Relationship of Activity and Social Support to the Functional Health of Older Adults

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Objectives. According to J. W. Rowe and R. L. Kahn (1997), successful aging is the combination of low probability of disease, high functioning, and active engagement with life. The purpose of this study was to assess the relationship between active engagement with life and functioning in a convenience sample of community-dwelling adults aged 65 and older.

Methods. In this cross-sectional study, 244 members of an organization for older adults were mailed a survey containing the Activity Checklist and the Social Support Inventory as measures of engagement with life and the SF-12 Health Survey as a measure of functioning.

Results. Hierarchical linear regression showed that maintenance of instrumental, social, and high-demand leisure activities was associated with higher physical health scores and maintenance of low-demand leisure activities was associated with lower physical health scores. Maintenance of low-demand leisure activities was associated with higher mental health scores.

Discussion. If changes in potentially modifiable risk factors such as activity are associated with the beginning of functional decline, early intervention may be possible before disability ensues, thus reducing the risk of disability and ultimately health care costs.

Successful aging has been described as adaptation (Baltes & Baltes, 1990), morbidity compression (Fries, 1980), and high functional, affective, and cognitive status (Garfein & Herzog, 1995). Rowe and Kahn (1997) proposed a model of successful aging comprising three components: avoidance of disability, maintenance of physical functioning, and active engagement with life. Successful aging occurs at their intersection and is more than the absence of disease and maintenance of high functioning. Although all three in combination are crucial to living a long and healthy life, active engagement with life has received the least attention.

According to Rowe and Kahn (1997), engagement with life includes activity and social support. Activity has long been a focus of study for researchers interested in successful aging (e.g., Lemon, Bengtson, & Peterson, 1972; Longino & Kart, 1982), and generally activity has positive effects. Researchers have grouped activities into different and often overlapping categories. Engaging in social activities has been associated with increased well being among community-dwelling older adults (Everard, 1999) and among those with arthritis (Zimmer, Hickey, & Searle, 1995). Unger, Johnson, and Marks (1997) found that engagement in social activities was associated with increased physical function and predicted a slower decline in functional status over a 6-year period. Instrumental activities (sometimes called productive activities), such as housework or shopping, also have been associated with better health and function (Glass, Seeman, Herzog, Kahn, & Berkman, 1995; Horgas, Wilms, & Baltes, 1998).

Leisure activities that are physically demanding have been associated with better function for older adults (See-
increased disability (Weinberger, Tierney, Booher, & Hiner, 1990) and mortality among older adults (Penninx et al., 1997). Few researchers have included both activity and social support when examining the relationship between engagement with life and functioning in older adults, and to our knowledge no studies have included social, instrumental, and leisure activities together. The relationship of activity and social support to functioning can be important in development of early interventions to prevent disability or enhance successful aging. In this study we examined the relationship of engagement, as activity and social support, to functioning in older adults.

Methods

Participants

Participants were a sample of 244 members of OASIS, an organization for older adults. Although a convenience sample, participants were randomly selected to include older adults in health promotion courses, in non-health-related courses, and in no courses. The questionnaire and a stamped, self-addressed envelope were mailed with a cover letter explaining the purpose and that participation was voluntary. Returning the questionnaire indicated informed consent. Reminders were sent to those who had not returned the questionnaire. We mailed 1,007 questionnaires. Twenty-three questionnaires were undeliverable, leaving 984 as our denominator; 697 were returned for a response rate of 71%. A measure of perceived social support was added to the survey midway through data collection. Our analyses were conducted with the 244 participants who completed this and other measures.

Measures

We asked demographic questions about age, gender, marital status, education, race, and income. We used a 55-item Activity Checklist modified from the Activity Card Sort (Baum, 1993, 1995) to assess activity engagement. The card sort and the checklist consist of the same activities, and the only difference is in the administration. The checklist describes participants’ retention of their activities rather than time committed to activities; activity frequency; and whether activities are done alone, or whether an individual needs assistance with the activity. New activities are noted by participants’ indicating that they do the activity now. The Activity Checklist has four sub-scales: instrumental activities (e.g., shopping, cooking, paying bills, and doing housework), social activities (e.g., traveling, entertaining, attending parties, and attending church), high-demand leisure activities (e.g., swimming, woodwork- ing, walking, and gardening), and low-demand leisure activities (e.g., sewing, reading, watching television, and listening to music). For each activity, participants indicate whether they have never done the activity, have not done the activity within the last 5 years, do the activity now, do the activity less, or have given up the activity.

To calculate current activity, we calculated previous activity levels by totaling the number of activities that participants marked that they do now, do less, or have given up. Each activity they indicated that they do now, do less, or have given up was given a value of 1 and those they do less have given up were given a value of .5. We calculated the proportion of activities given up by dividing the activities given up by the previous activity levels. We calculated the current level of activity by subtracting the proportion of activities given up from 1. The scoring procedure was developed to recognize the individual’s personal choice of activities and to avoid a penalty for activities never done.

Reliability and validity testing for the Activity Checklist was conducted on a sample of 20 community-dwelling adults aged 65 to 87. We interviewed participants using the Activity Card Sort and mailed them the Activity Checklist after the interview. Participants were mailed another checklist about 30 days after the first checklist was returned. Concurrent validity of the checklist with the Activity Card Sort was .90, .78, .82, and .72 for instrumental, social, low-demand leisure, and high-demand leisure activity subscales, respectively. Test–retest reliability, with a time interval of 74 days, was .95, .83, .91, and .88 for the instrumental, social, low-demand leisure, and high-demand leisure activity subscales, respectively.

Social support.—We used the 17-item Social Support Inventory (SSI) to assess perceived social support because it assesses type (emotional or instrumental) and style (directive or nondirective) of support. Providers of directive support take over responsibility for tasks and are pointed in encouraging “correct” feelings and choices, such as looking on the bright side. Providers of nondirective support cooperate without taking over and accept recipients’ feelings and choices.

Participants were asked to indicate on a scale from 1 to 5 how accurately each question described the support they received. We calculated subscale scores by summing the items and dividing by the number of items. Higher scores reflect higher levels of perceived support. Cronbach’s alphas were .83, .69, .88, and .93 for directive instrumental, nondirective instrumental, directive emotional, and nondirective emotional support, respectively.

Functioning.—We used the SF-12 Health Survey (Ware, Kosinski, & Keller, 1995) to measure functioning. Its brief subscales, each with six items, assess the effects of physical and mental health on functioning. A performance measure of functioning was not possible in this mailed survey. The subscales were scored using norm-based methods that can be compared to the U.S. population. Scores were transformed into standardized T scores ($M = 50$, $SD = 10$) where higher scores indicate better functioning. Test–retest reliability with a 2-week time interval was .89 for the physical subscale and .76 for the mental subscale (McHorney, Kosinski, & Ware, 1994). Relative validity coefficients, measured with a known groups procedure, for the physical subscale ranged from .43 to .78 and for the mental subscale ranged from .93 to .98 in previous tests (Ware, Kosinski, & Keller, 1996).

Data Analysis

Descriptive statistics were calculated for study variables. To test the relationship between engagement and functioning, we used two hierarchical regression models with the SF-12 subscales as dependent variables. Older, female, and low-income adults often experience poor health. Because
The dependent variables (−.025) nor the path between the dependent variables from the simultaneous model (−.10) was significant. Thus, we chose to use two regression models.

### Results

**Participant Characteristics**

Participants were primarily White (97.5%) and female (75%). Mean age was 73 (SD = 5.3, range = 65–89), and 56.6% were married. Participants were well educated, with 45% being college graduates. Table 1 provides means, standard deviations, ranges, and percentages for all variables used in the regression models.

Both regression models testing the relationship of activity and social support to physical and mental health were significant. In the model with physical health as the dependent variable, 30.2% of the variance in physical health was accounted for by the independent variables (p < .0001). The control variables entered in the first step accounted for 4.7% of the variance, and social support and activity variables entered in the second step accounted for an additional 25.5% of the variance. In the full model, gender and the activity variables were significant. Being male was associated with higher physical health scores (β = .16, p = .013). Maintenance of instrumental (β = .19, p = .006), social (β = .30, p = .0001), and high-demand leisure (β = .30, p = .0001) activities was positively associated with physical health. Maintenance of low-demand leisure activities was negatively associated with physical health (β = −.19, p = .015).

In the regression model with mental health as the dependent variable, 18.1% of the variance was accounted for by the independent variables (p < .0001). The controls entered in the first step accounted for 3.4% of the variance. The social support and activity variables entered in the second step accounted for an additional 14.7% of the variance in mental health. Only maintenance of low-demand leisure activities (β = .31, p = .0001), however, was independently associated with increased mental health. The regression summaries for both models are displayed in Table 2.

### Table 1. Descriptive Statistics for Variables Included in the Regression Models (N = 244)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>73.24</td>
<td>5.29</td>
<td>65–89</td>
</tr>
<tr>
<td>Instrumental activities</td>
<td>.86</td>
<td>.12</td>
<td>.33–1.0</td>
</tr>
<tr>
<td>Social activities</td>
<td>.78</td>
<td>.17</td>
<td>.18–1.0</td>
</tr>
<tr>
<td>High-demand leisure activities</td>
<td>.58</td>
<td>.24</td>
<td>0–1.0</td>
</tr>
<tr>
<td>Low-demand leisure activities</td>
<td>.79</td>
<td>.15</td>
<td>.24–1.0</td>
</tr>
<tr>
<td>Nondirective emotional support</td>
<td>3.45</td>
<td>1.13</td>
<td>1–5</td>
</tr>
<tr>
<td>Nondirective instrumental support</td>
<td>2.65</td>
<td>.68</td>
<td>1–3.75</td>
</tr>
<tr>
<td>Directive emotional support</td>
<td>3.14</td>
<td>1.12</td>
<td>1–5</td>
</tr>
<tr>
<td>Directive instrumental support</td>
<td>2.07</td>
<td>.89</td>
<td>1–4.8</td>
</tr>
<tr>
<td>Physical health</td>
<td>44.59</td>
<td>10.88</td>
<td>16–64</td>
</tr>
<tr>
<td>Mental health</td>
<td>54.83</td>
<td>7.36</td>
<td>27–66</td>
</tr>
</tbody>
</table>

*Note: Numbers for the activity variables indicate proportions of previous activity levels. The sample was 75% female and 56.6% married; 10.2% had incomes < $15,000.*

Others have found effects on the relationship between engagement and functioning, age, gender, income, and marital status were included in the models as controls (Guralnik & Simonsick, 1993). Age was entered in the first step as a continuous variable, as were dichotomous measures of gender (male = 1, female = 0), income (less than $15,000 = 0, at least $15,000 = 1), and marital status (married = 1, not married = 0). Current levels of instrumental, social, high-demand leisure, and low-demand leisure activities and perceived nondirective emotional, nondirective instrumental, directive emotional, and directive instrumental support were entered in the second step. A two-step hierarchical regression model was used because it allows the variables to be entered in the equation in the model-defined order (Keppel & Zedeck, 1989). Tests for multicollinearity showed that variance inflation factors ranged from 1.06 to 2.86, well below 10, the cutoff for potential multicollinearity (Myers, 1990). We tested an alternative method using structural equation modeling to take into consideration the relationship between the dependent variables, the only relationship unaccounted for in two separate models. Neither the bivariate correlation between the dependent variables (−.025) nor the path between the dependent variables from the simultaneous model (−.10) was significant. Thus, we chose to use two regression models.

### Table 2. Hierarchical Regression Summaries Showing Associations Between Activity, Social Support, and Functioning (N = 244)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Physical Health</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>−.16</td>
<td>.13</td>
</tr>
<tr>
<td>Gender</td>
<td>3.94</td>
<td>1.57</td>
</tr>
<tr>
<td>Marital status</td>
<td>−1.94</td>
<td>1.56</td>
</tr>
<tr>
<td>Income</td>
<td>−2.15</td>
<td>2.24</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrumental activities</td>
<td>17.27</td>
<td>6.19</td>
</tr>
<tr>
<td>Social activities</td>
<td>19.75</td>
<td>5.12</td>
</tr>
<tr>
<td>High-demand leisure activities</td>
<td>13.42</td>
<td>3.30</td>
</tr>
<tr>
<td>Low-demand leisure activities</td>
<td>−14.03</td>
<td>5.74</td>
</tr>
<tr>
<td>Nondirective emotional support</td>
<td>.32</td>
<td>.95</td>
</tr>
<tr>
<td>Nondirective instrumental support</td>
<td>2.16</td>
<td>1.48</td>
</tr>
<tr>
<td>Directive emotional support</td>
<td>−.81</td>
<td>.90</td>
</tr>
<tr>
<td>Directive instrumental support</td>
<td>−1.12</td>
<td>.89</td>
</tr>
</tbody>
</table>

*Note: For physical health, R^2 = .047 for Step 1 (p = .035), R^2 = .255 for Step 2 (p = .0001), and R^2 = .302 for the full model (p = .0001). For mental health, R^2 = .034 for Step 1 (p = .115), R^2 = .147 for Step 2 (p = .0001), and R^2 = .181 for the full model (p = .0001).*
**Discussion**

Engagement with life and functioning were related in our sample of community-dwelling older adults, as suggested by Rowe and Kahn’s (1997) model of successful aging. Although the sample is restricted, findings provide some interesting information on the relationships between two constructs of successful aging. Maintenance of high-demand leisure, social, and instrumental activities and male gender were associated with greater physical health, and maintenance of low-demand leisure activities was associated with lower physical health. These findings are similar to those of others who found that social (Unger et al., 1997), physical (Seeman et al., 1995), and instrumental or productive (Glass et al., 1995) activities and male gender (Guralnik & Simonsick, 1993) were important for the health and functioning of older adults.

Examining mental health as a functional outcome indicated different associations. Only maintenance of low-demand leisure activities was associated with better mental health. This finding is similar to those of recent studies that have found associations between less strenuous activities and better functioning (Glass et al., 1999; Herzog et al., 1998). Older adults may require sedentary activities in addition to physical and social activities. Low-demand leisure activities may not relate positively to physical health, but they may be important for successful aging because of their effects on mental health. Low-demand leisure activities may replace work activities after retirement or changes in family demands from earlier in the lifespan. These low-demand activities may also replace more physically demanding activities that are given up because of changes in health and may be a marker for physical decline.

Social support was not associated with functioning in this study. Although both activity and social support are included in engagement with life and have been found effective in studies where they are examined separately, when engagement variables are considered together, activity may be more important for functioning than social support. Activity and social support should be considered together in future studies of successful aging to determine their relationship to functioning.

What we have found in this study are potentially modifiable factors associated with functioning that could enhance successful aging. Although these are cross-sectional data, it is important to identify modifiable risk factors so interventions can be developed to decrease the chance of functional decline (Seeman et al., 1995). Often the first activities to show decline are those unnecessary for survival (Baltes & Baltes, 1990) such as leisure and social activities. These activities can be readily observed and older adults can be made aware of the significance of changes in their activities. If older adults themselves or others notice a decrease in their usual activities, or a replacement of high-demand leisure with low-demand leisure activities, something can be done before the decrease in activity results in functional limitations. Interventions done at early stages may be more successful than those done later in reducing disability and ultimately health care costs (Verbrugge & Jette, 1994).

Although findings from this study provide information relating the engagement and functioning constructs of successful aging, limitations exist. Our sample was a random selection of members of an older adult organization, but it is not representative of the population of community-dwelling older adults. Ours was primarily a White, well-educated sample in good health. Our sample may have greater access to programs that offer the opportunity to engage in activities that could affect health. Age was not associated with functioning, and this may be due to the restricted nature and good health of our sample. Participants also reported high income, which has been associated with better health (Guralnik & Simonsick, 1993). Although we controlled for the effects of income on functioning, we had few lower income participants. Even with the shortcomings of this study, if activity engagement is related to functioning in this group, we believe they would be related in the population. Further study of these constructs with representative samples is recommended.

Another limitation of this study is the cross-sectional data that confines us to describing associations. Measures of successful aging should be tracked over time to determine the order of causality. Activity and functioning are associated, but it would be useful to determine causation. With these data we cannot say whether those who engage in activities experience better functioning or whether functioning influences activity levels.

Our limited sample provides additional information about Rowe and Kahn’s (1997) model of successful aging showing that engagement and functioning are related among older adults. Maintenance of social, leisure, and instrumental activities was associated with better functioning in terms of both physical and mental health, although low-demand leisure activities may differentially affect health. These findings suggest that activity may be a modifiable factor in successful aging that with early intervention could reduce disability and health care costs.

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