The Impact of Health Problems on Depression and Activities in Middle-Aged and Older Adults: Age and Social Interactions as Moderators

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In this study, we compared the impact of health problems (HPs) on everyday activities and depressive symptoms between middle-aged and older adults. We also examined what type and source of social interactions moderate the noxious effects of HPs. Longitudinal analyses of data with 1,802 Japanese community-dwelling adults indicated that HPs were significantly related to (a) an increase in depressive symptoms among middle-aged adults and (b) a decline in everyday activities among older adults. The former was buffered by emotional family support, whereas the latter (b) was buffered by instrumental family support and, surprisingly, by negative interactions with family. In contrast, social interactions with other friends and acquaintances did not show any moderating effect.

Many researchers have reported the relationship between health problems (HPs), such as disease or injury, and lower activities among older adults (Dargent-Molina, Hays, & Breart, 1996; Guccione et al., 1994; Mor et al., 1989). Yet, as aging per se is a normal phenomenon that leads to a limitation of activities (Dickerson & Fisher, 1993), the pathologic effects of disease on disability are sometimes confused with the results of normal aging (Pearson, 2000). However, the decline of physical function that is due to normal aging is relatively small and should not interfere with the ability of older adults to live an autonomous and high-quality life (Ferrucci et al., 2002). In fact, a noticeable percentage of persons who reach extreme longevity are still able to perform activities of daily living (ADLs; Franceschini et al., 2000). Consequently, we could expect older adults to live primarily free of disability if they do not suffer from HPs.

This assumption does not mean that the role age plays in the disablement process is negligible. For instance, Pohjasvaara, Erkinjuntti, Vataja, and Kaste (1997) examined whether ischemic strokes have an equivalent negative impact on the daily activities of younger versus older patients. They found that ADL functions deteriorated more significantly among the older patients than the younger patients after the stroke. The results suggest that older adults are more likely than younger adults to decrease their activities because of HPs. However, although most prior studies have statistically controlled for age when estimating the impact of HPs, the question of how age and HPs interact and influence everyday activities has rarely been addressed.

Psychosocial stress theory also considers HPs to be influential life events leading to a decline in psychological well-being such as depression (Holms & Rahe, 1967; Murrel, Norris, & Hutchins, 1984). Although little is known about the role of age in the stress process (Folkman, Lazarus, Pimley, & Novacek, 1987; Martin, Gruendahl, & Martin, 2001), theoretical and empirical findings suggest that HPs exert less impact on well-being in older adults than in younger adults. For example, although HPs affect middle-aged adults’ well-being by producing social role strain regarding work or parenting (Karasz & Ouellette, 1995), the number of such social roles decreases as people age (Aldwin, Sutton, Chiara, & Spero, 1996). As Krause (1994) argued, stressors will be more strongly associated with well-being when they arise in important social roles. Thus, the fewer social roles of older adults may make dealing with HPs psychologically less challenging for them than it is for middle-aged adults. Indeed, Aldwin and colleagues (1996) found that older adults were not more likely to appraise HPs in terms of loss or threat, despite the fact that they were actually dealing with HPs.

Furthermore, according to the normative life events theory, events that are not expected for a particular period in life will have a greater impact on the well-being of individuals during that particular period than on individuals during other periods (Pearlin & Lieberman, 1979). Following the logic, the higher morbidity in older adults (Bowling & Grundy, 1997; Kriegsman, van Eijk, Penninx, Deeg, & Boeke, 1997) may attenuate the psychological impact of HPs on the age group, compared with younger groups. In fact, Hurwicz, Durham, Boyd-Davis, Gatz, and Bengtson (1992) found that, although over 30% of the older adults tended to report “ill health” as the event that had had the greatest impact on them, compared with 21% of the middle-aged and 16% of the younger adults, a significant association between the ill health and depressive symptoms was revealed only in the younger adults.

Taken as a whole, the primary purpose of the present study was to examine age differences in the impact of HPs on everyday activities and depressive symptoms among middle-aged and older adults. However, disability and depression are not merely dependent on a person’s HPs but are also subject to psychosocial factors. This study also focused on one such factor, social interactions, and its role in the relationships between HPs and outcomes.
An extensive body of research has demonstrated that positive social interactions, such as social support, contribute to the improvement of a person’s psychological and physical well-being (Cohen & Willis, 1985). However, there is a growing consensus that social support is a multidimensional concept, and the type and source of support should be considered when its effect is estimated. Some studies have found that social support from friends is more effective for psychological well-being than that from family (Dean, Kolody, & Wood, 1990; Lee & Ishii-Kuntz, 1987). Others assert that family support is more effective than support from friends (Chi & Chou, 2001; Yanagisawa et al., 2002). The findings from Felton and Berry (1992) are more complicated: Emotional support was more beneficial for psychological well-being when provided by nonkin, whereas instrumental support was more beneficial when provided by kin. Regarding physical health outcomes, some researchers have found support to be beneficial in improving physical function and activities (Duke, Leventhal, Brownlee, & Leventhal, 2002; Seeman et al., 1995), whereas Mendes de Leon, Gold, Glass, Kaplan, and George (2001) have indicated that instrumental support was associated with an increase of disability risk among older adults.

Although the previous findings are not altogether consistent, a careful review of the literature by Crohan and Antonucci (1989) revealed that, whereas friends tend to play their largest role in the arenas of socialization and the provision of day-to-day companionship, support provided by family becomes important when long-term sick care or daily living help is needed. This suggests that support from family would be more beneficial than support from other relationships, at least for people suffering from HPs.

The mixed findings on the effect of support by type may be partly derived from the analytical designs. Most previous studies have focused, on one hand, on the direct effect of social support: the effect of improving well-being regardless of whether stressors, such as HPs, are present or not. The buffering effect, on the other hand, posits that support is related to well-being for persons under stress, as it protects persons from the potentially pathologic influence of stress events (Cohen & Willis, 1985). Indeed, Penninx and associates (Kriegsman et al., 1997; Penninx et al., 1997, 1998) have reported that instrumental support buffered the incidence of mobility difficulties for older people with chronic lung disease, whereas emotional support buffered the increase of depressive symptoms for older people with cardiac disease and arthritis. As Cohen and Willis (1985) argued, these findings suggest that there must be a reasonable match between the type of available support and the consequences of HPs in order for buffering to occur.

The present study also investigated how negative interactions, that is, interference and criticism dimensions of social interactions, may moderate the relationship between HPs and outcomes. Although negative interactions are theoretically assumed to exacerbate the noxious association of stressors with well-being (Shinn, Lehman, & Wong, 1984), this negative buffering, or stress-amplification hypothesis (Okun, Melichar, & Hill, 1990), has not been well established. For example, Finch, Okun, Barrera, Zautra, and Reich (1989) failed to confirm the effects of negative interactions to aggravate the associations between HPs and psychological distress in older adults. However, because their study had a cross-sectional analytical design using a relatively small sample (N = 246) and lacked attention to disability outcome, the results still have opened the door for further examination of the moderating effect of negative interactions on HPs and their consequences.

**Hypotheses and Analytic Strategy**

On the basis of the aforementioned grounds, this study examined the moderating effects of age and social interactions in the impact of HPs on everyday activities and depressive symptoms, using longitudinal data collected from Japanese middle-aged and older adults. In Japan, as in other Western countries, the population is aging rapidly, and estimating the influence of HPs on older adults’ lives has become an important issue (Health and Welfare Statistics Association, 2002). This study would contribute to the available data for developing a cross-cultural view on the experience of HPs in later life.

The analysis was twofold. First, we addressed the question of whether the impact of HPs differed between middle-aged and older adults. We expected that the impact of HPs in decreasing everyday activities would be greater in older adults, compared with middle-aged adults. In contrast, compared with older adults, middle-aged adults would be more likely to increase their depressive symptoms because of HPs. To test the hypotheses, we conducted repeated measures analyses with a mixed procedure (SAS Institute Inc., 1996) to examine pattern differences of changes in activities and depression scores according to age group and HP experience.

Second, we examined what type and source of social interactions would moderate the negative consequences of HPs. To avoid problems associated with multicollinearity, we examined in separate analyses whether the effect of HPs is moderated by the level (high vs. low) of three types of social interactions (emotional support, instrumental support, and negative interactions), provided by the two interaction sources of family and others (friends or acquaintances). We expected that social interactions with family would more effectively buffer the negative consequences of HPs than interactions with others. Furthermore, we expected that emotional support would buffer the increase of depressive symptoms, whereas instrumental support would buffer the decline of everyday activities caused by HPs. We also predicted that negative interactions would amplify the noxious effects of HPs on activities and depressive symptoms.

**METHODS**

**Participants**

The data for this study are taken from the baseline (Wave 1, from November 1997 to April 2000) and the follow-up (Wave 2, from April 2000 to May 2002) surveys of the National Institute for Longevity Sciences–Longitudinal Study of Aging (NILS–LSA). The average follow-up interval was 2.1 years. The NILS–LSA participants were Japanese community-dwelling adults between 40 and 79 years of age, randomly recruited from areas around the institute. Details of the NILS–LSA have been described elsewhere (Shimokata, Ando, & Niino, 2000). The study sample consisted of 1,802 men and women who had completed examinations at both Wave 1 and Wave 2. The average age for the entire sample was 58.3 ± 10.6 years. For
the analyses in this article, we divided the sample into two
groups according to their age at Wave 1 (older adults: 60–79
years old, n = 833; middle-aged adults: 40–59 years old, n =
969).

Measures

Health problems.—We identified HPs by using a life event
checklist at Wave 2. The trained interviewer presented par-
ticipants with the checklist of 43 items and asked them to report
the occurrence of each event between Wave 1 and Wave 2
periods. Participants who reported the occurrence of “major
injury or disease,” one of the listed items, were classified into
the HP-present (HPP) group, whereas all others were classified
into the HP-absent (HPA) group. Although information about
the type of HP was collected from the HPP participants, no
type-specific analyses were conducted in the study.

Everyday activities.—We measured everyday activities both
at Wave 1 and Wave 2 by using the Tokyo Metropolitan
Institute of Gerontology Index of Competence (TMIG-IC;-
Koyano, Shibata, Nakazato, Haga, & Suyama, 1987). This
scale includes 13 items conceptually grouped into three
categories: instrumental ADLs (using transportation, shopping,
preparing meals, paying bills, and making bank deposits and
withdrawals), intellectual or cultural activities (filling out
forms, reading papers, reading books and magazines, and
watching television), and social engagement activities (visiting
a friend’s home, helping others, going to see someone in the
hospital, and talking to others). Acceptable reliability (τ = .86)
and validity (association with mortality) of the index have been
reported (Koyano, Shibata, Nakazato, Haga, & Suyama, 1991).
Participants indicate whether or not they can perform each
activity with a “yes” (= 1) or a “no” (= 0), and then the
responses are totaled and used as an index of everyday
activities (a higher score indicates better performance). In the
study, the internal reliability of the scale was .72.

Depressive symptoms.—We measured depressive symptoms
at both Wave 1 and Wave 2 by using a Japanese version of the
Center for Epidemiologic Studies Depression (CES-D) scale
(Radloff, 1977; Shima, Shikano, Kitamura, & Asai, 1985). Par-
ticipants indicated how often during the previous week they
had experienced any of the 20 depressive symptoms described
in the scale. Each item was rated on a 4-point scale ranging
from 0 (rarely or none of the time) to 3 (most or all of the time).
Four positively worded items were reverse scored. The points
were added together so that a higher score represented a higher
level of depressive symptoms. For our sample, the internal
reliability of the scale was .91.

Social interactions.—We measured social interactions at
Wave 2, using a scale developed by Noguchi (1991). This scale
comprises three subscales: emotional support, instrumental
support, and negative interactions, each of which consists of
four items. Participants indicated whether there was someone to
provide specific interactions such as “listening to them when
they have worries or problems” (emotional support), “caring
for them when they are confined to bed for several weeks”
(instrumental support), or “being critical of them” (negative
interactions). We rated the responses on a 4-point scale, ranging
from 1 (none) to 4 (many), with higher scores indicating more
social interactions. Each item was duplicated to refer to the two
interaction sources of family and others (friends or acquaint-
ances). Summing up item scores by type and source, we
generated six social interaction measures (emotional support
from family, emotional support from others, instrumental
support from family, instrumental support from others, negative
interactions with family, and negative interactions with others).
The internal reliability of the measures ranged from .71 to .86.
For analyses, participants with scores 1 SD below the age-
specific mean of emotional support from family were classified
into the low-emotional family support group and others were
classified into the high-emotional family support group. We
conducted the same operations for the other social interaction
measures. However, for negative interaction measures, partic-
ients with scores 1 SD above the mean were classified into the
high-negative interactions group and others were classified into
the low-negative interactions group.

Control variables.—We used gender and annual family
income at Wave 1 as control variables because of their
significant associations with the outcome variables (data not
shown). We measured annual family income by using a scale
with 11 options (from 1 = income less than ¥1,500,000 to 11 =
income greater than ¥20,000,000). In addition, in the analyses
we considered the following information regarding partic-
icipants’ health status at Wave 1. Subjective health was assessed
by a single self-reported question (“How would you rate your
health?”), with five options (from 1 = very bad to 5 = very
good). The presence and history of seven diseases (stroke,
hypertension, cardiovascular disease, diabetes, bronchitis,
arthritis, and cancer) were totaled as an index of participants’
existing chronic conditions.

RESULTS

Sample Characteristics

Table 1 presents the results of bivariate tests of age dif-
ferences in the study variables. Male participants represented
just over half of the individuals in both age groups. The older
group had a significantly lower income than the middle-aged
group. The older group also felt less healthy and was in worse
condition than the middle-aged group, although the differences
were not very large. Those who reported experiencing HPs
between the surveys made up 13.9% of the older group and
11.6% of the middle-aged group, which was not significantly
different. Regarding the HP subtypes, participants who reported
disease outstripped those who reported injury and those who
reported both disease and injury or malfunctions from an
unknown cause such as indefinite complaint (categorized as
“other” in Table 1) in both age groups. The outcome variables
did not differ between the age groups, except for the TMIG-IC
score at Wave 2, which was slightly lower in the older group.
Regarding social interactions, older adults reported fewer
negative interactions with both family and others. Furthermore,
older adults reported slightly less emotional and instrumental
support from others than did middle-aged adults.
Table 1. Descriptive Information for Study Variables and Age Differences

<table>
<thead>
<tr>
<th>Variable</th>
<th>Older</th>
<th>Middle-Aged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, male (%)</td>
<td>53.4</td>
<td>51.0</td>
</tr>
<tr>
<td>Income ($M)</td>
<td>5.1 (2.4)</td>
<td>7.3 (2.0)***</td>
</tr>
<tr>
<td>Subjective health ($M)</td>
<td>3.1 (0.6)</td>
<td>3.3 (0.7)***</td>
</tr>
<tr>
<td>Chronic conditions ($M)</td>
<td>0.8 (0.8)</td>
<td>0.3 (0.5)***</td>
</tr>
<tr>
<td>HPP (%)</td>
<td>13.9</td>
<td>11.6</td>
</tr>
<tr>
<td>Disease</td>
<td>7.7</td>
<td>5.6</td>
</tr>
<tr>
<td>Injury</td>
<td>5.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Other</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>TMIG-IC ($M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave 1</td>
<td>12.3 (1.1)</td>
<td>12.4 (1.0)</td>
</tr>
<tr>
<td>Wave 2</td>
<td>12.2 (1.2)</td>
<td>12.3 (1.1)**</td>
</tr>
<tr>
<td>CES-D ($M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave 1</td>
<td>7.0 (6.7)</td>
<td>6.9 (6.2)</td>
</tr>
<tr>
<td>Wave 2</td>
<td>7.4 (6.7)</td>
<td>7.3 (6.7)</td>
</tr>
<tr>
<td>Social interactions, source--type ($M)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family--emotional</td>
<td>12.5 (2.3)</td>
<td>12.4 (2.1)</td>
</tr>
<tr>
<td>Family--instrumental</td>
<td>12.1 (2.2)</td>
<td>12.0 (2.0)</td>
</tr>
<tr>
<td>Family--negative</td>
<td>8.6 (2.4)</td>
<td>9.6 (2.2)***</td>
</tr>
<tr>
<td>Other--emotional</td>
<td>11.2 (2.7)</td>
<td>11.6 (2.5)***</td>
</tr>
<tr>
<td>Other--instrumental</td>
<td>9.0 (2.8)</td>
<td>9.3 (2.7)**</td>
</tr>
<tr>
<td>Other--negative</td>
<td>7.0 (2.3)</td>
<td>8.3 (2.3)***</td>
</tr>
</tbody>
</table>

Notes: Entries in parentheses are standard deviations. HPP = health problem present; TMIG-IC = Tokyo Metropolitan Institute of Gerontology Index of Competence; CES-D = Center for Epidemiologic Studies Depression (scale).

*p < .05; ***p < .001.

Age and the Impact of HPs

We conducted repeated measures analyses to examine pattern differences of changes in the TMIG-IC and CES-D scores according to age (middle-aged vs. older) and HP (HPP vs. HPA) groups. The design was a split plot, involving the main effects of age, HP, and time (Wave 1 vs. Wave 2), and their two-way and three-way interaction terms. Gender, income, subjective health, chronic conditions, and the baseline outcome (TMIG-IC or CES-D) were used as covariates.

The analysis indicated that, among between-subject factors, gender (female), \( F(1, 1741) = 10.88, p < .001 \), subjective health, \( F(1, 1741) = 9.45, p < .01 \), and the baseline outcome, \( F(1, 1741) = 5751.82, p < .001 \), had significant positive associations with the TMIG-IC score. No significant main effects were found for age, HP, and Age \( \times \) HP interaction. Regarding within-subject factors, time, \( F(1, 1743) = 13.32, p < .001 \), and Age \( \times \) Time, \( F(1, 1743) = 6.73, p < .01 \), were revealed to be significant, suggesting participants decreased their activities during the surveys, regardless of age or HP effects, and the decline was more rapid in the older group. However, a significant three-way interaction among Age \( \times \) HP \( \times \) Time, \( F(1, 1743) = 5.34, p < .05 \), was also revealed, suggesting that the change in the TMIG-IC score depended on the participant’s age and HP experience.

We performed the same analysis with the CES-D outcome. The results indicated that, among between-subject factors, chronic conditions, \( F(1, 1737) = 8.02, p < .01 \), and the baseline outcome, \( F(1, 1737) = 5271.15, p < .001 \), had significant positive associations with the CES-D score, whereas income, income, and the impact of HPs.
social interaction moderates (buffered or amplified) the change in TMIG-IC score over time. Similarly, for middle-aged adults with HPs, we examined whether the level of each social interaction moderates the change in CES-D score over time. The analyses tested the statistical significance of the main effect of each social interaction level and its interaction with time, controlling for gender, income, subjective health, chronic conditions, and the baseline outcome (TMIG-IC or CES-D).

The results were as follows. For older adults with HPs, significant main effects for levels of instrumental family support, $F(1, 104) = 11.09, p < .01$, emotional family support, $F(1, 101) = 6.67, p < .05$, and Negative interactions with family, $F(1, 104) = 4.45, p < .05$, emerged, with higher levels of these interactions increasing the TMIG-IC score. For middle-aged adults with HPs, significant main effects for levels of emotional family support, $F(1, 105) = 4.77, p < .05$, and instrumental family support, $F(1, 101) = 10.10, p < .01$, emerged, with higher levels of these interactions decreasing the CES-D score. No significant main effects were found for levels of other social interaction measures on both age groups, regardless of the outcome variable.

In addition to the main effects, three significant interactions emerged: Instrumental family support $\times$ Time, $F(1, 109) = 7.65, p < .01$, and Negative interactions with family $\times$ Time, $F(1, 109) = 5.55, p < .05$, in older adults, and Emotional family support $\times$ Time in middle-aged adults, $F(1, 104) = 3.97, p < .05$. The effects of these interactions are illustrated in Figures 3, 4, and 5. Among older adults with HPs, there was a significant decrease in the TMIG-IC score over time only when instrumental family support level was low, $t(109) = 3.89, p < .01$ (Figure 3). Surprisingly, there was also a significant decrease of the TMIG-IC score over time when the level of negative interactions with family was low, $t(109) = 3.95, p < .001$ (Figure 4). Among middle-aged adults with HPs, there was a significant increase of the CES-D score over time only when the emotional family support level was low, $t(104) = -2.72, p < .05$ (Figure 5).

**Discussion**

**Age and the Impact of HPs**

The three-way interaction of Age $\times$ HP $\times$ Time and the post hoc analyses indicated that the decline of everyday activities over time was statistically significant only for older adults who had experienced HPs between the surveys. The findings support our prediction that the impact of HPs in decreasing everyday activities would be greater in older adults, compared with middle-aged adults. As we noted earlier, aging per se is not so influential in limiting everyday activities of older adults (Dickerson & Fisher, 1993). However, although it is not inherently impaired, the reserve capacity to compensate for stress, metabolic derangement, and drug metabolism is increasingly limited with advancing age (Oskvig, 1999). Perhaps the age-related decline of reserve capacity in the human body allows HPs to have a greater impact on older adults, thus leading to limitations in the performance of everyday activities.

Another explanation for the difference is that the nature of HPs varies across age groups. Valderrama-Gama, Damian, Ruigomez, and Martin-Moreno (2002) argued that, whereas acute disease represents the main cause of HPs in young people, chronic conditions are more prevalent in older persons. Focusing on the type and, possibly, the severity of the HP would be the next step to developing and refining our findings.

In contrast, as we also expected, the increase of depressive symptoms over time was statistically significant only for middle-aged adults who had experienced HPs between the surveys. This is consistent with other studies (Aldwin et al., 1996; Hurwicz et al., 1992), including a Japanese one (Matsunaka, 2002), suggesting older adults are less emotionally reactive to HPs than younger adults. Thus, our results confirm the cross-cultural consistency in the psychological resilience of older adults with HPs. As we discussed earlier, because HPs threaten the salient social roles of middle-aged adults as parents or income earners (Karasz & Ouellette, 1995), they could become more critical for them and could lead to severe
psychological distress. In contrast, as disengagement theory (Cumming & Henry, 1961) implies, aging is a process whereby people gradually withdraw from society and are relieved of annoying obligations and social roles. The decreased demands from society may allow older adults to feel at ease and less stressed even when they are suffering from HPs.

Our findings would also be compatible with the normative life events theory, which posits that events that are expected for a particular period in the life span will have less impact on well-being (Pearlin & Lieberman, 1979). We found that the older group felt less healthy and was in worse condition even at the study entry, compared with the middle-aged group (see Table 1). As Norris and Murrell (1988) pointed out, the prior experience of a stressor provides "inoculation" against strong emotional reaction to a similar stressor experienced in later days. Thus, relatively worse health status at baseline in older adults might make provision against newly experienced HPs and attenuate the influence on psychological well-being.

**Moderating Effect of Social Interactions**

We found that instrumental family support buffered the decline of everyday activities in older adults, whereas emotional family support buffered the increase of depressive symptoms in middle-aged adults. In contrast, social support provided by other relationships (friends or acquaintances) did not show any buffering effect in either age group. One of the implications of the findings is that, as we expected, social support is more effective at preventing negative consequences of HPs when it comes from family rather than from other relationships. According to a hierarchical-compensatory model of social support (Cantor, 1979), people select supportive ties from a hierarchy of relationships, with family members always selected before nonfamily members. Additionally, as in other Asian countries such as China (Chi & Chou, 2001) and Korea (Mo, 1999), Japanese society maintains cultural values and traditional norms of caregiving in which the family provides care for its older members (Asahara, Momose, & Murashima, 2002). These values and norms may also strengthen the central roles of family as the support provider, especially for people suffering from HPs. However, because we aggregated friends and acquaintances into one support source category of "other relationships," the effects of key network nonkin members might be masked (Barrera, Chassin, & Rogosch, 1993). Distinguishing "other relationships" across levels of closeness would then be needed to further assess the beneficial effect of nonkin support.

Regarding the type of social support, the results also supported our predictions: Emotional support buffered the increase of depressive symptoms, whereas instrumental support buffered the decline of everyday activities. The results are in line with those of other cross-sectional findings (Kriegsman et al., 1997; Penninx et al., 1997, 1998) and the theoretical suggestion that posits that support closely linked to the specific need elicited by a stressor will exert the buffering effect (Cohen & Willis, 1985). For example, emotional support might reduce depressive symptoms caused by HPs because this type of support enhances the person's self-esteem, whereas instrumental support attenuates limitations of activities because it helps the person seek medical care for the HPs. However, contrary to our findings, Mendes de Leon and colleagues (2001) found that older adults with more instrumental support showed a decline of ADLs over time. They examined how baseline instrumental support predicts lower ADL functions at the follow-up, with no regard to the presence or absence of HPs in the study population, whereas we examined whether older adults with HPs maintain their activity level by instrumental support measured at the follow-up. The inconsistency between the studies would then be due to the differences in analytical designs.

An unexpected finding in the study is that negative interactions with family did not amplify but rather buffered the noxious effect of HPs on older adults' everyday activities. A possible explanation is that social network members may, by being critical and demanding of an older person, induce him or
her to engage in beneficial health behaviors (Lewis & Rook, 1999). For example, a wife may be critical of her diabetic husband for not following an appropriate diet (Krause, 2001). Indeed, Krause, Goldenhar, Liang, Jay, and Maeda (1993) found that negative interactions predicted more frequent exercise among older Japanese adults. Perhaps negative interactions would potentially contribute to discouraging health-compromising behavior and promoting health-enhancing behavior.

Future Directions

Some limitations should be kept in mind when our findings are interpreted. First, Lawrence and Jette (1996) described the multistep pathway in the disablment process: Presence of disease leads to anatomic and structural abnormalities, which in turn lead to restrictions in basic physical and mental actions, which then lead to difficulty performing ADLs. Analyses using a 2-point assessment method, as in our study, are too simple to examine such a multistep disablment process. Second, we did not pursue gender differences in the effects of HPs to avoid the complicated interpretation of a four-way interaction (HP × Age × Gender × Time). However, compared with men, women tend to report poorer physical health associated with chronic illness (O’Neill & Morrow, 2001) and more depressive symptoms (Nolen-Hoeksema, Larson, & Grayson, 1999). An elaborate analysis concerning these issues would modify and extend our findings.

Despite these limitations, the findings garnered from the present study add several specific points to the literature examining relationships between HPs and their negative consequences. Whereas most studies have restricted their sample to older adults or analyzed data by using age just as one of the confounders, this study made clear that the impact of HPs differs across age groups. Moreover, we highlight the importance of taking into account the type and source of social interactions when we are investigating how they moderate the impact of HPs. Although the results suggest that the relationships among HPs, everyday activities, and mental health are more complex than generally conceived, that is what makes it so challenging for researchers and professionals who are interested in stress and the development process in adulthood.

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