants further evidencing the different needs among different groups of older adults.

There were also sex and marital status differences for the types of solutions employed by participants. Female participants described using tools and technologies, whereas male participants persevered in difficult tasks, stopped doing the tasks, or moved to an apartment or condominium. Additionally, single participants outsourced more tasks than married participants. The majority of participant responses related to outsourcing difficult tasks; therefore, senior service agencies and organizations should make services easily and readily available to provide support for independently living older adults. Such agencies should also provide older adults with guidance about how to choose trustworthy and reliable service providers. Although the older adults in this study utilized various solutions to manage home maintenance difficulties, there might be more solutions available of which they are not aware. Education and dissemination of such aging-in-place support information is required not only for the older adults themselves but also to senior centers, health care providers, and family members of older adults.

Designers can leverage these data to improve the design of existing home maintenance technologies and to create new technologies, such as service robots, that enable older adults to live in their homes for as long as they desire. For example, robot designers can focus on creating robots that can perform difficult home maintenance tasks such as changing bed linens. Designers can also use these data to modify or develop new environments that reduce demand on the residents. For example, a home that has a self-cleaning furnace filter does not require the resident to maintain it.

These results present opportunities for interventions that can help older adults remain independent in their homes longer. By understanding the nature of home maintenance problems older adults encounter while aging in place, as well as their solutions for managing difficult home maintenance tasks, interventions and redesign efforts can be more effective and address the areas of greatest need. To that end, home service providers, technology developers, home designers, and senior agencies can enable aging in place.

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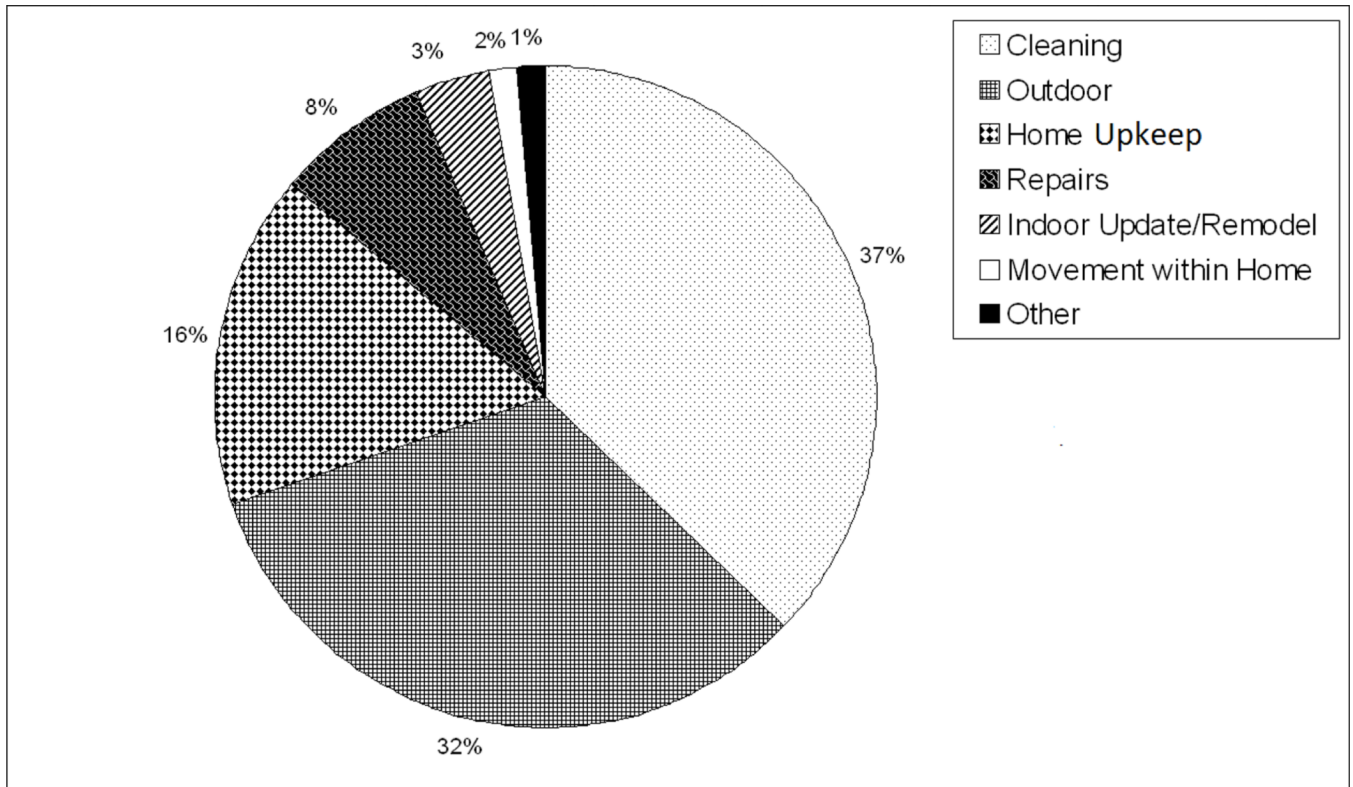
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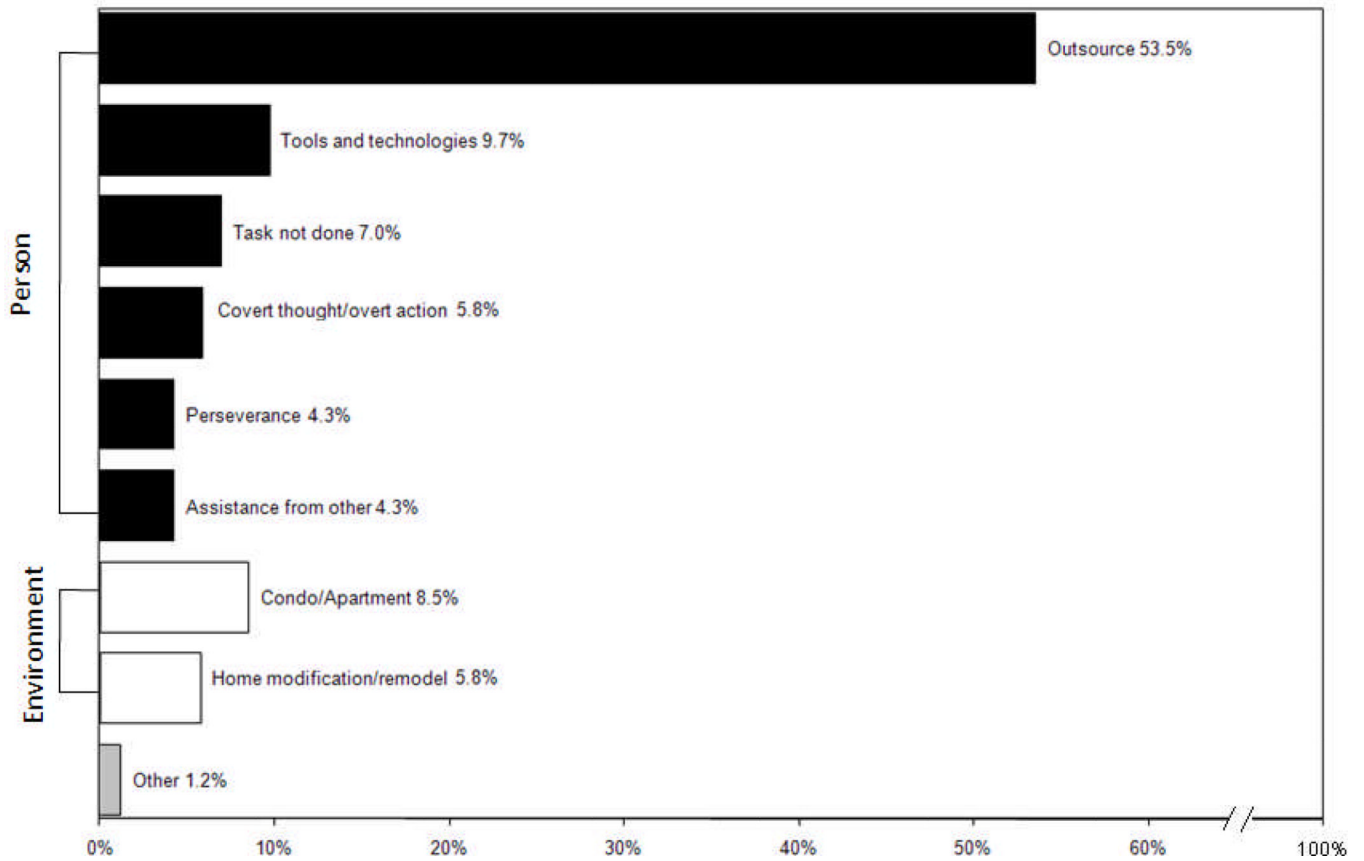
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<b>SEGMENTS</b>		
<ol style="list-style-type: none"> <li>1. "The other chores that I perform to keep my house and put it in shape, I'm satisfied with it. I probably won't go as fast as you but when I say I'm gonna do it, I get it done."</li> <li>2. "I don't do that [vacuum]. My housekeeper does it. My chiropractor says don't do it because of my back."</li> <li>3. "I really need to replace those windows with a double pane so that I don't have that horrible cleaning job hanging over me all the time."</li> </ol>		
<b>CODING SCHEME</b>		
<b>TASK</b>	Cleaning General <sup>1</sup> Floors <sup>2</sup> Bed maintenance Outdoor <sup>3</sup>	Home upkeep Repairs Indoor update/remodel Movement within home Other
<b>DIFFICULTY</b>	General slowing <sup>1</sup> Physical impairment <sup>2</sup> Difficult—not specific <sup>3</sup> Climbing Bending I can't do it Energy	Pain Falling or tripping Arthritis Reaching Balance Strength Other Not mentioned
<b>SOLUTION</b>	<u>Person-related</u> Perseverance <sup>1</sup> Outsource <sup>2</sup> Assistance from other Covert thought/Overt action Task not done Tools and technologies	<u>Environment-related</u> Home modification <sup>3</sup> Live in apartment/condo Other Not mentioned

**Figure 1.** Three examples of how segments were coded on task, difficulty, and solution categories. To illustrate, Segment 1 was coded as a general cleaning task with difficulty due to general slowing and a solution of perseverance.



**Figure 2.** Percentage of types of difficult tasks mentioned for maintaining a home. The total number of comments made referring to a difficult home maintenance task was 316.



**Figure 3.** Percentage of types of solutions mentioned for managing difficult home maintenance tasks. Segments coded as “solution not mentioned” were excluded. Therefore, the total number of coded segments was 258.

Table 1

## Description of Participants

Sex	Marital Status	N	Range	Age		Health <sup>b</sup>		Activities Limited by Health <sup>c</sup>	
				M (SD)	M (SD)	M (SD)	M (SD)		
Female	Single <sup>a</sup>	12	71–82	75.6 (3.5)	3.83 (0.8)	2.11 (1.5)			
Female	Married	12	74–85	79.6 (3.5)	3.25 (1.0)	3.40 (2.0)			
Male	Single <sup>a</sup>	10	71–83	77.6 (4.0)	3.30 (1.2)	2.86 (1.8)			
Male	Married	10	66–78	71.0 (3.5)	3.90 (1.0)	1.33 (1.4)			

<sup>a</sup> Single includes separated, divorced, and widowed.

<sup>b</sup> Self-rated health. 1=Poor and 5=Excellent.

<sup>c</sup> Activities limited by health. 0=No limitation in performing an activity; 1=Some limitation in activity. Maximum summary variable=6.

**Table 2**

## Coding Scheme for Home Maintenance Solutions

Category	Sub-categories	Definition
Person-related solution	Assistance from other	Participant is still attempting to do some part of the task but must use assistance from another person.
	Covert thought/Overt action	Participant describes modifying his/her behavior that results in a change in attitude, covert thought, or overt action.
	Outsource	Participant no longer does the task and instead asks or hires someone to do the task.
	Perseverance	Participant still does the task; however it takes more time and effort to complete.
	Task not done	Participant states that the task is not done.
	Tools and technologies	Participant uses any product that could be purchased and that acts as a prosthesis; supporting or enhancing older adults' abilities.
Environment-related solution	Home Modification/Remodeling	Participant mentions a structural and permanent change to one's home.
	Live in Condominium/Apartment	Participant describes living in a condominium or apartment to reduce the difficulty of performing some home maintenance tasks.
Other	(No sub-categories)	Participant describes a solution to managing a task, but it does not fit in above categories.
Not mentioned	(No sub-categories)	No solution to managing the difficult task was specifically stated.

**Table 3**

Differences Between Groups on Difficult Home Maintenance Tasks Mentioned

Difficult Tasks	More frequently mentioned by			
	Single	Married	Men	Women
Cleaning-Floors	x*			x
Cleaning-General	x*		x	
Cleaning-Bed Maintenance	x*			x
Outdoor-Painting		x*	x*	
Outdoor-Cleaning Gutters		x	x*	
Home Upkeep-HVAC	x			x*

\* Indicates residual > 2.00



**Table 4**

Differences Between Groups on Solutions to Managing Difficult Home Maintenance Tasks

Solutions	More frequently mentioned by			
	Single	Married	Men	Women
Outsource	x*			x
Tools and technologies	x			x*
Task not done		x	x*	
Perseverance	x		x*	
Live in apartment or condo	x		x*	

\* indicates residual &gt; 2.00