

The Impact of Social Ties on Depressive Symptoms in U.S. and Japanese Elderly

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This study examines the effects of social ties (with spouse, children, friends, neighbors, other relatives, and community groups) on depressive symptom levels in U.S. and Japanese adults aged 60 and over. Nationally representative survey data from the United States (N = 1,419) and Japan (N = 2,200) indicate that having a spouse, or increased contacts with friends, neighbors and relatives was associated with fewer depressive symptoms in both samples. The effects of spousal presence

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were significantly larger in the United States than in Japan. The presence of children was associated with fewer depressive symptoms in Japan only, and this effect was significantly stronger among those currently unmarried as opposed to those who are currently married. We discuss these similarities and differences between countries.

Depressive Symptoms in Older Persons

Many studies have demonstrated that the prevalence of depressive symptoms increases with age (Kennedy, 1996). Depressive symptoms or depressive disorders not only have an important place as indicators of psychological well-being, but are also recognized as significant predictors of functional health and longevity. According to studies by Bruce, Seeman, Merrill, and Blazer (1994) and Penninx et al. (1998), longitudinal data demonstrate that increased depressive symptoms are significantly associated with increased difficulties with activities of daily living. Community based data indicate that older persons with major depressive disorders are at increased risk of mortality (Bruce & Leaf, 1989; Bruce, Leaf, Rozal, Florio, & Hoff, 1994; Murphy, Monson, Olivier, Sobol, & Leighton, 1987). There are also studies that suggest that depressive disorders may be associated with a reduction in cognitive functions (Speck et al., 1995; Van Duijin et al., 1994).

Importance of Social Ties

George (1996) summarized some of the empirically well-supported effects of social factors on depressive symptoms in later life, and reported that, generally speaking, increasing age, minority racial or ethnic status, lower socioeconomic status, and reduced quantity or quality of social relations are all associated with increased depressive symptom levels. Research examining the links between social relations and depressive symptoms has frequently used social ties and social support as measures of social relations. Social ties are relatively objective indicators, chiefly assessed by marital status, frequency of contacts with social relations such as children, neighbors, and friends, and membership in organizations (Antonucci, 1990). Antonucci (1990) notes that although these measures tend to be crude in terms of psychological processes, they are relatively objective and have shown an impressive degree of predictive consistency in large population-based studies. While social support adds another dimension to conceptions of social relations, social support is often viewed as a more subjective aspect of social relations than social ties (Antonucci, 1990). As one of the serious difficulties in conducting cross-national research is the potential for non-equivalence of research terms and concepts (Hantrais & Mangen, 1996), it is not surprising that the use of social ties measured in cross-national comparisons seems more convenient and straightforward than using more difficult-to-specify indicators of social support. We use

several such “objective” indicators of social ties, described below, leaving aside a fuller discussion of the differences between the U.S. and Japan in how social ties are constructed, construed, and maintained in the U.S. and Japan.

Social Ties and Depressive Symptoms

In previous studies, links between social ties and depressive symptoms have been examined for each component type of social tie: spouse, children, friends/relatives, and community organizations. These relationships have been studied cross-sectionally, and also in longitudinal designs. This study mainly reviews evidence collected in the West, and especially in the United States, since relatively few studies of this type are found in non-Western societies.

Findings from several studies document high rates of depressive symptoms in the elderly after loss of a spouse, although a few studies contradict these findings (Turvey, Carney, Arndt, Wallace, & Herzog, 1999). Most studies we have reviewed concentrate on one racial or ethnic group at a time, but at least one report suggests that marital status interacts with race when modeling depressive symptom etiology (Williams, Takeuchi, & Adair, 1992). It is unclear whether or not these findings in Western societies would hold in Japan, not only because there are few studies on the effects of Japanese marital status in this context (and these findings are inconsistent), but also because perceptions of racial homogeneity in Japan have simply (until very recently) made such research meaningless. Two studies suggest significant associations between having a spouse and lower depressive symptoms (Ueno et al., 1997; Osada, Shibata, Haga, & Yasumura, 1995). However, two other studies failed to demonstrate this relationship (Aoki, 1997; Muraoka, Oiji, & Ihara, 1996).

The childless have been identified as a vulnerable group of older adults, because family, especially adult children, are often the main resources available to provide emotional and instrumental support for those in old age (Koropecj-Cox, 1998). On the one hand, a few studies on the link between childlessness and depressive symptoms have been found in the literature, but on the other hand some studies report that childlessness is not necessarily linked with high depressive symptoms among older adults (Koropecj-Cox, 1998; Beckman & Houser, 1982). Two different explanations for the lack of significant effects have been suggested (Koropecj-Cox, 1998). One view proposes that unmarried and childless older adults obtain needed emotional and instrumental support from other kin such as siblings, from friends, or from neighbors. A second view holds that adult children are not necessarily positive resource providers even if present, demonstrating that relationships with children are often stressful, and sometimes fraught with unwelcome reciprocal obligations.

Masuchi and Kish (2001) reported on five studies that demonstrated significant links between contact with friends and reduced depressive symptom

prevalence, while an additional three reported no significant relationships. In terms of self-esteem, life satisfaction, or happiness apart from depressive symptoms per se, a meta-analysis by Pinqart and Sorensen (2000) documents that having contacts with friends was more strongly associated with these subjective indicators of well-being than having contacts with adult children. In order to explain these findings, they posit two views. First, because friendships are characterized as voluntary relations, friends may give emotional support and contribute to net subjective well-being to a greater extent than do those defined simply by structurally determined family relationships. Second, friends are typically about the same age and often share similar cohort experiences, lifestyles, and residential proximity. These factors may promote high levels of satisfaction, and thus larger friendship effects are found in these empirical studies of the correlates of subjective well-being.

Several studies (Stallones, Marx, & Garrity, 1990; Palinkas, Wingard, & Barrett-Connor, 1990) report that higher levels of involvement in community organizations were associated with fewer depressive symptoms. Also, a few studies of Japanese elderly indicate significant links between involvement in community organizations and declines in depressive symptoms or depression rates (Muraoka et al., 1996; Aoki, 1997).

Most existing studies, however, are characterized by several limitations. First, most studies are narrowly focused on the effects of a particular type of social tie (e.g., spouse, children, or friends), and few studies compare the degree of depressive symptom reduction by type of social tie. Second, previous studies chiefly examine the direct effect of social ties, while potential interactive effects among social ties on depressive symptoms tend not to be examined. For example, for those who are widowed, the existence of adult children or contacts with friends may contribute strongly to observed depressive symptom reduction through a "substitution effect" for the lost spousal support, while for those who still have a spousal tie the existence of children may not make as large a contribution to a reduction in depressive symptoms (Koropecky-Cox, 1998). Third, as mentioned above, there are many studies that examine the links between social ties and depressive symptoms, but these usually focus on one country alone, or on a small number of countries with similar cultural or linguistic heritages, and they are usually conducted in the West.

Aims of the Study

The purpose of this study was to examine the direct and conditional effects of key social ties (spousal presence, living with children, contact with friends/neighbors/relatives, and participation in community groups) on depressive symptoms in U.S. and Japanese persons aged 60 and over.

The comparative perspective may contribute to a greater understanding of the links between social ties and depressive symptoms. Palmore and Maeda (1985)

and Hashimoto (1996) point out that although the economic system in Japan has become similar to that of other highly industrialized countries, Japan's cultural traditions have nevertheless maintained a relatively high degree of social integration for the aged. They discuss two main roots of Japanese respect for the elderly: social relations largely governed by vertical relationships, and a lasting historical influence of Confucian filial piety. Relations between elders, adult children, and grandchildren typically take place within the "household" in Japan, which is governed by an adult male "head." Similarly, most other interpersonal relationships in Japan are determined by finely nuanced vertical hierarchies (Nakane, 1970).

This is in marked contrast to social relations governed by horizontal relationships, such as with friends and other voluntary associations in the United States. These differences in how social ties are constructed and maintained (vertical versus horizontal) may create differences in how social ties and depressive symptoms are linked in the United States and Japan and unanswered questions about these differences motivate the current work.

Study Hypotheses

This study examined four hypotheses.

1. Following the argument articulated by Palmore and Maeda (1985), it is suggested that intimacy with one's spouse has deeper cultural roots in putatively horizontal societies such as the United States than in putatively vertical societies such as Japan. In one empirical study (Sugisawa, Okabayashi, Nakatani, Fukaya, & Shibata, 1998), married elderly in the U.S. show higher levels of emotional support and lower levels of negative support from one's spouse than do married elderly in Japan. Indeed, because men in Japan tend to spend disproportionately less time at home during the working years than do men in the United States, after retirement couples in Japan purportedly have a harder time reintegrating each other into the day-to-day life of the household than do couples in the United States. In a recent newspaper account, a Japanese physician was quoted as saying: "Elderly couples are reaching retirement age without ever once having had a real conversation. . . . Spending time together becomes a huge burden" (Sakurai, 2000). These differences between Japan and the United States highlight the potentially different impact of spousal presence in each country. Consistent with this literature, the first hypothesis to be examined states the following, H_1 : *Having a living spouse is associated with lower levels of depressive symptoms in the U.S. sample relative to levels observed in the Japanese sample.*
2. Palmore (1975), along with Kawai (1981) and others, argues also that older persons in Japan are more closely integrated with their children and grandchildren

than older persons in the United States. In a nationally representative survey, Koyano and colleagues (1994) found that Japanese elders perceived the most dependable sources of both emotional and instrumental support to be family members living together, followed by children living apart. Further, a cross-cultural study demonstrated that Japanese elders are more likely to regard their children as dependable sources of such support than do elders in the United States. (Director-Generals Secretariat Policy Office for the Aged, Japanese Management and Coordination Agency, 1996). This study also showed the historical propensity of Japanese elders to exhibit a stronger preference for living together with children than do elders in the United States. These findings lead to the second hypothesis to be evaluated here, *H₂: Having a child (or children), and living together with one or more children, is associated with lower levels of depressive symptoms in the Japanese sample relative to levels observed in the U.S. sample.*

3. Further, these same cross-cultural studies suggest higher social participation and emotional support among friendships in the United States relative to friendships in Japan. Similarly, in the study by Koyano and his colleagues of Japanese elders, neighbors and friends were perceived as only "slightly dependable" sources of support (1994). The United States, contrary to some popular prevailing beliefs, has not been a particularly family-centered society but a society comprised of various strains of individualism based on voluntary association (sometimes contractual), mutual aid between non-kin persons (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1996), and a general cultural propensity to horizontal rather than vertical relationships (Palmore, 1975). Based on these studies, the third hypothesis to be tested here is, *H₃: The impact of friendships and involvement in community organizations on levels of depressive symptoms is more marked in the U.S. sample than in the Japanese sample.*
4. The fourth set of issues to be explored is the impact of social ties on depressive symptoms by marital status and culture, as discussed above. We outline four related hypotheses, *H_{4A}: The effect of having a child either living together or apart in Japan on the level of depressive symptoms in the elderly is greater among the unmarried than among the married. H_{4B}: Contacts with friends/neighbors/relatives or participation in community organizations in Japan can substitute for spousal presence in any observed reduction of depressive symptoms. H_{4C}: The effect of having a child either living together or apart in the United States on the level of depressive symptoms in the elderly is greater among the unmarried than among the married. H_{4D}: Contacts with friends/neighbors/relatives or participation in community organizations in the United States can substitute for spousal presence in any observed reduction of depressive symptoms.*

Methods

Data

The U.S. data were derived from Wave I of the Americans' Changing Lives Survey (ACL), conducted in 1986 by the University of Michigan's Survey Research Center (House, 1997). Identification of ACL sample respondents was conducted using a four-stage probability sampling process: Primary sampling was of U.S. Standard Metropolitan Statistical Areas and counties, followed by a second stage sampling of area segments, a third stage sampling of housing units within the sampled area segments, and concluding with the random selection of respondents from selected housing units. The study successfully interviewed 3,617 persons aged 25 years and older (response rate: 67%), with an oversampling of African Americans 60 years of age or older. African Americans 60 years of age or older were sampled at twice the rate of White respondents that age. By adding a one-half random selection from this African American oversample to the White sample, a nationally representative sample of 1,419 respondents was adopted for these analyses.

In cross-cultural empirical studies, the comparability of measures is one of the most important issues to address. Hence, the Japanese survey questionnaires we used were developed directly from the ACL questionnaires by an extensive translation, back translation, retranslation, and pilot testing process in order to ensure a very high degree of comparability. In addition, the Japanese survey was undertaken as the baseline survey for a longitudinal national study designed to run for more than ten years, with follow up interviews planned at three-year intervals.

The baseline Japanese survey was conducted in 1987 by researchers (including authors Hidehiro Sugisawa and Hiroshi Shibata) at the Tokyo Metropolitan Institute of Gerontology following a two-stage stratified national probability sampling procedure comparable to that used in the ACL study. The primary sampling units comprised the 192 Enumeration Districts contained in the 1985 Japanese census. In the second stage of the sampling procedure, eligible subjects were selected at random in each primary sampling unit by an equal interval method. A total of 2,200 interviews were successfully completed from the list of 3,288 eligible subjects, reflecting a response rate of 66.9%.

Measurements

Our primary dependent measure is depressive symptoms, as assessed by the short version of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; Radloff & Teri, 1986; O'Hara, Kohout, & Wallace, 1985). The CES-D is a brief self-report measure of depressive symptoms widely used in epidemiological research, including the ACL survey in the United States from which the Japanese version of the CES-D measure was translated. Yatomi and his

coworkers (1993) argued persuasively that two of the positive affect items of the CES-D should be dropped from cross-cultural studies between Japan and other Western countries, based on cross-cultural comparisons of the factor structure of the CES-D data. Following their argument, we dropped two positive affect items ("I am happy," and "I enjoy life") from both the Japanese and U.S. ACL data sets for these analyses. As a result, our dependent measure includes 9 items. Response categories and respective scores for the scale items are: "Hardly ever = 0," "Some of the time = 1," and "Most of the time = 2." Higher total sums of item scores on the CES-D indicate higher levels of depressive symptoms. We calculated Cronbach alpha coefficients of internal consistency for the CES-D scale to be .788 in the U.S. sample and .796 in the Japanese sample. Nunnally (1978) suggests that scales used in applied studies should generally have alphas over .7. Since the Japanese and ACL versions are otherwise identical, we are satisfied with the psychometric performance and comparability of these two measures of depressive symptom level.

Our measures of social ties were based on marital status, children's location of residence, face-to-face contacts with friends, neighbors or relatives, and involvement in community organizations. Marital status was dichotomized in an indicator variable: the value of "1" was given when a spouse lived together with the respondent, and "0" when this condition was not satisfied. Children's location of residence was composed of three categories: (a) living together, (b) living apart (after excluding those with children also living with respondent), and (c) not having a child (reference). The frequency of face-to-face contacts with friends, neighbors, or relatives, and involvements in community organizations and their respective item scores were divided into six ordinal categories: "More than once a week = 10," "Once a week = 4," "Two to three times a month = 2.5," "Once a month = 1," "Less than once a month = 0.5," and "None = 0." Hence, higher scores were assigned to those with greater frequency of contact or frequency of participation.

In previous studies, age, sex, educational attainment, presence of physical diseases, and functional capacity were associated with depressive symptoms (Beekman, Copeland, & Prince, 1999). These variables were entered as control variables in this study. Age and educational attainment were used as continuous variables. Male/female status was dichotomized in an indicator variable: The value of "1" was assigned to male status, and "0" was assigned to female status. Similarly, the value of "1" was assigned with the presence of any one (or more) of bone and joint disease, respiratory disease, high blood pressure, heart disease, diabetes mellitus, stroke, or peripheral vascular disease, and "0" otherwise. In the case of incompetence in any one of three items of functional incapacity, bathing, climbing stairs, or walking, the value of "1" was given if incapacitated, and "0" otherwise.

Analytical Procedure

First, distributions in the form of frequencies and percentages, and measures of central tendency for all independent and dependent variables were reviewed. We tested for differences between the Japanese and U.S. samples with χ^2 tests for nominal-level, and *t*-tests for interval-level variables. Second, we examined the interrelationships among the independent variables to test for multicollinearity. We first examined a matrix of bivariate Pearson correlations (*rs*) and found no worrisome correlations. Next, we regressed each independent variable on all the other independent variables and examined the resulting R^2 s, which are the estimated proportions of variability in the dependent (test) variable accounted for by the multiple regression equation. Tolerance levels were calculated as $(1 - R^2)$ and we observed all tolerance levels to be over 0.7, suggesting that multicollinearity among our independent variables is very unlikely (Fox, 1997). Third, we used ordinary least squares regression to estimate the effects of social ties on depression symptom level. We conducted separate regressions on the U.S. and Japanese samples. To examine the direct effects, regression analyses were performed by entering all independent variables, including social ties measures, simultaneously. Fourth, to examine interactions between social ties and marital status, unmarried and married subsamples were analyzed separately. Finally, in order to test for interactions between social ties and country, or between social ties and marital status, we followed a method also used by Su and Ferraro (1997), and detailed by Marascuilo and Levin (1983), to test for differences of slopes. The test statistic (*t*) was calculated according to formula (1), $t = \frac{b_1 - b_2}{\sqrt{SE_1^2 + SE_2^2}}$, where *b* refers to the unstandardized regression coefficients and *SE* refers to the standard errors of *b*.

Results

We first describe and compare measures of central tendency for all independent variables and the CES-D dependent measure for both U.S. and Japanese samples. The proportions of those who are married (62.8% v. 52.9%, $p < .001$) and those who are living with children (60.4% v. 17.4%, $p < .001$) are both higher in the Japanese sample than the U.S. sample. The proportion of those with children living elsewhere (35.4% v. 69.5%, $p < .001$) and those with no children at all (5.2% v. 13.1%, $p < .001$) are both higher in the United States. The reported mean frequency of contacts with friends/neighbors/relatives (3.19 v. 4.06 on pseudo-interval scale, $p < .001$), and the frequency of participation in community organizations (1.33 v. 1.98 on pseudo-interval scale, $p < .001$) are slightly higher in the U.S. sample than the Japanese sample. The samples are comparable in terms of age (69.1_{Japan} v. 70.0_{U.S.} mean yrs., $p < .001$). The Japanese sample is comprised of a lower proportion of females (54.8% v. 67.4%, $p < .001$), and a lower mean level of educational

attainment (8.63 v. 10.6 yrs., $p < .001$) than the U.S. sample. Those in the Japanese sample were far less likely than those in the U.S. sample to report the presence of a disease comorbidity (46.1% v. 84.6%, $p < .001$) or a functional incapacity (10.1% v. 39.9%, $p < .001$). Finally, elders in the Japanese sample reported lower mean CES-D depressive symptom levels than did elders in the U.S. sample (1.14 v. 3.64, $p < .001$).

Table 1 shows the coefficient estimates of regressing CES-D depressive symptom level scores on social ties measures and other confounding factors, for the Japanese and U.S. samples separately. An interesting finding was that marriage was associated with lower levels of depressive symptoms in both the Japanese ($b = -.295$, $p < .05$) and U.S. ($b = -.808$, $p < .01$) samples. And in support of our first hypothesis (H_1), the contribution of having a spouse to a reduction in depressive symptom levels was larger in the U.S. sample relative to the Japanese sample ($t = 2.4$, $p < .05$).

Again, in Table 1, we observed that having a child, regardless of his or her living situation, was associated with a decline in depressive symptom levels in the Japanese sample, but not in the U.S. sample. The second hypothesis (H_2), that

Table 1. Contributions of Social Ties and Other Confounding Factors to CES-D Scores in Multiple Regression Analyses in the Japanese and U.S. Samples

| Variables | The Japanese sample ($n = 1,992$) | | | The U.S. sample ($n = 1,230$) | | | t^b |
|--|--|-------|--------|------------------------------------|-------|--------|---------------------|
| | b | Beta | (SE) | b | Beta | (SE) | |
| Presence of spouse | -.295* | -.067 | (.114) | -.808** | -.134 | (.177) | 2.436* |
| Children's residence ^a | | | | | | | |
| Living together | -.639** | -.149 | (.214) | -.419 | -.052 | (.300) | -.597 |
| Living separately | -.711** | -.161 | (.221) | -.079 | -.012 | (.248) | -1.902 ⁺ |
| Frequency of contacts with friends, neighbors, and relatives | -.037* | -.056 | (.015) | -.067* | -.066 | (.028) | .944 |
| Frequency of participations at community organizations | -.018 | -.021 | (.021) | -.028 | -.026 | (.030) | .273 |
| Age | .003 | .010 | (.007) | -.025* | -.062 | (.012) | 2.015* |
| Sex (Male = 1) | -.313** | -.074 | (.107) | -.161 | -.025 | (.175) | -.741 |
| Educational attainment | -.012 | -.017 | (.017) | -.125** | -.147 | (.023) | 3.950** |
| Presence of disease | .225* | .053 | (.094) | .865** | .107 | (.223) | -2.644** |
| Functional incapacity | .977** | .131 | (.170) | 1.561** | .254 | (.175) | -2.393* |
| Intercept | 1.961 | | (.593) | 6.134 | | (.982) | |
| R^2 | .051 | | | .155 | | | |

Note. *ns* slightly reduced due to missing data for some variables; b = unstandardized, Beta = standardized regression coefficients; SE = standard errors of the unstandardized coefficients; R^2 = proportion of variance in the dependent variable (CES-D) explained by the model.

^aUsing no children as the reference group.

^bThis t statistic (see formula [1] in text) tests for differences of bs between the two countries. The U.S. sample was used as the reference group.

⁺ $p < .10$, * $p < .05$, ** $p < .01$.

having a child who either lived together ($b = -.639, p < .01$) or lived apart ($b = -.711, p < .01$) would have a more marked impact on the decline in depressive symptoms in the Japanese sample relative to the U.S. sample ($b_{\text{living together}} = -.419, p \geq .10$; $b_{\text{living separately}} = -.079, p \geq .10$), is only moderately supported, and only for those with children living apart ($t_{\text{living separately}} = -1.902, p < .10$). Although we did not formally test this, the strength of the effects of either living with a child or living apart from a child did not appear to differ in Japan. However, in the U.S., there did appear to be a slightly greater impact on depressive symptom level reduction for those with children living together than for those with children living separately.

Increasing frequency of contact with friends/neighbors/relatives was associated with very modest declines in depressive symptoms in both the Japanese ($b = -.037, p < .05$) and U.S. ($b = -.067, p < .05$) samples. But we found no evidence that there was any difference between the Japanese and U.S. samples ($t = .944, p \geq .10$). In the case of involvement in community organizations, the effects on depressive symptom levels were not significant in either the Japan ($b = -.018, p \geq .10$) or the U.S. ($b = -.028, p \geq .10$) samples, although the direction of both unstandardized and standardized coefficients is in the predicted direction (i.e., that greater involvement would be associated with lower levels of depressive symptoms). Hence, we have no evidence to support the third hypothesis (H_3).

In order to examine differences in the contributions of social ties to depression symptom levels by marital status, we regressed depressive symptom levels on the set of independent variables separately for married and unmarried respondents, for both the Japanese and U.S. samples. In the Japanese data (Table 2), while having a child and parent either living together ($b_{\text{living together}} = -.983, p < .01$) or apart ($b_{\text{living separately}} = -1.099, p < .01$) was associated with significant reductions in depressive symptoms among the unmarried, no such effect was present among the married ($b_{\text{living together}} = -.101, p \geq .10$; $b_{\text{living separately}} = -.179, p \geq .10$), although the direction of the coefficients were the same. The difference between the unmarried and married was significant for both those living together ($t = 1.985, p < .05$) and those living separately ($t = 1.965, p < .05$), hence we have strong evidence to support H_{4A} . We found no evidence, however, to support H_{4B} : Contacts with friends/neighbors/relatives were not associated with any change in depressive symptom levels for either the unmarried ($b = -.057, p \geq .10$) or married ($b = -.027, p \geq .10$). Participation in community organizations was also not associated with any change in depressive symptom levels for either the unmarried ($b = -.008, p \geq .10$) or married ($b = -.026, p \geq .10$). There were no differences in these b coefficients between the unmarried and married for either contacts with friends/neighbors/relatives ($t = .870, p \geq .10$) or participation in community organizations ($t = -.376, p \geq .10$).

In the U.S. data (Table 3), however, there are no effects of either having a parent and a child living together ($b_{\text{living together}} = -.278, p \geq .10$) or apart

Table 2. Contributions of Social Ties and Other Confounding Factors to CES-D Scores in Multiple Regression Analyses in the Married and Unmarried Japanese Subsamples

| Variables | The married subsample (<i>n</i> = 1,274) | | | The unmarried subsample (<i>n</i> = 718) | | | <i>t</i> ^b |
|--|--|-------|-----------|--|-------|-----------|-----------------------|
| | <i>b</i> | Beta | <i>SE</i> | <i>b</i> | Beta | <i>SE</i> | |
| Children's residence ^a | | | | | | | |
| Living together | -.101 | -.028 | (.281) | -.983** | -.183 | (.344) | 1.985* |
| Living separately | -.179 | -.049 | (.284) | -1.099** | -.187 | (.372) | 1.965* |
| Frequency of contacts with friends, neighbors, and relatives | -.027 | -.048 | (.017) | -.057 | -.072 | (.030) | .870 |
| Frequency of participation at community organizations | -.026 | -.034 | (.023) | -.008 | -.008 | (.042) | -.376 |
| Age | .012 | .041 | (.008) | -.009 | -.028 | (.014) | 1.302 |
| Sex (Male = 1) | -.383** | -.102 | (.108) | -.143 | -.021 | (.260) | -.852 |
| Educational attainment | -.014 | -.022 | (.018) | -.007 | -.008 | (.036) | -.173 |
| Presence of disease | .057 | .016 | (.103) | .495** | .099 | (.188) | -2.043* |
| Functional incapacity | .743** | .102 | (.206) | 1.229** | .163 | (.297) | -1.344 |
| Intercept | .675 | | (.658) | 3.049 | | (1.114) | |
| <i>R</i> ² | .023 | | | .050 | | | |

Note. *ns* slightly reduced due to missing data for some variables; *b* = unstandardized, Beta = standardized regression coefficients; *SE* = standard errors of the unstandardized coefficients; *R*² = proportion of variance in the dependent variable (CES-D) explained by the model.

^aUsing no children as the reference group.

^bThis *t* statistic (see formula [1] in text) tests for differences of *bs* between the two subsamples. Unmarried was used as the reference group.

p* < .05, *p* < .01.

(*b*_{living separately} = -.132, *p* ≥ .10) on depression levels among the unmarried. Similarly, there are no effects of either having a parent and a child living together (*b*_{living together} = -.476, *p* ≥ .10) or apart (*b*_{living separately} = .014, *p* ≥ .10) on depression levels among the married. There were no differences in these *b* coefficients between the unmarried and married for either living together (*t* = -.307, *p* ≥ .10) or living apart (*t* = .273, *p* ≥ .10), hence, we found no evidence to support *H*_{4C}. We also found no evidence to support *H*_{4D}: Contacts with friends/neighbors/relatives in the U.S. were not associated with any change in depressive symptom levels for either the unmarried (*b* = -.080, *p* ≥ .10) or married (*b* = -.057, *p* ≥ .10). Participation in community organizations was also not associated with any change in depressive symptom levels for either the unmarried (*b* = -.005, *p* ≥ .10) or married (*b* = -.057, *p* ≥ .10). There were no differences in these *b* coefficients between the unmarried and married for either contacts with friends/neighbors/relatives (*t* = -.405, *p* ≥ .10) or participation in community organizations (*t* = -1.002, *p* ≥ .10). To summarize, neither the presence of children or their living status, the frequency of contacts with friends/neighbors/relatives, or the frequency of participation in community organizations had any significant effects on the levels of depressive symptoms in the United States, but the presence of children did mitigate

Table 3. Contributions of Social Ties and Other Confounding Factors to CES-D Scores in Multiple Regression Analyses in the Married and Unmarried U.S. Subsamples

| Variables | The married subsample (<i>n</i> = 667) | | | The unmarried subsample (<i>n</i> = 563) | | | <i>t</i> ^b |
|--|--|-------|-----------|--|-------|-----------|-----------------------|
| | <i>b</i> | Beta | <i>SE</i> | <i>b</i> | Beta | <i>SE</i> | |
| Children's residence ^a | | | | | | | |
| Living together | -.476 | -.059 | (.500) | -.278 | -.035 | (.406) | -.307 |
| Living separately | .014 | .002 | (.420) | -.132 | -.020 | (.328) | .273 |
| Frequency of contacts with friends, neighbors, and relatives | -.057 | -.058 | (.037) | -.080 | -.076 | (.043) | -.405 |
| Frequency of participation at community organizations | -.057 | -.055 | (.039) | .005 | .005 | (.048) | -1.002 |
| Age | -.016 | -.038 | (.017) | -.033 | -.079 | (.017) | .707 |
| Sex (Male = 1) | -.348 | -.063 | (.205) | .217 | .028 | (.316) | -1.499 |
| Educational attainment | -.114** | -.139 | (.031) | -.130** | -.147 | (.036) | .336 |
| Presence of disease | .658* | .095 | (.262) | 1.237** | .132 | (.392) | -1.228 |
| Functional incapacity | 1.514** | .265 | (.223) | 1.613** | .248 | (.278) | -.277 |
| Intercept | 4.804 | | (1.366) | 6.280 | | (1.409) | |
| <i>R</i> ² | .139 | | | .122 | | | |

Note. *ns* slightly reduced due to missing data for some variables; *b* = unstandardized, Beta = standardized regression coefficients; *SE* = standard errors of the unstandardized coefficients; *R*² = proportion of variance in the dependent variable (CES-D) explained by the model.

^aUsing no children as the reference group.

^bThis *t* statistic (see formula [1] in text) tests for differences of *bs* between two subsamples. Unmarried was used as the reference group.

p* < .05, *p* < .01.

expression of depressive symptoms for the unmarried in Japan, lending support only to *H*_{4A}.

Discussion

This study supports the first hypothesis, that having a spouse has a stronger impact on depressive symptom reduction in the United States than in Japan. In addition, we observed that spousal presence contributes to a decline in depressive symptoms in the Japanese sample as well as in the United States sample. Although it has been thought that intimacy with one's spouse is weaker in vertical societies (such as Japan) relative to horizontal societies (such as the United States), and that the Japanese married elderly receive lower levels of emotional support and higher levels of negative support from their spouse than do married elders in the United States (Sugisawa et al., 1998), the importance of spousal presence in mitigating the expression of depressive symptoms is suggested here even in a vertical society.

Although the second hypothesis is partially supported in this study, unexpectedly, the effects on depressive symptoms of having adult children either living

together or living apart from elders were almost the same in the Japanese sample. The stem family structure, in which elders live together with the oldest son, his wife, and their grandchildren, is more common in Japan than the United States. The most often cited factors for this structural arrangement have been rooted in values thought to be indigenous to Asian cultures, particularly a respect for age and filial piety, derived from Confucian ethics (Kamo, 1988). However, "indigenous culture" explanations may not have a particularly large role to play in a decline in reported levels of depressive symptoms. Japanese intergenerational relationships between elderly parents and their adult children have become more affection-based, convenience-oriented, and free from the norm of filial piety than has historically been the case (Koyano, 1996). In addition, co-residence based on economic necessity is not as salient a reason for such arrangements as has historically been the case in Japan (Martin & Tsuya, 1991). These changes may mitigate any decline in depressive symptoms due to the effects of living with an adult child. In addition, it is even possible that living with a child has harmful effects on the mental health of elders. Ueno et al. (1981) suggest, perhaps counterintuitively, that elders who co-reside in stem families have higher suicide rates than do elders living alone. In order to avoid burdensome social interactions with older parents in Japan, especially between mothers-in-law and daughters-in-law, some families forgo the choice of co-residence, and consequently the choice of caregivers will also tend to shift from informal to formal resources.

In this study, the third hypothesis is not supported; we found only very modest associations between contacts with friends/neighbors/relatives and depression in Japan and the United States. There was no difference between countries in these effects. On the one hand, the Japanese remain committed to family structures rooted in verticality in terms of relations with adult children, but on the other hand, there are signs that they are incorporating some aspects of horizontal structures into their relations with non-kin persons (Kumagai, 1995; Wada, 1995). The effects of involvement in community organizations on depression were not significant in either country. A complementary finding in a study of elders in five Asian countries by Su and Ferraro (1997) shows that the integrative effects due to participation in voluntary associations are weak in explaining variation in measures of self-rated health. It appears that participation in community organizations in Japan is as likely to be burdensome for the elderly as it is to confer any measurable reductions in expressed levels of depressive symptoms. One explanation of this weak link could be that community organizations "artificially" involve members from diverse backgrounds who are different enough from each other to moderate the formation of intimate friendships, a social tie about which we *did* find evidence of positive consequentiality to psychological well-being.

A related explanation derives from the "voluntariness" of participation in so-called voluntary associations in Japan, and how much benefit one might expect to see by participating in activities that are possibly of extremely low salience to

those involved. Japanese analysts describe many social relations and behaviors in terms of where they fall between extremes of obligatory, essentially non-voluntary compulsory relationships or behaviors (*giri*), and voluntary, affective, personal, highly reciprocal, and “higher order” relations or behaviors (*ninryo*; Befu, 1968; Hayashi, 1975; Numata, 1974; Wierzbicka, 1991). In the United States, there may be a trend away from participation in group or civic activities towards greater willingness to “bowl alone” or otherwise engage oneself in activities that are highly individual, even if conducted in the presence of others (e.g., sitting in a darkened movie theater, or watching television in the “family room”; Putnam, 2000). What exactly are the health benefits of maintaining social ties that may be merely obligatory in Japan, or of dwindling import due to a preference for more individual activities in the United States? Finally, there is some evidence from modernization theorists that Japanese are edging closer to U.S. and other Western ideals of social relations in recent decades (Kumagai, 1995). Alternative hypotheses derived from these explanations might help interpret our findings with respect to social ties with friends/neighbors/relatives.

The fourth hypothesis is only partially supported: The presence of children among the unmarried in Japan is associated with reductions in depressive symptom levels. It is possible that the reduction in depressive symptoms is because of a “substitution effect” whereby children of unmarried elders become more involved in the caregiving of the elder only after a change of status into “unmarried,” most often due to the death of the spouse. Although divorce rates in Japan have been rising, they still remain relatively low compared to the United States (Nonoyama, 2000). In the United States, however, we find no evidence that there is a comparable substitution for spousal presence in the currently unmarried. To the contrary, it is to the married elders in the United States that co-residence with adult children confers the greatest benefit (in terms of depressive symptom reduction) relative to either the unmarried, or to those with children living separately, but as noted above, these benefits were neither great in magnitude nor statistically significant. Clearly, further analysis and additional studies are necessary to further explore these complex interactions.

Apart from the main hypotheses about social ties tested above, it is also interesting to note (in Table 1) that the presence of poor physical health is associated with increases in depressive symptom levels in both Japan and the United States, and this effect is significantly stronger in the United States than in Japan. According to one cross-national analysis (Su & Ferraro, 1997), modernization tracks with an increased salience of social contributions to self-rated health, possibly because workplace productivity is valued more in these economies (cf. Parsons’s “sick role” [Munakata, 1986]). It seems self-evident that poor physical health or high levels of functional incapacity lead to reduced levels of social interaction or to reduced workplace productivity, and that these “functional” processes are comparable in the modern economies of both Japan and the United States even if the magnitude of the

effect is more pronounced in the more “modernized” economy of the United States. From a socio-cultural point of view, additional explanations for the differences are possible. The first explanation refers to the differences of social policy in both countries. Medical insurance programs may weaken any potential negative impacts of poor physical health to a greater extent in Japan than in the United States because Japan has established medical insurance programs with much wider coverage than is typical in the United States (Ikegami & Campbell, 1995; Ohi, Akabayashi, & Miyasaka, 1998). In addition, differences in cultural values may cause this discrepancy. As mentioned with respect to the effects of children on elders’ well-being, behaviors and attitudes in Japan appear to be influenced not only by the United States and other Western cultures, but also by strong historical ties to traditions of vertically oriented relationships, in which productivity per se is but one of many virtues (MacKellar & Horlacher, 2000).

These findings must be considered within the context of the limitations of this study. First, the cross-sectional design inhibits causal specification of the linkages between social ties and depressive symptoms. Longitudinal designs are necessary to specify any causal linkages. Second, as noted above, although measures of social ties are generally construed by analysts as more objective measures than other measures of social support, they are nonetheless likely to be constructed and maintained by different mechanisms in different societies to potentially different ends, hence some caution is warranted here (and in all cross-cultural research) not to mistake similar social morphologies as having similar social consequences (Walters, Warzywoda-Kruszynska, & Gurko, 2002). Third, although the data used in this study are of relatively high quality, the surveys that produced them are themselves aging; the U.S. data were obtained from a survey conducted in 1986, and the Japanese data were obtained from a survey conducted in 1987. However, there are few alternatives to using these data because there are few data sets specifically constructed for such cross-national comparisons. Finally, the living arrangements and patterns of social ties formation and maintenance of the elderly in both countries have changed somewhat since these surveys were conducted. Japanese cultural values based on filial piety and relationships between the elderly and their children have changed in complex ways. There is indeed some evidence to support this view (Koyano, 1989; Tsutsumi, 2001; Wada, 1995). Fewer adult children in Japan are choosing to live with their aging parents than was the case in recent decades (Nonoyama, 2000). There is also a trend towards internal migration from rural to urban and suburban areas that is greater for younger than older adults, with aging parents tending to remain in more rural areas or in older but valuable urban dwellings (Kuroda, 1990; Martin & Tsuya, 1991). For all of these reasons, there is a pressing need for comparable data to be generated in both countries on an ongoing basis, but the need is especially great in Japan, where by many accounts the pace of social change in recent decades has been more rapid than in the United States.

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