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Valued activities among individuals with and without functional impairments: Findings from the National Health and Aging Trends study (NHATS)

Jeanine M. Parisi, PhD,

Johns Hopkins Bloomberg School of Public Health; Center for Innovative Care in Aging

Laken Roberts, MPH,

Johns Hopkins University School of Nursing; Center for Innovative Care in Aging

Sarah L. Szanton, PhD, ANP, FAAN,

Johns Hopkins University School of Nursing; Center for Innovative Care in Aging

Nancy A. Hodgson, PhD, RN, FAA,

University of Pennsylvania School of Nursing; Center for Innovative Care in Aging

Laura N. Gitlin, PhD

Drexel University; College of Nursing and Health Professions; Center for Innovative Care in Aging

Jeanine M. Parisi: jparisi1@jhu.edu; Laken Roberts: lrober50@jhu.edu; Sarah L. Szanton: sszanto1@jhu.edu; Nancy A. Hodgson: hodgsonn@nursing.upenn.edu; Laura N. Gitlin: lng45@drexel.edu

Abstract

Using the National Health and Aging Trends Study (NHATS), we examined baseline activity and functional status. Respondents were classified as High (n=1,662), Moderate (n=1,973), or Low (n=989) Function and rated importance of and actual participation in four activities. Transportation and health were also examined. Individuals classified as low function were less likely to engage in valued activities and more likely to report that poor health and transportation limited participation, compared to individuals with no or moderate functional impairments. Data suggest the importance of developing interventions which bridge the gap between activity preferences and participation for older adults with functional limitations.

Keywords

Activity; Engagement; Physical Impairment

As the population ages, the likelihood of a greater number of older individuals with functional limitations is also expected (Erikson, Lee, & von Schrader, 2018; Freedman, 2018), resulting in subsequent impairments in physical, cognitive, and mental health (Clegg, Young, Iliffe, Olde Rikkert, & Rockwood, 2013; Farias, Lau, Harvey, Denny, Barba, & Mefford, 2017), institutionalization (Freedman & Spillman, 2014), as well as an increased

risk of mortality (Hardy, Perea, Roumani, Chandler, & Studenski, 2007; Studenski et al., 2010). Thus, a major public health challenge is to identify ways to maintain health and function, well into advanced age through modifiable lifestyle factors (Anderson, Goodman, Holtzman, Posner, & Northridge, 2012).

Continued engagement in personally valued activities, including participation in family, spiritual, and community-based activities, may buffer against physical declines associated with aging (Adams, Leibbrandt, & Moon, 2011; James, Boyle, Buchman, & Bennett, 2011; Kanamori et al., 2014; Rosso, Taylor, & Tabb, 2013; Shankar, McMunn, Deakakos, Hamer, & Steptoe, 2017; Shah, Lin, Yu, & McMahon, 2017), and consequently, promotes well-being and better quality of life (Sharifian, & Grün, 2018; Vozikaki, Linardakis, Micheli, & Philalithis, 2017). This relationship, however, is most likely reciprocal such that functional limitations may also prevent individuals from engaging in the activities that hold the most importance in their lives. Moreover, individuals with functional limitations may also have mobility limitations, including walking and driving, restricting their ability to participate in activities outside of the home due to transportation issues or poor health (Ashe, Miller, Eng, & Noreau, 2009; Marottoli, Mendes de Leon, Glass, Williams, Cooney, & Berkman, 2000). In fact, older adults with mobility difficulties are less likely to have regular social contacts (Mezuk & Rebok, 2008) and more sedentary time (Davis, Fox, Stathi, Trayers, Thompson, & Cooper, 2014; Dunlop, Song, & Arnston, 2015). Nevertheless, Szanton and colleagues found that despite functional limitations, large percentages of homebound and semi-homebound older adults seek to participate in family and community life (Szanton, Roberts, et al., 2016). This is consistent with earlier work by Szanton and colleagues (2015) showing that, although older adults self-reported favorite activities were overwhelmingly active (e.g., walking or jogging, gardening), those who reported poor health were more likely to endorse a non-physical favorite activity (i.e., reading, television watching) than those who reported being in better health. In addition, for each increase in the number of self-care limitations, older adults were 29% more likely to endorse a non-physical activity as their favorite activity, controlling for race, income and age. Together, these findings suggest that activity restriction may be more strongly related to functional limitations than with aging itself (Paggi, Jopp, & Hertzog, 2016).

The motivational theory of life-span development, which provides the backdrop for this study, explains how individuals evaluate their values and behaviors in order to optimally pursue their intended goals (Heckhausen, Wrosch, & Schulz, 2010). This evaluation process allows an individual to determine whether the goal is or is not attainable, as well as how to best modify the goal given available resources and opportunities for goal pursuit. In the context of activity engagement, some individuals may attribute less importance to activities which are no longer performed as a means of maintaining congruence between their activity values and behaviors; whereas, others may struggle with such discrepancies which, in turn, may be more detrimental to health and well-being (Heckhausen et al., 2010; Wrosch, Miller, Scheier, & de-Pontet, 2007). According to this theoretical framework, primary and secondary control strategies work in concert to maximize self-regulation of goal attainment (Heckhausen et al., 2010). Primary control often involves changing the environment to fit an individual's current capacity; whereas secondary control involves changing oneself to meet environmental demands. Both primary and secondary control strategies can be further

defined as selective or compensatory. Selective primary control strategies target external behavioral resources (e.g., spending more time and effort engaged in activity); whereas compensatory primary control strategies are required when an individual no longer possesses the physical or cognitive capacities required for goal attainment (e.g., asking friends and family for assistance) (Heckhausen et al., 2010). In contrast, selective secondary control strategies target internal motivational and affective resources relevant to goal pursuit (e.g., attributing importance to activity), with compensatory secondary control strategies buffering against failure to successfully implement primary control strategies (e.g., goal disengagement) (Heckhausen et al., 2010). In the face of age-related limitations, older individuals may need to actively enact both primary and secondary control strategies to successfully adapt to changing life circumstances (Heckhausen et al., 2010) so as to remain actively engaged well into late adulthood. The health effects of primary and secondary control strategies and continued engagement in valued activities have been well documented (Gitlin, Hauck, Dennis, & Schulz, 2007; Heckhausen et al., 2010).

Unfortunately, only a few studies have examined the relationship between functional status and activity participation among older adults and the particular role of transportation and health in preventing participation (Choi, Tang, Kim, & Turk, 2016; Dahan-Oliel, Mazer, Gelinias, Dobbs, & Lefebvre, 2010; Everard, Latch, Fisher, & Baum, 2000; Idler & Kasl, 1997; Janke, Payne, & Van Puymbroeck, 2008), with the exception of physical activities (Boyle, Buchman, Wilson, Bienias, & Bennett, 2007; Tak, Kuiper, Chorus, & Hopman-Rock, 2013). Further, when the associations between physical function and activity have been investigated, most studies have focused on the predictive value of physical function on subsequent difficulty with basic, self-care activities of daily living (ADLs) (Gill, Williams, & Tinetti, 1995; Gill, Allore, Holford, & Guo, 2004; Guralnik et al., 2000; Huang, Perera, Van Swearingen, & Studenski, 2010; Vaughan, Leng, La Monte, Tindle, Cochrane, & Shumaker, 2016), neglecting the full range of activities that may be personally valued among older adults. Among the handful of studies examining activity engagement in later life (as opposed to mandatory tasks of daily living), studies show that having a large number of social ties and continued engagement in valued activities is protective against age-related functional decline (Buchman et al., 2009; James et al., 2011; Kanamori et al., 2014; Mendes de Leon, Glass, & Berkman, 2003; Mendes de Leon & Rajan, 2014; Unger, Johnson, & Marks, 1997; Unger, McAvay, Bruce, Berkman, & Seeman, 1999). In addition, greater religious involvement is related to increased physical function (Park et al. 2008; Hybels, Blazer, George, & Koenig, 2012); however, studies have also shown that mobility limitations decrease probability of religious attendance (Sowa et al., 2016). Other research has shown that it is the inability to continue participation in valued activities versus having a functional impairment itself that contributes to additional negative consequences, such as depression (Williamson, Shaffer, & Schulz, 1998). Another significant limitation of previous research in this area is the lack of inclusion of a representative population-based sample.

Given the limited research on functional status and participation in diverse social, spiritual, and community-based activities as well as the lack of inclusion of large-scale population-based samples, the present study uses the National Health and Aging Trends Study (NHATS), a large nationally representative sample, to examine valued activities for three functional status groups (high, moderate, low function), comparing valued activities to actual

participation, and exploring two potential barriers to activity participation previously identified in the literature, transportation and health. Specifically, we sought to determine if older adults with functional impairments valued activities but participated less and whether this group reported transportation and health as barriers to their participation more so than older adults without physical functional impairments. This study builds on our previous study showing that cognitive impairment impacts participation although activities remain highly valued (Parisi, Roberts, Szanton, Hodgson, & Gitlin, 2017). Here we seek to understand the specific role of functional impairment in cognitively intact older adults in participation in valued activities. Understanding the relationship of functional status to activity participation would provide foundational knowledge for advancing targeted interventions.

Methods

Data for this study were collected as part of the baseline assessment in NHATS, a nationally representative sample of Medicare beneficiaries ages 65 and older (N=8,245). Briefly, NHATS was designed to collect detailed information on participants' physical and cognitive capacity, the extent of participation in daily activities, living arrangements, economic status, and well-being. Detailed information regarding the study design has been described elsewhere (see Montaquila, Freedman, Edwards, & Kasper, 2012).

Sample

For purposes of the present analyses, the sample consisted of cognitively-healthy, community-dwelling respondents with complete baseline data for valued activity questions and performance scores on the Short Physical Performance Battery (SPPB). NHATS respondents were excluded if they were classified as having possible or probable cognitive impairment, lived in a nursing home or other residential facility, or relied on a proxy respondent to answer the Round 1 survey questions. Of the initial 8,245 NHATS respondents, 4,624 individuals were eligible for inclusion in these analyses and classified into three groups varying in functional status—High Function (n=1,662), Moderate Function (n=1,973), and Low Function (n=989) according to performance scores on the SPPB. The SPPB total score can range from 0 (not attempted) to 12 (best performance) and represents combined performance on three standing balance tests (side by side, semi-tandem, and full-tandem), repeated chair stands (5 times) and walking speed on a 3-m course, allowing walking aids; all measures of mobility and lower extremity strength. The SPPB has demonstrated good reliability (Cronbach's $\alpha = 0.60\text{--}0.83$), as well as high predictive validity with respect to mortality, ADL difficulty, difficulty in walking, and disability in upper extremity performance (Freiberger et al., 2012; Guralnik et al., 1994). We followed established guidelines within NHATS to determine scores for each classification: Low function (0–4), Moderate function (5–8), and High function (9–12) (Sun, Huang, Varadhan, & Agrawal, 2016). NHATS instruments are available online: <https://www.nhats.org>.

Measures

Valued activities, participation, and barriers.—Respondents were asked to indicate the importance of participating in four elective activities: visiting in-person with friends and

family, attending religious services, participating in clubs, classes, or other organized activities, and going out for enjoyment (e.g., dinner, see a movie, play, or concert). These activities were selected to capture participation in elective activities, as opposed to instrumental or household activities (Freedman, 2009; Jette, 2009). The importance of each activity was rated on a three-point scale: 1 = very important, 2 = somewhat important, 3 = not so important. We considered activities rated as “very important” to be of greatest personal value to the individual (see also Parisi et al., 2017).

Respondents were also asked if they ever participated in the four activities in the last month (Yes/No). For each, respondents were asked whether difficulty in health or transportation kept them from participating (Yes/No).

Statistical Analyses

We first examined the percentage of responses for valued activities (i.e., those reported as being very important) across the three categories of functional status (high, moderate, low function). If any of the four activities (visiting with friends and family, attending religious services, participating in clubs/classes, and going out for enjoyment) were rated as very important, we also examined whether or not the activity was performed in the last month (Yes/No) and, if not performed, whether health limitations or difficulty with transportation limited participation in the activity. In addition to examining each activity individually, we also examined responses across all activities by creating a variable to reflect if any of the four activities were endorsed, regardless of activity type.

For analyses, chi-square tests were conducted to evaluate differences in activity importance, activity performance, and limitations among the three levels of functional status (high, moderate, low function). NHATS survey weights were included to generalize to the national sample and adjust for the survey design features of NHATS. Analyses were performed using Stata 13.1 (Stata Corp, College Station, TX).

Results

Sample demographic characteristics

Overall, respondents (N=4,624) ranged in age from 65 to 105 years (M=73.69; SD=6.01), with 56.1% female (n=2,594), 84.8% White, Non-Hispanic (n=3,921), and 15.8% having less than a high school education (n=731). In addition, approximately 74% reported living with others (n=3,403) and 81% of respondents rated their health as excellent, very good, or good (n=3,759).

Attributed value for activity participation

Overall, 85.26% of individuals reported at least one of the four valued activities as being very important (Table 1). Compared to other activities, visiting with friends or family held the most importance in people’s lives (66.32%), followed by attending religious services (52.80%), going out for enjoyment (49.85%), and participation in clubs, classes, or other organized activities (33.11%) (Table 1).

However, there were clear differences between the three functional status groups as to rate of endorsement. Regardless of activity type, a slightly higher percentage of individuals with no (87.43%) or moderate (84.80%) impairments attributed more importance to activity participation than individuals with low functional status (80.45%) ($p < 0.01$). When specific activities were examined, a higher percentage of those without functional impairment attributed importance to visiting with friends and family (70.88%); participation in clubs/classes (39.59%); and going out for enjoyment (57.67%) ($ps < 0.001$; Table 1); whereas, those with moderate impairments reported slightly lower percentages (visiting (65.19%); clubs/classes (29.25%); going out (46.13%); and those with the most impairments attributed the lowest percentages of importance to each of these activities (visiting (56.65%); clubs/classes (25.03%); going out (37.74%)) ($ps < 0.001$; Table 1). For each of the four valued activities, significant differences were found between all functional group comparisons, with the exception of notable differences between individuals with moderate and low function for attending clubs and classes ($p > 0.05$). In addition, for attending religious services, individuals across the three groups generally rated the importance of this activity similarly, with the exception of a significant difference between individuals with no impairments (49.90%) and those with moderate (55.65%) function ($p < 0.01$; Table 1).

Actual participation in each of the four valued activities

Overall, most respondents remained actively engaged, with only 14.54% of the total study sample reporting no participation in valued activities during the past month. For the entire study sample regardless of functional level, 13.80% did not participate in clubs/classes, 9.73% did not attend religious services, 4.52% did not go out for enjoyment, and 4.20% did not visit in person with friends and family (Table 1).

As to functional levels, a greater percentage (25.93%) of individuals with low functional status reported that they did not engage in any of the four valued activities during the past month compared to those with no (10.14%) or moderate functional impairments (15.19%) ($ps < 0.001$; Table 1). Group differences were also found for endorsement of any activity (regardless of type), as well as for visiting with friends and family, attending religious services, and going out for enjoyment between those with no and moderate impairments, with a higher percentage of those classified as having moderate functional status reporting no engagement compared to the high functional status group ($ps < 0.0001$; Table 1).

Transportation and health as barriers to participation in valued activity

Transportation.—A greater percentage of individuals classified as having low functional status (17.25%) reported that transportation limited engagement in each of the activities during the past month compared to those with no (2.01%) or moderate (3.93%) functional impairments ($ps < 0.05$; Table 2). No statistically significant differences were found between those with high or moderate functional ability ($ps > 0.05$), however, we found a trend for visiting with friends and family (0.00% high function vs. 3.30% moderate function) and attending religious services (4.00% high function vs. 7.41% moderate function), with individuals with no or few impairments reporting less limitations in transportation than those with moderate impairments (Table 2).

Health.—Individuals at the lowest functional level reported more health-related limitations for ceasing participation in valued activity (regardless of type), as well as for each of the four individual activities ($p < 0.001$; Table 2). A lower percentage of those in the high function category reported health as a limitation to activity participation compared to those with moderate impairments: visiting with friends and family (3.36% vs. 6.29%), attending religious services (11.13% vs. 21.55%), participating in classes/clubs (9.98% vs. 19.32%), and going out for enjoyment (8.5% vs. 22.49%) ($p > 0.05$; Table 2).

Discussion

Regardless of functional status, and consistent with other studies (Szanton, Roberts, et al., 2016), most individuals value opportunities for activity engagement (visiting friends and family, religious services, participating in clubs/classes, going out for enjoyment). For older adults with functional impairments, however, a gap exists between what activities are valued and actual participation in those activities. Other work has similarly shown reduced activity participation among individuals with greater medical conditions, mobility impairments, and activity limitations (Janke, Davey, & Kleiber, 2006; Nilsson, Nyqvist, Gustafson, & Nygard, 2015; Rosso et al., 2013). Our findings extend those of previous studies by using a national probability sample, having a larger sample size, using an objective measure of functional limitation to categorize the sample, and examining higher order social activities versus activities of daily living.

Gaining a better understanding of the types of activities valued by older adults and whether they are participating in valued activities is important for several reasons. First, activity participation may actually slow the progression of functional decline. For instance, a study by Buchman and colleagues (2009) found that for every 1-point decrement in valued social activity at baseline, there was a corresponding 33% increased rate of subsequent decline in motor functioning. Although the reasons for reducing or ceasing participation are unclear, it may be that older adults with difficulties in physical function may selectively engage in less-demanding and more sedentary activities (i.e., secondary compensatory control strategy involving downgrading important activities to adjust to physical abilities). Alternately, older adults with functional difficulties may avoid activity participation entirely, as a means of avoiding pain or discomfort or to conserve energy for engaging in daily tasks necessary for self-care and home maintenance. In accordance with the motivational theory of life-span development, once goals are no longer attainable (because of functional losses), goal disengagement may be a necessary and successful means of adaptation, in which existing resources are allocated in such a way to avoid further losses and maintain health and well-being (Heckhausen et al., 2010). However, given the benefits of remaining actively engaged on functional health and well-being (Adams et al., 2011; James et al., 2011), examining the barriers and facilitators to keep older adults engaged in personally valued activities is of great import.

Although many factors may contribute to the gap between personal value and actual participation in a specific activity, we were only able to examine transportation and health as two potential barriers to activity participation. Across the total sample, 6.93% of individuals reported that transportation limited activity participation in the past month; whereas, 24.76%

reported that health limited activity participation in the past month. Consistent with previous research, older adults with the most severe functional impairment level were most susceptible to these barriers (Ashe et al., 2009; Campbell et al., 1993), reporting that reduced participation in each of the four valued activities was due, in part, to limitations in health and transportation. However, a limitation of this study is that we were unable to fully examine the specific transportation or health issues that contributed to limited activity participation. For instance, we were unable to determine whether endorsement of transportation issues was related to inability to drive safely, unavailability of public transportation, or the lack of mobility services for low functioning individuals. Living circumstances, such as rural or urban environment, possibilities of public transport, proximity to family, and ability to drive a car, could potentially exert a major influence on activities and participation. We also did not have data regarding compensatory primary control strategies, such as asking friends and family for assistance with transportation. Further research is warranted to better understand the role of each of these barriers in limiting activity engagement in later life, as well as the use of compensatory strategies to overcome such challenges.

Together, our findings have important implications for intervention and policy development. For instance, several intervention strategies can be implemented to minimize the effects of functional limitations. These include home-based programs enabling older adults to achieve their activity goals (e.g., Gitlin, Winter, Dennis, Corcoran, Schinfeld, & Hauck, 2006; Szanton, Leff, et al., 2016), or referral to occupational therapists who are specifically trained in helping older adults tailor activities to their functional level, as well as overcome barriers to activity participation through use of a wide range of strategies, including compensatory techniques (Szanton, Leff, et al., 2016). As we found that older adults with functional impairments have a desire to continue participating in meaningful activity, it may be beneficial to provide extra support and assistance for attending and maintaining participation for this group. Further, at the policy level, occupational therapist led interventions that teach or support self-management techniques for older adults with physical impairments may enable individuals to devise or advocate for adaptation of activities and environments.

Further, given that both health and transportation were barriers to participation, addressing unmet health needs and providing a range of transportation options (from accepting rides from friends and family to car service options) may help older adults remain actively engaged. However, since individuals with disability are more likely to live in poverty, they may not be able to pay for transportation services or take proper care of health in order to participate in leisure activities. Disparities in well-being have been mitigated in nations that provide income support and has important implications for disability policies at the national level (Burkhauser, Daly, McVicar, & Wilkins, 2014). We recognize, however, that even if these barriers are adequately addressed, participation in activities outside of the home may still be difficult for some individuals. For instance, renovations to the home environment may need to first be addressed, including repairing broken steps leading out the front door (if any) so that they are useable for people with limited function (Szanton, Leff, et al., 2016). Moreover, sometimes providing transportation itself will not be helpful in increasing activity participation, if an individual cannot get dressed easily to go out or the driver cannot help the older adult down the stairs. For cases in which an individual has severe health or mobility limitations, activities and services may need to be brought into the home---either through in-

person visits or through the use of technology---so as to keep the individual active and socially engaged. In turn, greater activity participation may result in a variety of cognitive, physical, and mental health benefits (Adams et al., 2011; Gitlin, Szanton, & Hodgson, 2013; James et al., 2011).

This study has several important strengths, including a large, nationally representative sample with varying levels of functional ability as defined by an objective physical performance measure (rather than self-report). However, results must be interpreted alongside several limitations. First, we were limited by the items included in the NHATS dataset. For instance, only four activities (visiting friends and family, attending religious services, participating in clubs, classes, and other organizations, and going out for enjoyment) were included that allowed us to examine the level of importance attributed to the specific activity, which does not adequately represent the diverse repertoire of activities that older adults may value and perform. Likewise, only health and transportation were available to examine as barriers, neglecting other reasons why an individual may cease to continue an activity. For instance, financial status may also impact extent of activity participation. Importantly, individuals with disability are more likely to live in poverty than those without, which is likely to affect ability to pay for participation in valued activities (Brucker, Mitra, Chaitoo, & Mauro, 2013). In addition, given the response option (yes/no) for whether an individual participated in a specific activity, as well as whether health or transportation limited them from participating, we do not know the extent of participation or how often such barriers kept them from engaging with each of these activities. Second, although NHATS represents a nationally representative, population-based sample of Medicare beneficiaries, this sampling frame may not be representative of the population as a whole. Those not enrolled in Medicare may include individuals who were born in another country and never qualified for Social Security benefits in the United States and persons who defer Medicare enrollment because of continued health insurance coverage through an employer (Freedman & Spillman, 2015). However, it should be noted that the Medicare enrollment database used to generate the sampling frame included approximately 96% of all older adults living in the United States (Freedman & Spillman, 2015). Lastly, the cross-sectional nature of our data does not allow us to examine directionality. For instance, those with low functional ability indicated that fewer activities were important to them, as well as participated in fewer activities. The direction of this relationship is not clear and most likely is bi-directional. It may be that older adults adapt to having a functional impairment by modifying their activity goals and what they value, using secondary selective and compensatory strategies to cope (e.g., motivational theory of lifespan development). Persons who have experienced disability over a longer time period may differ from persons who have either temporary disabilities or who have recently experienced the onset of a long-term disability. Additional longitudinal research is warranted to disentangle the complexities between functional ability and activity participation over time.

In summary, older adults with and without functional limitations value activities, although actual participation tends to decrease with increased functional limitations. In this, descriptive, cross-sectional analysis, we could not determine whether functional decline is a direct cause of limited activity performance or vice versa. Given the importance of remaining actively engaged later in life, modifications to both the activity and the

environment will likely increase activity in valued activities and reduce barriers. As such, the ability to continue participating in meaningful activity engagement may reduce the likelihood of transitioning into more advanced stages of functional decline, thereby improving the health and well-being of a rapidly aging population. With the aging population, and the knowledge that meaningful engagement can delay disability, it is in the nation's interest to understand barriers to activity and remove them.

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References

- Adams KB, Leibbrandt S, & Moon H (2011). A critical review of the literature on social and leisure activity and wellbeing in later life. *Ageing and Society*, 31, 683–712.
- Anderson LA, Goodman RA, Holtzman D, Posner SF, & Northridge ME (2012). Aging in the United States: Opportunities and challenges for public health. *American Journal of Public Health*, 102, 393–395. [PubMed: 22390500]
- Ashe MC, Miller WC, Eng JJ, Noreau L, & physical activity and chronic conditions research team (2009). Older adults, chronic disease and leisure-time physical activity. *Gerontology*, 55, 64–72. [PubMed: 18566534]
- Boyle PA, Buchman AS, Wilson RS, Bienias JL, & Bennett DA (2007). Physical activity is associated with incident disability in community-based older persons. *Journal of the American Geriatric Society*, 55, 195–201.
- Brucker D, Mitra S, Chaitoo N, & Mauro J (2013). More likely to be poor whatever the measure: Persons with disabilities in the US. *Social Science Quarterly*, 96, 273–296.
- Buchman AS, Boyle PA, Wilson RS, Fleischman DA, Leurgans S, & Bennett DA (2009). Association between late-life social activity and motor decline in older adults. *Archives of Internal Medicine*, 169, 1139–1146. [PubMed: 19546415]
- Burkhauser RV, Daly MC, McVicar D, & Wilkins R (2014). Disability benefit growth and disability reform in the US: Lessons from other OECD nations. *Journal of Labor Policy*, 3, 1–30.
- Campbell MK, Bush TL, & Hale WE (1993). Medical conditions associated with driving cessation in community dwelling, ambulatory elders. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 48, 230–234.
- Choi E, Tang F, Kim S-G, & Turk P (2016). Longitudinal relationships between productive activities and functional health in later years: A multivariate latent growth curve modeling approach. *The International Journal of Aging and Human Development*, 83, 418–440. [PubMed: 27461262]
- Clegg A, Young J, Iliffe S, Olde Rikkert M, & Rockwood K (2013). Frailty in elderly people. *Lancet*, 381, 752–762. [PubMed: 23395245]
- Dahan-Oliel N, Mazer B, Gelinas I, Dobbs B, & Lefebvre H (2010). Transportation use in community-dwelling older adults: association with participation and leisure activities. *Canadian Journal of Ageing*, 29, 491–502.
- Davis MG, Fox KR, Stathi A, Trayers T, Thompson JL, & Cooper AR (2014). Objectively measured sedentary time and its association with physical function in older adults. *Journal of Aging and Physical Activity*, 22, 474–481. [PubMed: 24085473]
- Dunlop D, Song J, Arnston EK, Semanik PA, Lee J, Chang RW, & Hootman JM (2015). Sedentary time in U.S. older adults associated with disability in activities of daily living independent of physical activity. *Journal of Physical Activity and Health*, 12, 93–101. [PubMed: 24510000]
- Erikson W, Lee C, and von Schrader S (2018). 2016 Disability Status Report: United States. Ithaca, NY: Cornell University Yang-Tan Institute on Employment and Disability (YTI) Available: <http://www.disabilitystatistics.org>.

- Everard KM, Lach HW, Fisher EB, & Baum MC (2000). Relationship of activity and social support to the functional health of older adults. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 55, 208–212.
- Farias ST, Lau K, Harvey D, Denny KG, Barba C, & Mefford AN (2017). Early functional limitations in cognitively normal older adults predict diagnostic conversion to mild cognitive impairment. *Journal of the American Geriatric Society*, 65, 1152–1158.
- Freedman VA (2009). Adopting the ICF language for studying late-life disability: A field of dreams? *The Journals of Gerontology: Medical Sciences*, 64, 1172–1174.
- Freedman VA (2018). The demography of late-life disability In Hayward MD & Majmundar MK (Eds.), *Future directions for the demography of aging: Proceedings of a workshop* (pp. 269–309). Washington, DC: The National Academics Press.
- Freedman VA, & Spillman BC (2014). The residential continuum from home to nursing home: Size, characteristics and unmet needs of older adults. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 69, 42–50.
- Freedman VA, & Spillman BC (2016). Making National Estimates with the National Health and Aging Trends Study (NHATS Technical Paper #17). Retrieved from www.nhats.org.
- Freiberger E, De Vreede P, Schoene D, Rydwick E, Mueller V, Frändin K, & Hopman-Rock M (2012). Performance-based physical function in older community-dwelling persons: A systematic review of instruments. *Age and Ageing*, 41, 712–721. [PubMed: 22885845]
- Gill TM, Allore H, Holford TR, & Guo Z (2004). The development of insidious disability in activities of daily living among community-living older persons. *American Journal of Medicine*, 117, 484–491. [PubMed: 15464705]
- Gill TM, Williams CS, & Tinetti ME (1995). Assessing risk for the onset of functional dependence among older adults: The role of physical performance. *Journal of the American Geriatric Society*, 43, 603–609.
- Gitlin LN, Hauck WW, Dennis MP, & Schulz R (2007). Depressive symptoms in older African-American and White adults with functional difficulties: The role of control strategies. *Journal of the American Geriatric Society*, 55, 1023–1030.
- Gitlin LN, Szanton SL, & Hodgson NA (2013). It's complicated—But doable: The right supports can enable elders with complex conditions to successfully age in community. *Generations*, 37, 51–61.
- Gitlin LN, Winter L, Dennis MP, Corcoran M, Schinfeld S, & Hauck WW (2006). A randomized trial of a multi-component home intervention to reduce functional difficulties in older adults. *JAGS*, 54(5), 809–816.
- Gitlin LN, Winter L, Dennis MP & Hauck WW (2008). Variation in response to a home intervention to support daily function by age, race, sex, and education. *Journal of Gerontology: Medical Sciences*, 63, 745–750.
- Guralnik JM, Ferrucci L, Pieper CF, Leveille SG, Markides KS, Ostir GV, ... Wallace RB (2000). Lower extremity function and subsequent disability: Consistency across studies, predictive models, and value of gait speed alone compared with the short physical performance battery. *The Journals of Gerontology: Medical Sciences*, 55, 221–231.
- Guralnik JM, Simonsick EM, Ferrucci L, Glynn RJ, Berkman LF, Blazer DG, ... Wallace RB (1994). A short physical performance battery assessing lower extremity function: Association with self-reported disability and prediction of mortality and nursing home admission. *The Journals of Gerontology: Medical Sciences*, 49, 85–94.
- Hardy SE, Perera S, Roumani YF, Chandler JM, & Studenski SA (2007). Improvement in usual gait speed predicts better survival in older adults. *Journal of the American Geriatric Society*, 55, 1727–1734.
- Heckhausen J, Wrosch C, & Schulz R (2010). A motivational theory of life-span development. *Psychological Review*, 117, 32–60. [PubMed: 20063963]
- Huang W-N, Perera S, VanSwearingen J, & Studenski S (2010). Performance measures predict the onset of basic ADL difficulty in community-dwelling-older adults. *Journal of the American Psychiatric Society*, 58, 844–852.

- Hybels C, Blazer D, George L, & Koenig H (2012). The complex association between religious activities and functional limitations in older adults. *The Gerontologist*, 52, 676–685. [PubMed: 22403163]
- Idler EL, & Kasl SV (1997). Religion among disabled and nondisabled persons: Attendance at religious services as a predictor of the course of disability. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 52, 306–316.
- James BD, Boyle PA, Buchman AS, & Bennett DA (2011). Relation of late-life social activity with incident disability among community-dwelling older adults. *The Journal of Gerontology: Medical Sciences*, 66, 467–473.
- Janke M, Davey A, & Kleiber D (2006). Modeling change in older adults' leisure activities. *Leisure Science*, 28, 285–303.
- Janke MC, Payne LL, & Van Puymbroeck M (2008). The role of informal and formal leisure activities in the disablement process. *International Journal of Aging & Human Development*, 67, 231–257. [PubMed: 19049245]
- Jette AM (2009). Toward a common language of disablement. *The Journal of Gerontology: Medical Sciences*, 64, 1165–1168.
- Kanamori S, Kai Y, Aida J, Kondo K, Kawachi I, Hirai H, ... Suzuki K The JAGES Group. (2014). Social participation and the prevention of functional disability in older Japanese: The AGES cohort study. *PLoS ONE*, 9, Article e99638.
- Marottoli RA, Mendes de Leon CF, Glass TA, Williams CS, Cooney LM, & Berkman LF (2000). Consequences of driving cessation: Decreased out-of-home activity levels. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 55, 334–340.
- Mendes de Leon CF, Glass TA, & Berkman LF (2003). Social engagement and disability in a community population of older adults the New Haven EPESE. *American Journal of Epidemiology*, 157, 633–642. [PubMed: 12672683]
- Mendes de Leon CF, & Rajan KB (2014). Psychosocial influences in onset and progression of late life disability. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 69, 287–302. [PubMed: 24389123]
- Mezuk B, & Rebok GW (2008). Social integration and social support among older adults following driving cessation. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 63, 298–303.
- Montaquila J, Freedman VA, Edwards B, & Kasper JD (2012). National Health and Aging Trends Study Round 1 sample design and selection (NHATS Technical Paper #1). Retrieved from <http://www.nhats.org>.
- Nilsson I, Nyqvist F, Gustafson Y, & Nygard M (2015). Leisure engagement: Medical conditions, mobility difficulties, and activity limitations—A later life perspective. *Journal of Aging Research*, 2015, Article 610154.
- Paggi ME Jopp D & Hertzog C (2016). The importance of leisure activities in the relationship between physical health and wellbeing in a life span sample. *Gerontology*, 62, 450–458. [PubMed: 26974682]
- Parisi JM, Roberts L, Szanton SL, Hodgson NA, & Gitlin LN (2017). Valued activities among individuals with and without cognitive impairments: Findings from the National Health and Aging Trends Study. *The Gerontologist*, 57, 309–318. [PubMed: 26608334]
- Park NS, Klemmack DL, Roff LL, Parker MW, Koenig HG, Sawyer P, & Allman RM (2008). Religiousness and longitudinal trajectories in elders' functional status. *Research in Aging*, 30, 279–298.
- Rosso AL, Taylor JA, Tabb LP, & Michael YL (2013). Mobility, disability, and social engagement in older adults. *Journal of Aging and Health*, 25, 617–637. [PubMed: 23548944]
- Shah KN, Lin FV, Yu F, & McMahon JM (2017). Activity engagement and physical function in old age sample. *Archives of Gerontology and Geriatrics*, 69, 55–60. [PubMed: 27888736]
- Shankar A, McMunn A, Demakakos P, Hamer M, & Steptoe A (2017). Social isolation and loneliness: Prospective associations with functional status in older adults. *Health Psychology*, 36, 179–187. [PubMed: 27786518]

- Sharifian N, & Grün D (2018). The differential impact of social participation and social support on psychological well-being: Evidence from the Wisconsin Longitudinal Study. *The International Journal of Aging and Human Development*. Advance online publication. doi: 10.1177/0091415018757213.
- Sowa A, Golinowska S, Deeg D, Principi A, Casanova G, Schulmann K, ... Gelenkamp H (2016). Predictors of religious participation of older Europeans in good and poor health. *European Journal of Ageing*, 13, 145–157. [PubMed: 27358605]
- Studenski S, Perera S, Patel K, Rosano C, Faulkner K, Inzitari M, ... Guralnik J (2011). Gait speed and survival in older adults. *Journal of the American Medical Association*, 305, 50–58. [PubMed: 21205966]
- Sun DQ, Huang J, Varadhan R, & Agrawal Y (2016). Race and fall risk: Data from the National Health and Aging Trends Study (NHATS). *Age Ageing*, 45, 120–127. [PubMed: 26764401]
- Szanton SL, Leff B, Wolff JL, Roberts L, & Gitlin LN (2016). Home-based care program reduces disability and promotes aging in place. *Health Affairs*, 35, 1558–1563. [PubMed: 27605633]
- Szanton SL, Roberts L, Leff B, Walker JL, Seplaki CL, Soones T, Thorpe RJ, Ornstein KA (2016). Home but still engaged: Participation in social activities among the homebound. *Quality of Life Research*, 25, 1913–1920. [PubMed: 26883818]
- Szanton SL, Walker RK, Roberts L, Thorpe RJ, Wolff J, Agree E, ... Seplaki C (2015). Older adults' favorite activities are resoundingly active: Findings from the NHATS study. *Geriatric Nursing*, 36, 131–135. [PubMed: 25619566]
- Tak E, Kuiper R, Chorus A, & Hopman-Rock M (2013). Prevention of onset and progression of basic ADL disability by physical activity in community dwelling older adults: A meta-analysis. *Ageing Research Reviews*, 12, 329–338. [PubMed: 23063488]
- Unger JB, Johnson CA, & Marks G (1997). Functional decline in the elderly: Evidence for direct and stress-buffering protective effects of social interactions and physical activity. *Annals of Behavioral Medicine*, 19, 152–160. [PubMed: 9603690]
- Unger JB, McAvay G, Bruce ML, Berkman LF, & Seeman T (1999). Variation in the impact of social network characteristics on physical functioning in elderly persons: MacArthur Studies of Successful Aging. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, 54, 245–251.
- Vaughan L, Leng X, La Monte MJ, Tindle HA, Cochrane BB, & Shumaker SA (2016). Functional Independence in late-life: Maintaining physical functioning in older adulthood predicts daily life function after age 80. *The Journal of Gerontology: Medical Sciences*, 71, 79–86.
- Vozikaki M, Linardakis M, Micheli K, & Philalithis A (2017). Activity participation and well-being among European adults aged 65 years and older. *Social Indicators Research*, 131, 769–795.
- Williamson GM, Shaffer DR, & Schulz R (1998). Activity restriction and prior relationship history as contributors to mental health outcomes among middle-aged and older spousal caregivers. *Health Psychology*, 17, 152–162. [PubMed: 9548706]
- Wrosch C, Miller GE, Scheier MF, & de-Pontet SB (2007). Giving up on unattainable goals: Benefits for health? *Personality and Social Psychology Bulletin*, 33, 251–265. [PubMed: 17259585]

Table 1

Importance of activities and performance in the past month by functional status

	Activity is Very Important, %					Very Important but Not Done in Past Month, %				
	Study Sample	High Funct	Mod Funct	Low Funct	p-value	Study Sample	High Funct	Mod Funct	Low Funct	p-value
Activity, Regardless of type	85.26 (N = 4,624)	87.43 (n = 1,662)	84.80 (n = 1,973)	80.45 (n = 989)	0.0013	14.54 (N = 3,956)	10.14 (n = 1,460)	15.19 (n = 1,685)	25.93 (n = 811)	<0.0001
Specific Activities										
Visit with Friends or Family	66.32 (N = 4,624)	70.88 (n = 1,662)	65.19 (n = 1,973)	56.65 (n = 989)	<0.0001	4.20 (N = 2,994)	2.47 (n = 1,167)	4.63 (n = 1,266)	8.90 (n = 561)	<0.0001
Attend Religious Services	52.80 (N = 4,624)	49.90 (n = 1,662)	55.65 (n = 1,973)	53.60 (n = 989)	0.0095	9.73 (N = 2,641)	5.76 (n = 890)	9.75 (n = 1,173)	19.82 (n = 578)	<0.0001
Participate in Clubs/Classes	33.11 (N = 4,624)	39.59 (n = 1,662)	29.25 (n = 1,973)	25.03 (n = 989)	<0.0001	13.80 (N = 1,510)	11.57 (n = 666)	14.05 (n = 587)	22.75 (n = 257)	0.0025
Go Out For Enjoyment	49.85 (N = 4,624)	57.67 (n = 1,662)	46.13 (n = 1,973)	37.74 (n = 989)	<0.0001	4.52 (N = 2,197)	1.92 (n = 945)	5.25 (n = 876)	13.13 (n = 376)	<0.0001

Note. Full study sample was used to examine the importance of each of the four activities (first five columns). The discrepancy between importance and performance, was examined using only those who endorsed the activity as being very important (last five columns).

Table 2

Transportation and Health limitations for activities not performed in the past month by functional status

	Transportation Limited Activity in Past Month, %				p-value	Health Limited Activity in Past Month, %				p-value
	Study Sample	High Funct	Mod Funct	Low Funct		Study Sample	High Funct	Mod Funct	Low Funct	
Activity, Regardless of type	6.93 (N = 662)	2.01 (n = 162)	3.93 (n = 272)	17.25 (n = 228)	<0.0001	24.76 (N = 662)	9.61 (n = 162)	17.79 (n = 272)	53.11 (n = 228)	<0.0001
Specific Activities										
Visit with Friends or Family	5.98 (N = 154)	0.00 (n = 35)	3.30 (n = 59)	15.66 (n = 60)	0.0052	14.73 (N = 154)	3.36 (n = 35)	6.29 (n = 59)	38.09 (n = 60)	<0.0001
Attend Religious Services	10.47 (N = 283)	4.00 (n = 55)	7.41 (n = 112)	19.16 (n = 116)	0.0056	30.56 (N = 283)	11.13 (n = 55)	21.55 (n = 112)	56.43 (n = 116)	<0.0001
Participate in Clubs/Classes	5.22 (N = 239)	3.04 (n = 80)	2.62 (n = 92)	14.70 (n = 67)	0.0042	20.84 (N = 239)	9.98 (n = 80)	19.32 (n = 92)	47.49 (n = 67)	0.0001
Go Out For Enjoyment	5.29 (N = 131)	1.47 (n = 24)	1.56 (n = 55)	12.17 (n = 52)	0.0155	34.16 (N = 131)	8.50 (n = 24)	22.49 (n = 55)	64.07 (n = 52)	<0.0001

Note. Transportation and health limitations were examined using only those who endorsed the activity as being very important and reported that they did not perform the activity in the past month. Sample sizes differ across activities.