

Original Research Article

Impairment Severity and Evaluative and Experienced Well-being Among Older Adults: Assessing the Role of Daily Activities

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Abstract

Background and Objectives: Physical impairments affect a substantial number of older adults in the United States, with rates increasing with advancing age. Impairment is linked with compromised well-being, although the reasons are not fully understood. We explore the extent to which linkages between impairment severity and well-being are accounted for by older adults' daily activities. We speculate that activities may influence global appraisals of well-being by offering the opportunity to fulfill productive and social roles and may influence daily emotions by shaping the context (places, people) in which life occurs.

Research Design and Method: We examine the effects of impairment severity on life satisfaction and four diary-based experienced well-being measures (happiness, frustration, worry, and sadness). Data are from the Disability and Use of Time supplement to the Panel Study of Income Dynamics ($n = 1,606$), a national sample of adults ages 60 years and older in the United States. We estimate nested regression models, taking into account within-person correlations for experienced well-being.

Results: Impairment severity is associated with poorer assessments of life satisfaction and all four dimensions of experienced well-being. Activity measures, which encompass eight productive (e.g., household chores) and three leisure (e.g., socializing) activities, account for 10% of the association between impairment and life satisfaction, and virtually none of the association between impairment and experienced well-being. However, psychosocial factors including higher neuroticism, lower self-efficacy, and poorer quality social relationships account for a sizeable share of the associations.

Discussion and Implications: Role-fulfilling aspects of activities appear to be more central than contextual aspects of activities to the impairment-well-being relationship. However, potentially modifiable psychosocial factors account for a much greater share of this relationship. Further research is needed on whether interventions targeting these psychosocial factors might bolster emotional well-being for older adults experiencing impairments.

Translational significance: Older adults may adapt to their physical limitations by withdrawing from activities and in doing so reduce their appraisals of their well-being. To maintain the well-being of older adults living with impairments, practitioners should attend not only to activities but to psychological and social needs that often accompany late-life impairment.

Keywords: Activities, Emotion, Functioning/mobility, Well-being

The aging of the U.S. population is unprecedented; by 2030, the number of Americans ages 65 years or older will exceed 70 million, accounting for 20% of the total population (U.S. Census Bureau, 2012). Roughly one in five older adults currently has a disability, defined as limitations in one's vision, hearing, mobility, communication, cognition, and/or capacity for self-care and growing proportions are living with underlying physical impairments that may eventually lead to activity limitations (The Federal Interagency Forum on Aging-Related Statistics, 2016; Martin & Schoeni, 2014). Researchers concur that the number of older adults living with such limitations will continue to increase as members of the large Baby Boom cohorts continue to reach retirement age over the next 15 years (Institute of Medicine, 2007).

The gerontological literature has consistently linked limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs) to poorer subjective well-being (George, 2010). This emphasis on ADLs and IADLs has overshadowed recognition of the centrality to quality of life in earlier stages of the disablement process, such as the development of underlying impairments in functioning (Freedman et al., 2017). Likewise, research to date has focused on a limited set of quality of life measures, typically focusing on global appraisals of well-being, such as overall life satisfaction. However, much less is known about the ways that impairments might influence a broad range of emotional experiences—for instance, happiness, sadness, frustration, or worry—as they occur while performing daily activities. Moreover, the focus on ADLs and IADLs has obscured investigation into the reasons why impairments may reduce subjective well-being in later life. We speculate that activities may influence global appraisals by offering the opportunity to fulfill productive and social roles and may influence daily emotions by shaping the context (places, people) in which life occurs.

Using a representative sample of older adults from the Panel Study of Income Dynamics (PSID), we examined the relationship between impairment severity and both evaluative and experienced well-being in a national sample of older adults. We focused on the role of daily activities, encompassing eight productive (e.g., paid work, housework, volunteering) and three leisure (e.g., socializing, exercise) activities. We further explored the extent to which associations persist net of potential confounding factors including psychological, social, economic, and demographic characteristics.

Background

Our analysis builds on broad conceptual models of disablement that have linked disablement to quality of life (right hand side of Figure 1). Disablement entails a process whereby health conditions lead to impairments in body functions and structures, which in turn influence the nature and extent of participation—that is, the

activities that constitute daily life (Verbrugge & Jette, 1994). Theoretical writings have asserted that disability undermines well-being, in part, because it necessitates a “fundamental reorientation to daily functioning and renegotiation of participation in the social world” (Bierman & Statland, 2010:631). Longitudinal studies demonstrate that these effects operate from disability to well-being, rather than vice-versa (Gayman et al., 2008; Ormel et al., 2002).

Distinctive Conceptualizations of Subjective Well-being

Our analysis links impairments to two conceptually distinct aspects of well-being: evaluative and experienced (National Research Council, 2013). Evaluative aspects of well-being, such as life satisfaction, typically require a cognitive appraisal of one's current situation relative to some standard, such as one's current goals (George, 1979), the accomplishments and activities of other members of one's reference group (Michalos, 1985), or one's earlier expectations and aspirations (Campbell, Converse, & Rodgers 1976). Experienced well-being, by contrast, captures positive and negative emotions experienced while carrying out daily activities. The latter captures how one is feeling “in the moment” (National Research Council, 2013). The two concepts are related, yet life satisfaction is considered more responsive to enduring aspects of quality of life, whereas daily mood is more responsive to contemporaneous and immediate circumstances (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004).

The Role of Activities

Gerontological research typically focuses on two broad sets of activities that may enrich (or reduce) well-being: productive and leisure activities. Productive activities encompass both market-based economic activities such as paid work, and nonmarket activities with economic value, such as housework, meal preparation, caregiving, or

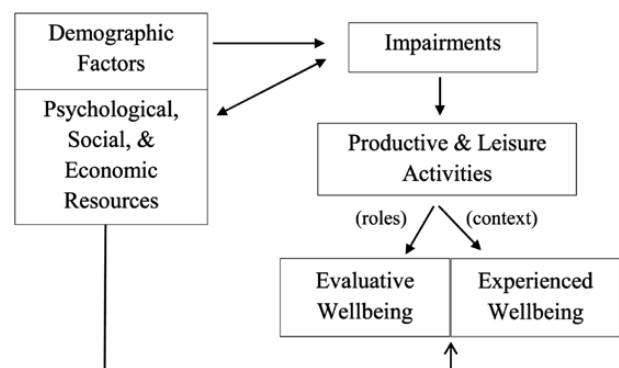


Figure 1. Associations among impairments, activities, and well-being in later life.

volunteering (Sherraden, Morrow-Howell, & Hinterlong, 2001). In general, research has found that paid employment, volunteering, and caregiving provide psychological benefits in terms of evaluative well-being. Yet these benefits appear to be contingent on factors including the number of hours engaged and the perceived stressfulness of the activity (Luoh & Herzog, 2002; Morrow-Howell, Hinterlong, Rozario, & Tang, 2003; Pinguart & Sørensen, 2003). By contrast, household activities such as meal preparation and doing laundry are less satisfying than other productive activities (Freedman, Cornman, & Carr, 2014). Leisure activities include preferred and enjoyable activities that one engages in during free time. These activities, such as going out with friends, may provide intrinsic satisfaction and social integration (Sayer, Freedman, & Bianchi, 2016). Empirical studies concur that leisure activities enhance well-being, even after controlling for health-related selection factors, with the largest benefits derived from social activities (Adams, Leibbrandt, & Moon, 2011).

We propose that the kinds of activities in which one participates (or avoids) may play an important role in linking impairments to both evaluative and experienced well-being. We expect impairments to impede both productive and leisure activities, which in turn is likely to reduce both evaluative and experienced well-being. However, the way in which activities may influence the two types of well-being may differ. Activities may influence life satisfaction by facilitating continuation of valued productive roles (employee, volunteer, caregiver) and social role-based relationships (spouse/partner, friend) in later life. Activities may influence experienced well-being more directly by establishing the context in which daily life occurs. For instance, working, caring, and socializing may convey emotional benefit related not only to what is being done, but also with whom (e.g., alone vs with others) and where (e.g., home vs in the community). A recent study suggests that role-based influences may be larger than contextual effects (Freedman, Stafford, Schwarz, Conrad, & Cornman, 2012); however, that study's conclusions were limited because it included only married individuals, considered a limited number activities, and did not consider other contextual facets of activities.

Other Influences on Impairment and Well-being

The association between impairment severity and well-being also may be accounted for by other potentially confounding influences, including differences in psychological, social, and economic resources and in demographic factors that are linked to both the development of impairments and to well-being (see left hand side of Figure 1). Note that the relationship between psychological, social, and economic resources and disability may unfold over time and in some

cases these effects may be bidirectional (designated with the double-arrow head in Figure 1).

Psychological factors are likely to be an important link between disablement and well-being. For instance, personality traits such as neuroticism and low levels of conscientiousness elevate older adults' risk for health problems and related disability and are associated with poorer appraisals of well-being (Goodwin & Friedman, 2006; Steel, Schmidt, & Shultz, 2008; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002). Personality traits are thought to affect well-being by influencing emotional reactivity and by facilitating adaptation following challenging life events, such as the onset of impairments (Lucas & Diener, 2015). Older individuals with high levels of self-efficacy are less likely to perceive limitations in daily activities and also report higher levels of subjective well-being (George, 2010; Seeman, Unger, McAvay, & Mendes de Leon, 1999). Religiosity, which encompasses both religious beliefs and participation, is generally associated with better physical health and subjective well-being (Diener, Tay, & Myers, 2011; Hybels, Blazer, George, & Koenig, 2012), and may be especially salient at greater levels of impairment (Kirby, Coleman, & Daley, 2004).

Social aspects of marital and family relationships also are likely to influence the statistical association between impairments and well-being, given a vast literature showing that family relationships protect against illness and physical health declines and also enhance emotional well-being (Carr & Springer, 2010). The quality of one's family relationships may be particularly important, since the onset of physical limitations may strain one's familial and marital relationships (Robles, Slatcher, Trombello, & McGinn, 2014), which may reduce subjective well-being (Carr, Freedman, Cornman, & Schwarz, 2014; Proulx et al., 2007).

Researchers have consistently documented socioeconomic gradients, in both physical functioning and emotional well-being. Economic resources, such as income or assets, may be a pathway as well as precursor linking disablement and well-being. Older adults with more severe impairment have fewer economic resources with which to accommodate their limitations, which in turn may negatively influence subjective well-being (e.g., Schoeni, Martin, Andreski, & Freedman, 2005).

Finally, demographic characteristics such as sex, race, and age, are well-established precursors of both disablement and well-being (Choi & Marks, 2006; Freedman et al., 2012).

In this paper, we assess the strength of the association between impairment severity and evaluative and experienced subjective well-being. We then evaluate the extent to which productive and leisure activities account for an observed association, before and after controlling for other potential confounders, including psychological, social, and economic resources. Finally, we quantify the extent to

which these additional psychological, social and economic factors account for the impairment-well-being relationship.

Methods

Data

Data are from the 2013 Disability and Use of Time (DUST) supplement to the 2013 Panel Study of Income Dynamics (PSID). The PSID began in 1968 with a sample of approximately 5,000 families, and is the longest running longitudinal study of a representative sample of families in the United States. The sample expands over time, as adult children who form their own independent households become eligible sample members. Interviews have been conducted annually through 1997 and biennially thereafter. Through 2013, reinterview rates were consistently 95% or above and the sample of families exceeded 9,000 in that year. With sampling weights, the design produces a nationally representative cross-section of families each year (McGonagle, Schoeni, Sastry, & Freedman, 2012).

The DUST supplement was administered to 2013 PSID household heads who were ages 60 years or older at the end of 2012 (born 1952 or earlier). In couple-headed households, both individuals were eligible if either spouse/partner was aged 60 years or older. Each respondent and, if married or cohabiting, his or her spouse/partner, was interviewed twice by telephone about one randomly selected weekday and one randomly selected weekend day. For couples, spouses/partners were interviewed (separately) about the same randomly selected day. The response rate was 71.7% (1,217 households completed at least one interview out of 1,698 eligible households).

The DUST instrument included a 30–40-min diary and, during the first of two interviews, a 15–20-min supplemental questionnaire (including items on life satisfaction, functioning, personality, marital/romantic partner and family relationship quality, and stylized time use questions). Respondents were systematically assigned interview days that would yield one weekday and one weekend diary, resulting in up to two diaries per respondent and four diaries per couple. The diary obtained information on all activities occurring on the previous day, beginning at 4 a.m. and continuing until 4 a.m. the morning of the interview. Respondents also reported how they felt while doing up to three activities randomly selected from their diaries, an approach modeled after the Day Reconstruction Method (Kahneman et al., 2004).

Overall, 1,776 respondents completed 3,505 diaries that included experienced well-being reports for 9,955 randomly selected activities. We excluded 167 spouses and partners under age 60 so that the sample represents individuals ages 60 years and older. We also excluded three respondents whose diaries did not contain experienced well-being reports. The final analytic sample comprised 1,606 respondents who provided experienced well-being reports for 9,020 randomly selected activities.

Measures

Dependent variables

Our focal outcomes are one indicator of evaluative (life satisfaction) and four measures of experiential (happiness, frustration, worry, sadness) well-being. *Life satisfaction* is measured with a single item asking respondents to indicate how satisfied they were with their “life as a whole” on a scale from 0 (not at all) to 6 (very). *Experienced well-being* assessments were obtained in the diary portion of the interviews. For each of three randomly selected diary activities, respondents reported on a scale from 0 (not at all) to 6 (very strong) how intensely they felt various emotions during the activity. We focus on happy, frustrated, worried, and sad, which are among the discrete emotions experienced most frequently by older adults (Chipperfield, Perry, & Weiner, 2003). Missing values for the dependent variables were rare (<0.5%) and set to modal values.

Key independent variables

Our focal predictor variable is *severity of impairment*. We constructed this measure from questions asking whether respondents experienced common impairments in the last seven days, and if so, on how many days each such impairment limited their activities (none, one to two, three to four, or five or more days). Specific impairments included: breathing problems; heart or circulation problems; stomach problems; back or neck problems; limited strength or movement in one’s shoulders, arms, or hands; limited strength or movement in one’s hips, legs, knees, or feet; low energy or easily exhausted; and difficulty remembering everyday things. These items formed a one-factor severity scale (ranging from 0 to 32) and Cronbach’s α suggested acceptable levels of internal consistency ($\alpha = 0.72$). We assumed that the handful of cases with missing values on an impairment item (0.12%) did not have that particular impairment. To evaluate possible nonlinear associations between severity and well-being, we also created quartiles with corresponding values of 0 (lowest quartile; 27%), 1 to 2 (24%), 3 to 7 (27%), and 8 to 32 (highest impairment quartile; 23%).

Our main aim is to assess whether associations between impairment severity and well-being are accounted for by the *daily activities* in which one participates. Because life satisfaction reports are a global appraisal and are not assessments of a particular day, in our multivariate models predicting life satisfaction we use a measure of activities that occurred during the prior week. For experienced well-being models, we focus on randomly selected activities for which emotions were assessed. For both activities last week and randomly selected activities, we constructed indicators of whether the activity fell into one of eight common *productive activities* (work for pay; volunteer; care for others; do laundry, do household chores; prepare food; financial management tasks; and shopping/errands) or one of three common *leisure activities* (socialize; exercise; go out for pleasure). In the multivariate analyses, the omitted category

comprises all other types of activities, mainly nonactive leisure activities such as watching television. In experienced well-being models, we also control for three *contextual aspects* of the activity reports: with whom the activity was done (spouse, others, or alone); where the activity took place (at home vs elsewhere); and whether the respondent considered the diary day to be a typical day or not.

Additional variables

We also included in models psychological, social, and economic resources and demographic factors. Missing data rates were quite low (generally <1%) so we applied modal values in order to maximize sample size.

Personality was measured using an adapted version of the Big 5 personality taxonomy, as administered in the German Socioeconomic Panel Study (Gerlitz & Schupp, 2005). We focus on the three traits that elsewhere have evidenced the strongest relationship to disability—extraversion, neuroticism, and conscientiousness (e.g., Goodwin & Friedman, 2006). We created scales by averaging items, with higher scores indicating a greater degree of the trait (alphas ranged from 0.54 to 0.66). *Religiosity* ($\alpha = 0.88$) was measured by averaging four items that reflected how much respondents agreed with statements regarding the strength and influence of their religious beliefs, such as “How much do your religious beliefs affect your daily life?” (Fetzer Institute/National Institute on Aging Working Group, 2003). *Self-efficacy* ($\alpha = 0.53$) is assessed by presenting respondents with five pairs of statements and asking them to indicate which one better described them. For example, “Are you the kind of person that plans your life ahead all the time, or do you live more from day to day?” One point was given for choosing the statement reflecting greater self-efficacy (Converse, Dotson, Hoag, & McGee, 1980).

We also included several measures of social and interpersonal resources: marital status (not married, married, has romantic partner); marital/romantic relationship quality, and family relationship quality. *Marital quality* ($\alpha = 0.80$) and *family relationship quality* ($\alpha = 0.47$) each are measured with a subset of four items drawn from a standardized instrument reflecting both strain and support (Walen & Lachman, 2000), such as how much one’s spouse/family members appreciated them (support) or argued with them (strain). Higher values reflected more positive assessments. Persons without a partner were assigned a value of 0 on the marital quality scale.

Economic resources were measured with 2012 family income (in quartiles) and 2013 family wealth (in quartiles), as reported in the 2013 PSID family interview. Family income includes taxable income and cash transfers received by adult family members. Family wealth includes nine broad asset and liability categories including home equity (PSID, 2015). The two measures were moderately correlated ($r = .54$). We also explored whether controlling for educational attainment in place of income and wealth altered our substantive conclusions and found that it did not.

Three additional *demographic characteristics* are controlled in all models: age (in 10-year age groups), sex, and race (Black vs non-Black).

Analytic Approach

We first conducted bivariate analyses by impairment severity quartiles, evaluating differences with respect to: evaluative and experienced well-being and activities last week and yesterday. In Supplementary Tables, we examined the relationship between severity impairment and activity context (with whom, where, and whether typical day) and other potentially confounding psychological, social and economic resources, and demographic characteristics (see Supplementary Tables 1 and 2). We also examined means in evaluative and experienced well-being by activities. We conducted *t* tests to evaluate significant differences for continuous measures, and chi-square tests to evaluate differences in categorical measures. We also calculated zero-order correlations between a continuous measure of impairment severity and well-being.

We then conducted multivariate analyses using ordinary least square (OLS) regression for life satisfaction and multi-level linear regression for the experienced well-being measures. The latter models account for clustering of random activities within individuals. In preliminary analyses, we included impairment quartiles and found results and fit statistics were similar to models with a continuous measure of impairment severity, so we include only the more parsimonious models with the single continuous measure here. We tested final model specifications for multicollinearity and found it was not an issue and that results were robust to the exclusion of influential cases. We also considered other model specifications (e.g., ordinal, count), which we found were robust for life satisfaction outcomes; but we were unable to properly incorporate clustering in these alternative specifications for the experienced well-being models. To facilitate cross-model comparisons, we therefore opted for linear models for both outcomes. All analyses were run in Stata 14.0 (StataCorp, 2015) with sampling weights that take into account the PSID and DUST sample designs and nonresponse (Freedman & Cornman, 2015).

The baseline model (Model 1) included only impairment severity (continuous) and demographic characteristics that have strong and well-documented associations with well-being (age, sex, race). Model 2 added activity characteristics only. Model 3 added to the baseline model psychological, social, and economic resources. The final model (Model 4; full model shown in Supplementary Table 3) controlled for all variables. We focus on the percentage change in the impairment severity coefficient (compared to the baseline model and between Models 3 and 4). Finally, in supplemental analyses (Models 3a-3c in Supplementary Table 4), we entered each block of psychological, social, and economic variables separately to the base model to evaluate each

block's contribution to the association between impairment and well-being. We also added variables individually (not shown) to explore which particular factors accounted for the largest share of the impairment coefficient.

Results

Bivariate Analysis

Impairment severity and well-being

Older adults with more severe impairment experience significantly worse evaluative and experienced well-being (Table 1). Across the four impairment severity quartiles, increasing severity is monotonically and significantly associated with lower life satisfaction, less happiness, and higher levels of frustration, worry, and sadness. Zero-order correlations between a continuous measure of impairment severity and each well-being item shows a stronger association for life satisfaction ($r = -.29$) versus the four experienced well-being measures ($r = -.14$ for happy; $r = .14-.19$ for negative emotion outcomes), consistent with our hypothesis that the enduring nature of disablement would be particularly consequential for evaluative rather than experienced well-being.

Activity profiles, impairment severity, and well-being

Activities over the past week differ significantly by impairment severity level for 9 of the 11 activities, with the two exceptions of food preparation and financial management (left side, Table 2). The strongest gradient emerges for the past week activity of working for pay; those in the lowest impairment quartile were more than twice as likely as those in the highest quartile (38.2% vs 14.7%) to have worked for pay in the past week. The magnitude of the gap is narrower, yet follows a similar gradient for other productive activities like volunteering, caring for others, laundry, household chores, and errands, and leisure activities such as socializing, exercising and going out for pleasure.

A considerably smaller proportion of older adults participated in any given activity yesterday, relative to the past week (right side, Table 2). Although activities randomly chosen yesterday also vary by impairment level, the

differentials are less steep and do not rise to statistical significance at the $p < .05$ level with the exception of going out for pleasure. Surprisingly, this activity is *least* common among those in the lowest impairment quartile (1.7%) versus the three higher impairment quartile (percentages range from 2.4 to 3.5). This pattern may reflect the higher rates of paid work among those in the lowest impairment category, which may reduce the time one has available for leisure. Two productive activities differ at the $p < .10$ level, working for pay and preparing foods, which are less frequent at higher impairment levels. Whether activities are carried out alone, with a spouse, or with others does not vary by impairment level, but older adults in the highest impairment quartile are more likely than others to have carried out their activities at home (Supplementary Table 1).

We also investigated the link between activities and well-being (see Table 3). We find that volunteering is linked to the highest levels of life satisfaction whereas exercise elicits the highest levels of happiness. Financial management tasks are by far the activity most strongly linked with negative emotions, especially frustration. Spending time with one's spouse or partner is associated with more happiness than being with others or alone and less worry than being with others ($p \leq .01$), but differences by location are small and do not reach statistical significance at conventional levels. Finally, typical days are associated with more happiness ($p < .01$) and less worry ($p = .04$) than atypical days.

Multivariate Analysis

The baseline model (Model 1) in Table 4 shows that the continuous measure of impairment severity is significantly associated with all five outcomes. Net of demographic characteristics, impairment severity is inversely related to both life satisfaction ($b = -.062$, $p < .01$) and happiness ($b = -.043$, $p < 0.01$) and positively related to frustration ($b = .051$, $p < .01$), worry ($b = .049$, $p < .01$), and sadness ($b = .043$, $p < .01$).

Our second aim is to evaluate the extent to which these associations are accounted for by differences in the activities of more versus less severely impaired older adults. The first column for Model 2 reveals that controlling for

Table 1. Evaluative and Experienced Well-being by Severity of Impairments Among Older Persons (Ages 60+)

	Life satisfaction	Happy	Frustrated	Worried	Sad
All Respondents, Mean (SD)	4.99 (1.05)	4.97 (1.19)	0.83 (1.52)	0.56 (1.27)	0.42 (1.16)
By Severity impairments, Mean ^a					
1 st quartile (0)	5.31	5.20	0.57	0.31	0.23
2 nd quartile (1–2)	5.12 (<0.01)	5.01 (<0.01)	0.73 (0.01)	0.48 (<0.01)	0.36 (0.02)
3 rd quartile (3–7)	4.96 (<0.01)	4.92 (<0.01)	0.92 (<0.01)	0.62 (<0.01)	0.45 (<0.01)
4 th quartile (8–32)	4.45 (<0.01)	4.66 (<0.01)	1.20 (<0.01)	0.94 (<0.01)	0.75 (<0.01)
Correlation with well-being ^b	–0.29 (<0.01)	–0.14 (<0.01)	0.14 (<0.01)	0.18 (<0.01)	0.19 (<0.01)
N	1,606	9,020	9,020	9,020	9,020

Note: All outcomes range from 0 to 6.

^a p value (in parentheses) for t tests for difference from 1st quartile. ^b p value (in parentheses) for difference from 0.

Table 2. Percentage Engaged in Each Activity, by Severity of Impairments Quartile

	All	Q1	Q2	Q3	Q4	<i>p</i> value ^a	All	Q1	Q2	Q3	Q4	<i>p</i> value ^a
	Last 7 days						Random activity yesterday					
Productive activities												
Work for pay	27.7	38.2	29.2	25.9	14.7	<.001	8.0	9.7	7.6	8.4	5.3	.091
Volunteer	21.5	22.3	25.5	24.2	12.3	.004	0.6	0.5	0.3	0.6	0.9	.548
Care for others	27.9	26.7	35.0	25.2	24.9	.006	2.5	2.6	2.8	2.4	2.0	.799
Laundry	70.1	67.8	75.8	71.4	65.1	.030	1.4	0.9	1.4	1.7	1.9	.373
Household chores	85.5	88.9	87.1	87.6	76.3	<.001	7.5	7.8	7.7	6.8	7.7	.806
Prepare food	78.7	76.9	78.5	82.3	76.3	.218	8.3	8.9	9.9	7.0	7.3	.090
Financial management	68.0	67.4	72.1	68.7	63.5	.098	2.1	2.6	1.6	2.3	2.0	.431
Shopping/errands	82.0	84.1	86.0	83.6	72.6	<.001	8.9	8.7	7.6	9.7	8.9	.406
Leisure activities												
Socialize	84.8	89.7	87.0	85.8	74.7	<.001	5.7	5.4	6.7	4.5	6.5	.113
Exercise	65.4	73.4	69.7	66.4	49.0	<.001	2.6	3.3	2.5	2.3	2.0	.308
Go out for pleasure	68.2	74.1	73.7	70.6	51.2	<.001	2.7	1.7	3.1	3.5	2.4	.011

n = 1,606 respondents and 9,020 activities; ^a*p* values for *chi-square* tests.

Table 3. Mean (SD) Evaluative and Experienced Well-being by Activities Among Older Persons (Ages 60+)

	Life satisfaction	Happy	Frustrated	Worried	Sad
Productive activities					
Work for pay	4.99 (0.94)	4.61 (1.17)	1.12 (1.62)	0.64 (1.29)	0.30 (0.94)
Volunteer	5.17 (0.89)	4.92 (0.87)	0.70 (1.24)	0.49 (0.89)	0.62 (1.24)
Care for others	5.01 (1.06)	5.15 (1.15)	0.91 (1.35)	0.63 (1.16)	0.41 (1.08)
Laundry	4.97 (1.02)	4.44 (1.23)	0.79 (1.42)	0.38 (1.07)	0.29 (0.87)
Household chores	5.02 (1.00)	4.80 (1.40)	0.94 (1.60)	0.42 (1.16)	0.39 (1.19)
Prepare food	4.98 (1.00)	5.05 (0.92)	0.62 (1.15)	0.39 (0.94)	0.36 (0.92)
Financial management	4.96 (1.00)	4.59 (1.20)	1.18 (1.45)	0.75 (1.22)	0.57 (1.09)
Shopping/errands	5.00 (1.00)	5.01 (0.91)	0.91 (1.42)	0.51 (1.06)	0.31 (0.86)
Leisure activities					
Socialize	5.03 (0.97)	5.14 (1.24)	0.57 (1.32)	0.80 (1.65)	0.64 (1.58)
Exercise	5.08 (0.98)	5.20 (1.10)	0.69 (1.39)	0.42 (1.03)	0.17 (0.74)
Go out for pleasure	5.11 (0.89)	5.15 (1.37)	0.78 (1.52)	0.57 (1.45)	0.40 (1.17)
Activity context					
With spouse/partner	-	5.15 (1.14)	0.74 (1.49)	0.51 (1.24)	0.37 (1.08)
With others	-	4.99 (1.28)	0.84 (1.56)	0.67 (1.44)	0.46 (1.25)
Alone	-	4.88 (1.16)	0.86 (1.52)	0.51 (1.17)	0.42 (1.14)
At home	-	4.96 (1.23)	0.80 (1.56)	0.55 (1.30)	0.45 (1.23)
Other places	-	4.99 (1.15)	0.86 (1.47)	0.58 (1.23)	0.38 (1.07)
Typical day	-	5.04 (1.18)	0.80 (1.53)	0.52 (1.26)	0.41 (1.16)
Not typical day	-	4.84 (1.20)	0.88 (1.50)	0.63 (1.27)	0.46 (1.15)

Note: All outcomes range from 0 to 6; *n* = 1,606 respondents and 9,020 activities.

activity characteristics reduces the coefficient on impairment severity from $b = -.062$ to $-.056$ for life satisfaction, nearly a 10% reduction, although the effect remains statistically significant. Additional analyses (not shown) reveal that this attenuation is accounted for by just two activities: volunteering and going out for pleasure. We also find negligible or no attenuation in the association between impairment and experienced well-being. The effect of impairment on sadness declines by just 2.3%, from $b = .043$ to $.042$, net of daily activities, and we observe a very slight suppression of the effect of impairment on happiness (from $b = -.043$ to

$b = -.044$, or a 2.3% increase). Controlling for daily activities does not alter the association between impairment and either frustration or worry.

Adding activities to a model controlling for psychological, social, and economic resources (Models 4 vs 3; see last row of Table 4) reinforces these general findings. That is, activities account for a modest share of the impairment-life satisfaction relationship (5.6%) and a more negligible amount of the impairment-experienced well-being relationship (-3.6% for sadness to 3.0% for frustrated). The full model (Model 4 in Table 4; and Supplementary Table

Table 4. Effect of Impairment Severity on Evaluative and Experienced Well-being Among Older Adults (Ages 60+) and Percentage Change in Impairment Effect Accounted for by Activities, Psychological, Social, and Economic Factors

Model	Life satisfaction		Happy		Frustrated		Worried		Sad	
	Coefficient ^a	Change ^b	Coefficient ^c	Change ^b	Coefficient ^c	Change ^b	Coefficient ^c	Change ^b	Coefficient ^c	Change ^b
(1) Base	-0.062*	--	-0.043*	--	0.051*	--	0.049*	--	0.043*	--
	(0.006)		(0.005)		(0.006)		(0.008)		(0.002)	
(2) Base + Activities	-0.056*	-9.7	-0.044*	2.3	0.051*	0.0	0.049*	0.0	0.042*	-2.3
	(0.006)		(0.005)		(0.006)		(0.008)		(0.002)	
(3) Base + Psychological, Social, Economic Factors	-0.036*	-41.9	-0.031*	-27.9	0.033*	-35.3	0.029*	-40.8	0.028*	-34.9
	(0.007)		(0.006)		(0.003)		(0.007)		(0.002)	
(4) Base + Psychological, Social, Economic Factors + Activities	-0.034*	-45.2	-0.031*	-27.9	0.034*	-33.3	0.029*	-40.8	0.027*	-37.2
	(0.006)		(0.005)		(0.003)		(0.007)		(0.002)	
N	--	-5.6	--	0.0	--	3.0	--	-0.0	--	-3.6
	1,606		9,020		9,020		9,020		9,020	

Note: ^aContinuous impairment severity coefficient from ordinary least squares regression model. Standard errors in parentheses. ^bAll rows except final row show percentage change from base model in impairment severity. Final row shows percentage change from Model 3. Negative values indicate coefficient was reduced (toward null); positive values indicate coefficient increased (away from null). ^cContinuous impairment severity coefficient from multi-level regression models. Standard errors in parentheses.

*Significant at $p < .01$.

3) reveals persistent and significant effects of impairment severity (ranging from $b = -.034, p < .01$ for life satisfaction to $b = .034, p < .01$ for frustrated), however activity effects differ for evaluative and experienced well-being. None of the activities last week are statistically significant predictors of evaluative well-being; however, activity type and context appear to be important in shaping experienced well-being. For instance, relative to omitted nonactive leisure activities, productive activities (such as work, laundry, household chores/repairs, and financial management) are associated with lower happiness whereas socializing is associated with higher happiness. In addition interacting with others during activities (vs being alone) and having a typical day (vs not) are associated with higher happiness.

Finally, among the psychological, social, and economic resources that we consider, we find that psychological factors account for 30–39% of the association between impairment severity and each of the well-being outcomes (see Supplementary Table 4). Neuroticism and self-efficacy each account for roughly half of this effect (not shown). Social factors account for 23% of the effect of impairment on life satisfaction and 14–18% of its effects on the experienced well-being measures. Family relationship quality and marital/partner relationship quality account for roughly equal shares of the association (not shown). Economic factors account for a modest share of the association between impairment and life satisfaction (9.7%), but play virtually no role in the association between impairment and the experienced well-being measures.

Discussion

This study explored associations between impairment severity and evaluative and experienced well-being in a national sample of older adults and the extent to which these patterns reflect differences in activities. We found

that impairment severity is significantly linked with all five aspects of well-being, yet daily activities play only a modest role in explaining the association between impairment and life satisfaction and virtually no role in understanding the linkage between impairment and experienced well-being. In contrast, psychological factors associated with coping, especially low levels of neuroticism and high levels of perceived efficacy, accounted for 30–40% of this variation.

Our findings have several implications for both refining theories of healthy aging and for enhancing the well-being of older adults in the face of impairment. First, we found that older adults' self-reported productive and leisure activities were linked to impairment severity, and these patterns were stronger for activities reported over the last week than for randomly selected activities. We found strong gradients in nearly every activity performed over the past week, with the exception of two household tasks: food preparation and financial management. We found the largest disparity for paid work, which is arguably the most highly structured and time-consuming of the activities considered, yet we also found steep gradients in leisure activities, including going out for pleasure and socializing. These descriptive results suggest that older adults may adapt to their physical limitations by withdrawing from activities that overtax their capacities. These results challenge the tenets of disengagement theory, a classic gerontological theory that characterized withdrawal as a universal facet of aging. Our results suggest, to the contrary, that older adults living with impairments may selectively withdraw only from activities that challenge their physical capacities (Cumming & Henry, 1961). However, we also found suggestive evidence that even those with impairment may not have the luxury of withdrawing from activities that are necessary for daily living; we found no differences across impairment severity quartiles with respect to meal preparation and financial management and inconsistent patterns for laundry.

Second, activities played only a modest role in the impairment-life satisfaction linkage and virtually no role in the impairment-well-being linkage. Roughly 10% of the negative effect of impairment on life satisfaction was accounted for by activities, with just two activities playing an explanatory role: volunteering and going out for pleasure. Such findings are consistent with contemporary empirical work on positive benefits of continued social and productive engagement in later life (Johnson & Mutchler, 2014). However, reasons for the limited explanatory power of activities in delineating the impairment-evaluative well-being relationship are unclear. Prior studies of the psychological consequences of productive activity underscore that effects are conditional on the intensity, desirability, and perceived stressfulness of activities such as work or volunteering (Luoh & Herzog, 2002; Morrow-Howell et al., 2003; Pinquart & Sörensen, 2003). Attention to these sources of heterogeneity may be a fruitful next step. We also found that activity context—not only the nature of the activity but spending time engaged with others—was important in shaping experienced well-being; yet, activities did not account for virtually any of the impairment-experienced well-being relationship. Taken together, these findings reinforce that the role-fulfilling aspects of activities may be more central than the contextual aspects of activities to the impairment-well-being relationship.

Third, psychological and, to a lesser degree, social factors explained a considerable share of the association between impairment severity and well-being. Higher neuroticism and lower self-efficacy are especially important confounders. The role of self-efficacy has been studied extensively in the aging and health/disability literature (Seeman et al., 1999; Strough, Bruine de Bruin, & Peters, 2015), yet personality traits have received less attention. Our findings suggest that older adults who report higher levels of neuroticism may be at elevated risk for both experiencing and perceiving severe impairments, which in turn have a detrimental effect on well-being. With the DUST data we could not identify why this is the case; however, other studies have linked neuroticism to maladaptive coping that might inhibit one's ability to stave off the harmful effects of functional decline (McCrae & Costa, 1986). Our findings suggest that clinicians and practitioners should consider older adults' personality and coping skills, in addition to psychological disorders such as major depression, when developing treatment plans or interventions.

Finally, poorer spouse/partner and family relationships account for a sizeable share of the impairment-well-being association. We could not definitively ascertain the direction of effect between impairments and relationship quality, yet other research has shown that perceived support from family mediates the association between disability and well-being (Newsom & Schulz, 1996). Consequently, finding ways to either strengthen family relationships or

to provide other sources of emotional and instrumental support for older adults at risk of developing limiting impairments also may prove a useful avenue for improving late-life well-being.

Limitations

Our study is the first we know of to evaluate the role of daily activities as a potential pathway linking impairment and two distinctive aspects of psychological well-being. However, our analysis is limited in several important ways. First, we cannot pinpoint the causal direction of the confounding relationships, particularly among psychosocial and economic resources and impairment severity. Second, our analysis is limited to adults ages 60 years and older. We therefore cannot speak to how these relationships differ from those in midlife when impairments may first emerge. Studying the link between impairments and well-being in those aging with an early-onset disability would be a useful extension. We also did not explore differences in these relationships by demographic characteristics like age and sex, or moderating effects of coping resources that might buffer detrimental effects of impairment severity on subjective well-being. Such investigations are an important next step.

Despite these limitations, our findings highlight the strong relationship between impairment severity and reduced well-being in later life, both in terms of evaluations of life and daily experiences. Our findings reinforce that these measures capture different aspects of well-being and as such are both useful in assessing the detrimental effects of impairment. Findings also point to potentially modifiable factors that account for these associations. These results suggest that practitioners and researchers alike should attend to the socioemotional needs that accompany impairment. Although we found that activities played only a minor role in explaining the link between disablement and well-being, those activities that were particularly rewarding for well-being should be promoted and supported by professionals who work with older adults—with volunteering and exercise providing the largest boosts to well-being. At the same time, further research is needed into ways to stave off both disability and to combat its negative effects on both evaluative and experienced well-being in later life.

Supplementary Material

Supplementary data is available at *Innovation in Aging* online.

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Conflict of Interest

None reported.

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