

The Moderating Influence of Service Use on Negative Caregiving Consequences

David M. Bass,¹ Linda S. Noelker,¹ and Linda R. Rechlin²

¹Margaret Blenkner Research Center, The Benjamin Rose Institute, Cleveland, Ohio.

²Alzheimer Center, University Hospitals of Cleveland and Case Western Reserve University.

This investigation adapts the social support conceptual framework to examine the moderating influence of community service use by impaired older persons on the negative consequences of caregiving for informal helpers. The model is modified by defining services as a type of social support that can counteract the stress associated with various care recipient impairments. Results from multivariate analyses of data from 401 caregivers suggest that certain services for care recipients can reduce the adverse effects of certain impairments on informal caregivers. The use of health care service by care recipients who are more disabled is related to lower levels of caregiver depression, health deterioration, and social isolation. Personal care service use consistently offsets the negative effects of care recipients' behavioral problems. Additionally, the use of household service when care recipients exhibit behavioral problems is associated with lower levels of caregiver depression.

THIS research adapts the social support conceptual framework to examine the moderating effect of community services for elderly care recipients on negative caregiving consequences for informal helpers. Community services refer to in- and out-of-home assistance to care recipients from formal providers such as registered nurses, social workers, therapists in adult day care centers, home health aides, homemakers, and privately hired assistants. Existing research primarily examines the effects of community services on outcomes for care recipients, since they are the focus of these interventions. Less frequently investigated is whether community services for care recipients also affect outcomes for informal caregivers by providing respite or instrumental and emotional support (Weissert, Cready, and Pawelak, 1988).

The lack of research on whether care recipient service use impacts caregivers results, in part, from the absence of a conceptual framework for generating hypotheses, for guiding definitions and measures of service use, and for delineating models to test the effects of services (Wolinsky, 1994). The social support framework that has evolved over the past three decades is well-suited to fill this conceptual void, even though it seldom includes informal services as a component of social support (Adelman, Parks, and Albrecht, 1987; Jung, 1984; Krause, 1990). The social support framework primarily describes how informal social relationships with family members and friends moderate, buffer, or protect the individual from adverse consequences of negative events or stressors (House, Landis, and Umberson, 1988). Assistance from immediate kin is emphasized, with some studies using measures such as marital status, number of children, or number in the household, that completely omit formal helpers (Lin, 1986a). As Krause (1990) points out, failure to include formal services in models of social support attenuates the full effects that assistance from others may have on adjusting to negative life events.

The appropriateness of the social support framework for

studying the effects of formal service use is evidenced by the similar functions of formal service and informal support. For example, both formal and informal supports can provide concrete or instrumental aid, assist in evaluating problems, help in formulating and implementing a plan of action, give feedback on how problems are dealt with, and affirm a person's capacity to deal with the situation (Caplan, 1981).

In terms of caregiving for aged persons, the provision of instrumental aid is most common from both sources of support, with formal helpers often supplementing families' efforts with routine, ongoing care, while exclusively assisting with certain skilled care tasks (Litwak, 1985; Noelker and Bass, 1994). Formal sources of support also can provide emotional or expressive assistance to care recipients and caregivers by validating caregiving efforts, reinforcing confidence in caregiving abilities, serving as a source for venting frustrations, giving information that helps those involved to better understand difficulties, and helping with decision making (Lin, 1986a). Formal service providers also can advocate for changes when less than adequate care is being given and when alternative care arrangements, such as nursing home placement, are deemed appropriate (Frankfather, Smith, and Caro, 1981).

There are various ways that the instrumental and expressive functions of formal support could offset the physical, psychological, and social distress of caregiving for informal helpers. For example, formal assistance for physically disabled care recipients with personal care tasks that involve lifting or help with mobility (e.g., bathing) can reduce caregivers' risk of injury. This is especially germane for older caregivers who may have limited strength or health problems. Caregiver emotional distress may be reduced when services are used to monitor care and provide reassurance that adequate care is being given. Emotional distress also may be less when formal providers instruct caregivers in techniques for efficiently completing tasks. Skilled care tasks (e.g., wound care or giving injections) may be com-

pletely delegated to formal providers, thereby relieving caregivers' feelings of uncertainty or discomfort. Community services may be especially important for reducing the isolation and emotional upset that can result from caring for a mentally impaired care recipient. Care recipients' need for constant supervision may accentuate caregivers' need for respite and help in maintaining other roles and relationships.

Prior Studies

One meta-analysis of more than 150 experimental investigations of community services finds only eight studies that include some type of outcome for informal caregivers (Weissert, Cready, and Pawelak, 1988). Of these eight studies, several are over 20 years old and do not benefit from the past two decades of family caregiving research (Blenkner, Bloom, and Nielsen, 1971; Blenkner et al., 1970).

The Channeling Demonstration is the most extensive investigation that measures the effects of community service use by older persons on informal caregivers. Its results show that caregivers benefit from care recipient community service use in terms of higher life satisfaction, less restricted social activities, and greater satisfaction with care arrangements; however, caregivers' emotional strain, physical health deterioration, and financial strain are not correlated with service use (Stephens and Christianson, 1986). More typical than results from the Channeling Demonstration are findings from smaller studies that show care recipient service use predicts only small, nonsignificant reductions in negative consequences for informal helpers (Weissert, Cready, and Pawelak, 1988). An example is Oktay and Volland's (1990) study, which finds only nonsignificant reductions in caregiver health deterioration and social functioning from a coordinated post-hospital home care program.

The few survey investigations that test the relationship between care recipients' use of community services and caregiving consequences have mixed results. The National Long-Term Care Survey suggests that elderly persons' use of paid help predicts heightened levels of stress among employed caregivers (Orodenker, 1990). This is attributed to inconveniences in finding, using, and monitoring services, or to an incongruence between the goals of services and the goals of family members (Hasselkus, 1988).

Another survey finds that the effects of community services on caregivers vary by the type of caregiving consequence considered (Stoller and Pugliesi, 1989). Negative consequences specific to the demands of caregiving increase, while levels of general stress decrease. The authors conclude that community services relieve stress associated with caregiving demands that exceed the capacity of the informal network (Stoller and Pugliesi, 1989).

Conceptualizing Service Use as Social Support

Figure 1 presents one of several empirical models that can be derived from the social support framework and adapted to the study of care recipient impairment, community service use, and negative caregiving consequences. This model illustrates four principles outlined in the social support literature that are useful for developing this research.

The first principle states that stressors, social support, and distress occur in clusters rather than as single discrete events

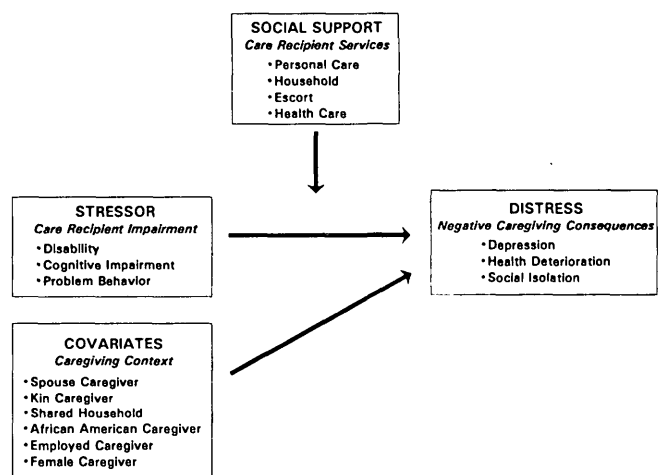


Figure 1. Empirical model of the moderating buffering effect.

(Pearlin, 1989). Clusters comprise a primary stressor, one or more secondary stressors that are byproducts of the primary stressor, support or coping resources used to deal with primary and/or secondary stressors, and the effects or outcomes of the stressors. For this study, the primary stressor within the caregiving context is the impairment of the care recipient. The negative caregiving consequences for informal helpers are outcomes, or distress, caused by the impairment. Care recipient services are a type of social support which, by responding to the primary stressor, may indirectly benefit caregivers, along with care recipients who are the main target of interventions (Sankar, 1991). In Figure 1, this means that community services for one person, namely the care recipient, can influence the negative consequences (i.e., distress) for another person, namely the caregiver.

The second principle describes the way that social support can influence distress. Although there are various possible interrelationships (see Lin, 1986b, for a review), the moderating stress buffering model is used in this study. The moderating model has been the focus of an extensive amount of research, but has not previously been used to estimate the effects of community services on informal caregivers. This model hypothesizes that at higher levels of care recipient impairment, the positive relationship between impairment (i.e., stressor) and negative caregiving consequences (i.e., distress) will be reduced when more care recipient services (i.e., social support) are used. This is illustrated in Figure 1 by the path from care recipient services that intersects the path between care recipient impairment and negative caregiving consequences. The moderating model is represented by a statistical interaction between the stressor and support (Finney et al., 1984; Southwood, 1978).

The third principle is that social support has various dimensions, with each dimension potentially having varying effects (House, 1981; Wilcox and Vernberg, 1985). Two commonly defined dimensions are instrumental vs expressive, and perceived vs received support (Lin, 1986a). More detailed classifications delineate many other types, such as esteem, appraisal, informational, and material (Cobb, 1976; Gottlieb, 1978; House, 1981). A recent caregiving investigation illustrates this principle by showing that different types of informal help to primary caregivers have varying

effects on caregiver well-being (Thompson et al., 1993). A corresponding argument is made in the literature on formal services which calls for measures that differentiate among the types of services (Bass, Looman, and Ehrlich, 1992; Bass and Noelker, 1987). The four types of community services representing social support in this study are personal care, household, escort, and health care (Figure 1).

The fourth principle is that for support to be effective, it must match the needs generated by a stressor (Krause, 1990; Vaux, 1988). When there is an incongruence between the stressor and the support, it is less likely that negative consequences (i.e., distress) will be counteracted. This principle implies that certain community services (i.e., support) will be more effective than others for offsetting the negative consequences of care recipient impairment (i.e., stressor). Moreover, services may differ in their capacity to offset one or other of the multiple dimensions of impairment (physical disability, cognitive impairment, and problem behavior).

Figure 1 has two additional features not directly derived from the social support conceptual framework. First, it includes six covariates shown in prior research to structure the caregiving context. One covariate distinguishes spouses from other informal helpers because husband and wife caregivers tend to be older, in poorer health, more committed to home care, and to experience more negative caregiving consequences (Cicirelli, 1983; Pruchno, Michaels, and Potashnik, 1990). The second covariate contrasts kin caregivers with friends and neighbors, because it has been shown that family members are more susceptible to negative caregiving consequences and tend to be more involved with daily care (Allan, 1986). The third covariate distinguishes caregivers who share a household with care recipients, since living arrangement, even more than type of relationship, may be the most powerful factor in structuring care situations (Deimling et al., 1989; Tennstedt, Crawford, and McKinlay, 1993). Race is the fourth covariate and controls for differences between White and African American caregivers (Miller, McFall, and Campbell, 1994).

Caregiver employment, the fifth covariate, has only recently received empirical attention, with current findings being mixed and somewhat contradictory. Some investigations show employed caregivers have more difficulty with competing role demands, use more services, and experience more negative caregiving consequences (Neal et al., 1993; Orodenker, 1990). Other studies, however, suggest that employed caregivers experience less adverse effects because of the benefits of maintaining multiple roles (Thoits, 1983). The work role also reduces isolation, provides time away from caregiving, facilitates access to information about more effective caregiving, and legitimates the use of, and reduces barriers to, formal services (Archbold, 1983; Scharlach, 1994).

Gender, the sixth covariate, distinguishes females who most often fill the caregiver role. Women caregivers provide more hands-on assistance, more often help with onerous and personal care tasks, are less likely to use formal services, and experience more negative caregiving consequences (Brody et al., 1992; Miller and Cafasso, 1992; Noelker and Bass, 1989; Pearlin et al., 1990).

Although these covariates are the most common contex-

tual factors, a variety of other characteristics, not included, could be linked to negative caregiving consequences, such as income and education level. There also may be complex indirect effects or two-way interactions that are not included. For example, if patterns of service use differ among employed, married adult-child, and spouse caregivers, then the capacity of services to moderate the effects of impairment could differ among these groups.

A second feature to note in Figure 1 is that contemporaneous measures of all constructs are used to estimate the model. This is an important limitation because an optimum test would use panel data with prospective information on the timing of changes in impairment, service use, and negative caregiving consequences. Interpretations of cross-sectional data used here are based on hypotheses specified in the conceptual model.

METHOD

Sample

Data come from in-person interviews with 401 primary informal caregivers whose elderly care recipients are clients of nonprofit case management agencies. The case management agencies are the five major not-for-profit organizations in Cuyahoga County, Ohio. One agency is a large nonsectarian organization that offers a broad range of health and social services to elderly persons and is funded by a variety of sources, including Medicare, Medicaid, the County Mental Health Board, and the agency's charitable endowment. Another organization is the public agency that administers the statewide Medicaid waiver program; while providing only case management, it contracts with other organizations for a full range of community services. Two of the study sites have religious sponsorship and provide services to persons of all ages, while the fifth organization is the home-care agency for the county's public hospital system.

Caregivers of elderly persons who receive case management service are selected for the study sample because of the case management practice principle that encourages the use of formal and informal resources (Gwyther, Gold, and Hinman-Smith, 1988; Schneider, 1988). This principle increases the likelihood that community services are used and facilitates the overall objective of examining the interface of formal and informal helpers. A drawback of the sample is that it overrepresents those with more severe impairments, more informal helpers, and connections to the formal service system.

Caregivers eligible for the study have care recipients who are 65 years of age or older, live outside of an institutional setting, and have been receiving case management services for at least one month prior to the study. The designation of "primary" caregiver comes from the elderly care recipient, or, if too impaired, the case manager. Caregivers include family members or friends who are not hired to assist care recipients and who have been assisting on a weekly or daily basis with at least one personal care task (i.e., bathing, dressing, toileting, grooming, and eating), or selected daily living task (i.e., light housekeeping, laundry, and shopping). The 401 caregivers represent 58.7 percent of those eligible to participate. Participation by caregivers was con-

tingent on participation by care recipients or, if too impaired, their collateral. The major reasons for nonparticipation, in the order of frequency, were: care recipient's refusal, caregiver's refusal, care recipient's unwillingness to give the name of their caregiver, and an inability to locate the caregiver.

Care recipients have an average age of 79.1 years; 79.6 percent ($n = 319$) are female, 56.9 percent ($n = 228$) are widowed, 59.1 percent ($n = 237$) are African American, and 56.9 percent ($n = 228$) share a household with the caregiver; 18.7 percent ($n = 75$) have a spouse caregiver, 44.9 percent ($n = 180$) have an adult child caregiver, 23.7 percent ($n = 95$) have a caregiver who is another type of relative, and 12.7 percent ($n = 51$) have a caregiver who is a friend.

Among caregivers, 58.6 years is the average age; 75.6 percent ($n = 303$) are female; 34.7 percent ($n = 139$) are high school graduates, with an additional 36.9 percent ($n = 148$) having at least some college; and 37.4 percent ($n = 150$) are employed.

Compared to national samples from the Channeling Demonstration (Stephens and Christianson, 1986) and the National Long-Term Care Survey (Stone, Cafferata, and Sangl, 1987), care recipients in this study are similar in age and gender, but include more who are widowed and more African Americans. Caregivers are similar to the national samples in age, percentage living with care recipients, employment status, and relationship to care recipients. However, caregivers in this research are more likely to be African American, are less likely to be married, and have higher levels of education (Stephens and Christianson, 1986; Stone, Cafferata, and Sangl, 1987).

Measures

Stressor: care recipient impairment. — The three measures of care recipient impairment are multi-item indicators that represent physical disability, cognitive impairment, and problem behavior. In the original questionnaire, items comprising these indices are part of an inventory of 38 mental and physical health symptoms derived from previous Margaret Blenkner Research Center (MBRC) studies and from other published research.

Physical disability is measured by the Nagi index (1976), a 7-item scale which assesses the amount of difficulty care recipients have with activities such as standing for long periods, stooping or bending, reaching, walking, and going up and down stairs. In an exploratory factor analysis of all mental and physical health symptoms, these items form a unique factor with loadings from .78 to .49, and have a Cronbach's alpha of .88.

Six items represent cognitive impairment and reflect the frequency with which care recipients repeat things, hear or see things, talk to themselves, forget names, forget words, and get confused. These items are adapted from two previously published cognitive impairment indices (Deimling and Bass, 1986; Golden, Teresi, and Gurland, 1984). Exploratory factor analysis of the various mental and physical symptoms confirms the unidimensionality of the cognitive

factor with loadings ranging from .74 to .48, and a Cronbach's alpha of .86.

The six items representing problem behavior are adapted from previously published research (Deimling and Bass, 1986; Noelker and Wallace, 1985) and measure the frequency with which the care recipient offers unwanted advice, complains or criticizes, yells or swears, exhibits sexually inappropriate behavior, is fearful without reason, and acts agitated or restless. These items factor separately, with loadings that range from .68 to .39, and a Cronbach's alpha of .85.

Social support: care recipient services. — A strength of this research is its ability to provide detailed information about elderly care recipients' use of different types of community services. The specific methodology for gathering service information is described elsewhere (Noelker and Bass, 1994) and involves asking informal caregivers about help given to care recipients with 43 specific tasks from three sources: primary caregivers, other informal helpers, and formal helpers. This analysis focuses on assistance from formal sources (e.g., a professional, hired helper, or agency worker) during the 4 weeks prior to the interview. A 4-week time period is selected to enhance the caregiver-respondent's ability to recall specific details about service use (George, 1989).

Predetermined conceptual groupings of tasks are supported by results of factor and reliability analyses, and are used to represent four distinct services. The first type, personal care service, is composed of formal help with one or more of the following five tasks: eating, toileting, dressing, supervision of daily activities, and supervision because the care recipient could not be left alone. Factor loadings range from .77 to .52, with a Cronbach's alpha of .78. This measure, as well as the three other service indices, is considered to be a measure of service volume denoting the number of tasks with which formal help is given.

The second type, household service, includes assistance with meal preparation, light housekeeping, heavy housecleaning, and laundry. These four tasks form a separate factor and have loadings that range from .80 to .44, with a Cronbach's alpha of .70.

The third type of service, escort, is composed of formal assistance with accompanying care recipients to appointments, providing transportation, and shopping. These three items form a separate factor, with loadings from .82 to .44, and a Cronbach's alpha of .62.

The fourth service type, health care, is composed of formal help with five tasks: getting medications and medical supplies, catheter or colostomy care, monitoring vital signs, giving injections or intravenous treatments, and assisting with rehabilitative exercises. Unlike indices for the other services, these tasks do not have their highest loadings on the same factor, although all load positively on a single factor. These tasks also form a less reliable indicator, as evidenced by a Cronbach's alpha of .51. The lower reliability and variability in factor loadings may partially be a statistical artifact resulting from dissimilar distributions on the various health care tasks. For example, specialized care, such as intravenous treatments and care for catheters, is uncommon

in a community sample of elderly persons compared to assistance with monitoring vital signs and getting medications. Large differences in distributions across the five health care tasks reduce their intercorrelations, even though they represent a distinct service.

Distress: negative caregiving consequences. — The study's dependent variables include three conceptually and empirically different measures of negative caregiving consequences for primary informal caregivers: depression, physical health deterioration, and social isolation. As in prior MBRC research (Bass et al., 1994; Deimling and Bass, 1986), caregiving consequences are viewed as multidimensional and include indicators of general well-being and caregiving-specific effects. Exploratory factor analysis of all items that make up the three negative caregiving consequences selected for this analysis, as well as of other items representing types of negative and positive caregiving effects, confirms this multidimensional approach. The factor analysis yields separate orthogonal factors for items measuring depression, health deterioration, and social isolation, and is consistent with the use of these items in previous research.

Depression, the first measure of negative caregiving consequences, is assessed by the Center for Epidemiological Study's Depression Scale (CES-D) (Radloff, 1977). Although referred to as a negative caregiving consequence, this is a general well-being indicator that is not specifically linked to caregiving. The inclusion of this type of general measure, along with other caregiving-specific indicators, follows the recommended approach in recent articles and enables the study to examine diverse facets of negative caregiving consequences (George, 1994; Stull, Koslowski, and Kercher, 1994). The 20-item CES-D is administered in the first part of the interview, prior to questions about caregiving, and has a Cronbach's alpha of .89.

The second negative caregiving consequence, physical health deterioration, elicits caregivers' perceptions about whether caregiving causes them to be sick more often, have more aches and pains, feel physically worse, be more nervous, and have less energy. Responses for these items are in four categories, ranging from "strongly agree" to "strongly disagree." The five items factor separately from other caregiving consequences, with loadings from .78 to .61, and a Cronbach's alpha of .89.

The third negative caregiving consequence assesses social isolation (Bass et al., 1994). It is composed of five items that measure, because of caregiving, whether caregivers participated "more often," "the same," or "less often" in various social activities which include religious activities, visiting with family and friends, participating in organizations or groups, volunteering, and attending entertainment activities. The five items form a separate factor, with loadings from .80 to .71, and a Cronbach's alpha of .85.

The three measures of negative caregiving consequences are positively related to one another, as expected, given their common conceptualization as measures of distress. The highest intercorrelation among the three measures is .52 for depression and health deterioration, and the lowest is .22 for depression and social isolation.

Analysis

Ordinary least squares regression is used to examine the moderating effect of services. Product terms, created by multiplying scores for impairment by scores for each service, are entered as the final step of each regression equation. When simultaneously entered with all other variables, statistically significant product terms with negative values indicate that service use reduces the relationship between impairment and negative caregiving consequences (Cleary and Kessler, 1982; Southwood, 1978).

In order to interpret product terms, interacting variables must have meaningful zero points. A common method for defining a zero point when dealing with ordinal or interval level variables is to center their means to zero. This creates deviation scores and allows a variable's effect to be interpreted in relation to an average score for that variable (Finney et al., 1984). Since the centering procedure is used with the three measures of care recipient impairment (disability, cognitive impairment, and problem behavior), a value of zero for these variables indicates an average level. The service variables, however, are retained in their original form because a score of zero means that no service is used, while nonzero values reflect the number of tasks with which formal providers assist.

RESULTS

Table 1 presents the means, standard deviations, and scoring for all variables except the product terms which are constructed from the impairment and service variables; the uncentered versions of the impairment measures are displayed.

The first symptom of care recipient impairment, disability, has a mean of 12.39, indicating that, on average, care recipients have "some difficulty" with each item in the

Table 1. Means, Standard Deviations, and Scoring for All Variables in the Study of the Moderating Influence of Service Use on Negative Caregiving Consequences ($N = 401$)

Variables and Scoring	Mean	SD
Covariates: Caregiving Context		
Spouse caregiver (1 = yes)	.19	.39
Kin caregiver (1 = yes)	.87	.34
Shared household (1 = yes)	.56	.50
African American caregiver (1 = yes)	.59	.49
Employed caregiver (1 = yes)	.37	.48
Female caregiver (1 = yes)	.76	.43
Stressor: Care Recipient Impairment		
Physical disability (0–21 [high])	12.39	5.36
Cognitive impairment (0–18 [high])	5.59	4.94
Problem behavior (0–18 [high])	4.27	4.04
Social Support: Care Recipient Services		
Personal care (0–5)	1.50	1.63
Household (0–4)	1.84	1.40
Escort (0–3)	.62	.91
Health care (0–5)	1.25	1.07
Distress: Negative Caregiving Consequences		
Depression (0–60 [high])	10.37	9.36
Health deterioration (0–15 [high])	5.69	2.76
Social isolation (0–10 [high])	6.69	2.17

index. Only 3.7 percent ($n = 15$) of care recipients have “no difficulty” with all seven activities in the index, which is expected, given that the sample was restricted to persons receiving assistance with daily tasks. Disability is more normally distributed (skewness = $-.53$) than the other impairment measures, although the sample is much more impaired than the general population (Nagi, 1976). Cognitive impairment has a mean of 5.59 and is skewed toward lower levels (skewness = $.844$). Compared to disability, a larger number of care recipients (15.2%; $n = 61$) has none of the six symptoms of cognitive impairment. This distribution is similar to results in prior studies (Bass et al., 1994). The 6-item problem behavior index has a mean of 4.27, and is the least frequently reported impairment. As in prior research (Bass et al., 1994), its distribution is skewed toward low values (skewness = 1.37).

In terms of the service variables, the average care recipient gets formal help with 1.50 personal care tasks, with 59.4 percent receiving some personal care service. Household service is the most commonly used, with an average of 1.84 tasks, and 75.1 percent of care recipients getting some formal help. Escort service is least likely to be used, with a mean of .62 tasks, and only 39.1 percent using some amount of this service. Health care service is used by 74.6 percent of the sample and has a mean of 1.25 tasks.

Depression, the first of the negative caregiving consequences, has a mean of 10.37 and a distribution weighted toward low levels (skewness = 1.22). Approximately 23 percent of caregivers have scores above 16, which is a score commonly used to indicate a high risk of clinical depression. The percentage above 16 is similar to results in larger community samples (Radloff, 1977). Physical health deterioration has a fairly normal distribution. The mean of 5.69 suggests that caregivers in this study tend to report more negative health consequences from caregiving than those in a previous study that used a similar measure (Bass, Tausig, and Noelker, 1988/89). Social isolation also has a fairly normal distribution (skewness = $.22$), with a mean of 6.69 in a 0-to-10 range. Because the scoring for the items in this index diverges from prior MBRC studies, it is difficult to compare this study sample.

Results of the multivariate analysis are in Table 2, which presents one equation for each negative caregiving consequence. The equations are organized according to the four categories of predictors: covariates, impairment (stressor), care recipient services (social support), and product terms (stressor \times social support). The R^2 change values in Table 2 show the proportion of explained variance contributed by each category of predictors as it is hierarchically entered into the model, with product terms being entered on the last step. The unstandardized b and standardized (Beta) regression coefficients are for the full equation, which includes all variables simultaneously entered.

The R^2 change values for the product terms are one way to evaluate whether there is an interaction between impairment and services (McClendon, 1994). These values suggest that the product terms add significantly to the explained variance in caregiver depression (6%) and health deterioration (5%). In the third equation for social isolation, the R^2 change for the product terms is not significant. For this analysis, an

evaluation of the interaction on the basis of the R^2 change values is somewhat limited because it does not distinguish the direction of the product terms, which is integral to a test of the moderating model.

A more precise test of the moderating hypothesis is obtained by examining the individual unstandardized regression coefficients for the product terms. A moderating effect occurs when product terms are significant and have negative values, indicating that the effect of an impairment on a negative caregiving consequence is *reduced* when more services are used.

There are six significant individual product terms in Table 2 for caregiver depression: two for disability, one for cognitive impairment, and three for problem behavior. Four of these have negative values, indicating the expected moderating effect (disability \times health care [$-.16$]; cognitive impairment \times health care [$-.26$]; problem behavior \times personal care [$-.20$]; and problem behavior \times household [$-.22$]). The other two significant product terms have positive values, suggesting an interaction that is opposite the moderating effect (disability \times household [$.17$] and problem behavior \times health care [$.32$]). These two positive coefficients suggest that the effect of an impairment on a negative caregiving consequence increases as more service is used.

For health deterioration, the second negative caregiving consequence in Table 2, there are two significant, negative product terms (disability \times health care [$-.08$] and problem behavior \times personal care [$-.05$]). Similarly, the equation for social isolation has the same two significant product terms in the negative direction (disability \times health care [$.03$] and problem behavior \times personal care [$-.04$]). The interaction for disability \times personal care also is significant in the equation for social isolation, but its effect is positive and opposite the moderating hypothesis ($.02$).

As noted in the table, two interactions in the equation for social isolation and one for depression are significant at less than the .10 probability level, rather than the traditional .05 critical level. These slightly larger probabilities reflect effects that are less strong, but still worthy of attention: especially the one involving disability \times health care, which is consistent across dependent variables.

Overall, the three equations include eight significant negative interactions that are consistent with the moderating model and overshadow the three significant positive interactions that contradict the model.

Two product terms (disability \times health care; and problem behavior \times personal care) are significant and in a negative direction for all three negative caregiving consequences. Thus, health care and personal care services appear to be particularly robust in offsetting the negative impact that disability and problem behavior of care recipients have on caregivers.

Escort service has no significant moderating effect on the relationship between any symptoms of care recipient impairment and these negative caregiving consequences. Household service has only a limited ability to offset the effects of impairment, as indicated by its one significant interaction consistent with the moderating model with problem behavior in the equation for caregiver depression. There also is only one significant interaction involving symptoms of cognitive

Table 2. Unstandardized (*b*) and Standardized (Beta) Regression Coefficients for the Relationship of Independent Variables and Interactions With Negative Caregiving Consequences (*N* = 401)

Variables	Caregiver Depression		Health Deterioration		Social Isolation	
	<i>b</i>	Beta	<i>b</i>	Beta	<i>b</i>	Beta
Covariates						
Spouse caregiver	1.37	.06	.45	.07	.92**	.17
Kin caregiver	4.04**	.15	1.24**	.15	.82**	.13
Shared household	-.08	-.004	.33	.06	.70**	.16
African American caregiver	-1.35	-.07	-.34	-.06	.45*	.10
Employed caregiver	-1.86*	-.10	-.81**	-.14	-.50**	-.11
Female caregiver	1.13	.05	.70*	.11	.34	.07
<i>R</i> ² change	.08**		.14**		.27**	
Stressor: Care Recipient Impairment*						
Physical disability	-.02	-.01	.12**	.23	.01	.02
Cognitive impairment	.30	.16	.05	.08	.11*	.24
Problem behavior	.61*	.26	.20**	.29	.01	.02
<i>R</i> ² change	.05**		.08**		.03**	
Social Support: Care Recipient Services						
Personal care	-.17	-.03	-.08	-.05	.28**	.21
Household	-.78*	-.12	-.09	-.04	-.19**	-.12
Escort	.10	.01	.20	.07	.05	.02
Health care	-.06	-.01	.05	.02	-.15	-.07
<i>R</i> ² change	.02+		.01		.04**	
Interactions With Physical Disability						
Personal care	-.02	-.02	-.001	-.004	.02+	.12
Household	.17**	.20	.01	.05	-.002	-.01
Escort	.08	.04	.01	.02	.01	.04
Health care	-.16*	-.16	-.08**	-.26	-.03+	-.11
Interactions With Cognitive Impairment						
Personal care	.10	.14	.01	.05	.02	.13
Household	.02	.02	.02	.07	-.01	-.06
Escort	.20	.13	.003	.008	-.02	-.07
Health care	-.26*	-.26	.01	.03	-.04	-.16
Interactions With Problem Behavior						
Personal care	-.20*	-.23	-.05*	-.18	-.04*	-.18
Household	-.22+	-.19	.01	.03	.003	.01
Escort	-.004	-.002	.02	.03	.02	.03
Health care	.32*	.26	-.02	-.05	.03	.11
<i>R</i> ² change	.06**		.05**		.02	
Total <i>R</i> ²	.21**		.27**		.36**	

*The means for these impairment variables are centered to zero in order to facilitate the interpretation of product terms.
 + *p* < .10; **p* ≤ .05, ***p* ≤ .01.

impairment, suggesting that the adverse effects of these symptoms on caregivers are less likely to be affected by service use.

Table 3 illustrates the nature of the interactions for the eight product terms that are consistent with the moderating model and shows that the relationship between an impairment and a negative caregiving consequence is reduced when more task assistance is used. The amount of the decline for a given interaction is equal to the unstandardized regression coefficient for a product term in Table 2. The coefficients in Table 3 are calculated by summing the unstandardized regression coefficient for a main effect and the coefficient for a product term, and then multiplying that value by different numbers of tasks (see McClendon, 1994, pp. 275–276; or Cohen and Cohen, 1975, pp. 304–308, for

a discussion of these calculations). In estimating these coefficients, only three health care tasks and four personal care and household tasks are included, since few care recipients used more than these amounts of service. The smallest number of clients for which an estimate is calculated is 38, which corresponds to four personal care tasks.

One of the strongest examples of the moderating pattern is the interaction of problem behavior and personal care service for caregiver depression (row three in Table 3). This provides a good illustration of the hypothesized effect because the relationship changes considerably as more tasks are used, and, as described below, the pattern can be observed in the mean depression scores even when other covariates are not controlled. The first coefficient is .61, which is equal to the effect of problem behavior when no service is used and

Table 3. The Varying Effects of Types of Care Recipient Impairment on Negative Caregiving Consequences When Different Amounts of Services are Used

Significant Interactions Consistent With the Moderating Model	No Service Use	Assistance With One Task	Assistance With Two Tasks	Assistance With Three Tasks	Assistance With Four Tasks
Caregiver Depression					
Physical disability × health care	-.02	-.18	-.34	-.50	—
Cognitive impairment × health care	.30	.04	-.22	-.48	—
Problem behavior × personal care	.61	.41	.21	.01	-.19
Problem behavior × household	.61	.39	.17	-.05	-.27
Health Deterioration					
Physical disability × health care	.12	.04	-.04	-.12	—
Problem behavior × personal care	.20	.15	.10	.05	.00
Social Isolation					
Physical disability × health care	.01	-.02	-.05	-.08	—
Problem behavior × personal care	.01	-.03	-.07	-.11	-.15

shows that a one-unit increase in problem behavior predicts a .61 increase in caregiver depression. Assuming a linear pattern, each added task of personal care service reduces this relationship by .20 (i.e., the absolute value of the unstandardized regression coefficient for the problem behavior × personal care product term in Table 2). Thus, the relationship between problem behavior and depression declines to .41 when service providers help with one personal care task, to .21 when assistance with two personal care tasks is given, and to virtually zero (.01) when services assist with three personal care tasks. Consequently, the adverse effects of problem behavior on caregiver depression are moderated, or, in this case, nullified by personal care services.

As a further illustration, the mean scores for depression were calculated using dichotomous versions of problem behavior and personal care service. When care recipients used no personal care service and exhibited no problem behavior, the mean caregiver depression score was 7.38. The mean caregiver depression score increased to 16.71 when some degree of problem behavior was evident and no personal care service was used. This is a 9.33 point increase, with the resulting mean being above the common cutting point of 16, used to indicate high risk of clinical depression (Radloff, 1977). In contrast, for care recipients who used personal care service, the mean caregiver depression score was 9.47 when no problem behavior occurred, and increased only to 11.63 when there was some degree of problem behavior. This is an increase of only 2.16 points, with the resulting mean well below the high-risk cutting point of 16.

Coefficients for the other interactions in Table 3 follow similar patterns. All but one product term have a positive association when no service is used, indicating that greater impairment predicts more negative caregiving consequences. As more service is used, the values of the coefficients are reduced to approximately zero, indicating that care recipient impairment has no relationship to negative caregiving consequences.

In addition to the effects of impairment and services, results of the analysis highlight the importance of the six covariate measures of the caregiving context included as controls. In Table 2, R^2 change values for the six covariates

show that they account for the largest portions of explained variance in each negative caregiving consequence (R^2 change equals 8% for caregiver depression, 14% for health deterioration, and 27% for social isolation). The individual regression coefficients show that kin caregivers consistently report more negative caregiving consequences, while employed caregivers consistently report less adverse effects. Additionally, spouses, those sharing a household with care recipients, and African Americans report more social isolation because of caregiving.

DISCUSSION

The moderating buffering model is widely researched as one way that informal social support can counteract the negative effects of a stressor (Cohen and Wills, 1985; Lin, 1986b; Wheaton, 1985). The moderating model posits that at higher levels of a stressor, the positive relationship between the stressor and distress is reduced by more social support. The moderating effect occurs when there is an interaction between the stressor and social support.

The moderating model as used in this investigation is modified in two important ways. First, the concept of social support is expanded to include community services. This contrasts with most social support research which gives little attention to the potential benefits of formal assistance (Adelman, Parks, and Albrecht, 1987; Jung, 1984; Krause, 1990).

The second modification is that support to one person in a stressful situation is hypothesized as beneficial to another person who is exposed to the same or a related stressor (Pearlin, 1989; Sankar, 1991). In this case, community services provided to directly assist the impaired care recipient have secondary benefits for the primary informal caregiver.

The application of the social support framework to the study of formal services has several advantages over other conceptual models, such as that developed by Andersen and Newman (1973), which essentially provide a schema for organizing predictive factors. Unlike these other models, the social support framework offers several hypotheses that describe the process by which services can modify a stressful situation (Lin, 1986a; Wheaton, 1985). The social support framework also can provide a more precise conceptualiza-

tion of service use by treating informal and formal assistance as parallel and by delineating the different dimensions of services such as structure, type, quantity, and quality. Additionally, the social support framework provides refined techniques for statistically testing and interpreting hypotheses, as illustrated by the interactive moderating model (Finney et al., 1984).

Differences in the effects of the four services investigated in this analysis illustrate the complexity and the importance of distinguishing among the various components of formal support. Specifically, health care service use has a consistent stress-moderating effect on physical disability for all three negative caregiving consequences. Health care service use also reduces the effect of symptoms of cognitive impairment on caregiver depression. Personal care service use consistently buffers the effect of problem behavior for all three negative caregiving consequences. Household and escort services do not have consistent moderating influences. Household service only moderates the negative effect of problem behavior on caregiver depression, while escort service use does not interact with any of the care recipient impairments and, thus, does not show any stress-buffering potential. Global or aggregated measures of community services that do not distinguish among service types, or unidimensional measures of impairment, would not have accurately represented these diverse findings.

One explanation for the consistent interaction of health care service use and disability is that physical impairments often require specialized care that is in the purview of formal helpers who have the required technical knowledge and experience (Litwak, 1985). This type of community-based care encompasses a variety of skilled tasks (e.g., assistance with medical equipment, monitoring vital signs, catheter and colostomy care, intravenous therapies, and rehabilitative exercises) that exceed the abilities of many informal caregivers. Our prior research supports this interpretation by showing that health care service tasks are the only area of care in which formal providers may exclusively substitute for informal caregivers (Noelker and Bass, 1989).

The consistent effect of health care service use also implies that involving formal providers in the care of disabled elderly persons can be particularly efficacious for caregivers. Moreover, care recipients with higher levels of disability who do not use community-health care services appear to have caregivers at greater risk of negative caregiving consequences.

Health care service's ability to counteract cognitive impairment's effect on caregiver depression can be explained in a similar manner. Symptoms of cognitive impairment often occur in association with physical health problems, such as a stroke or Parkinson's disease. If the etiology of these symptoms is a physical health problem, health-focused interventions, including assistance with skilled health care tasks, may be most beneficial to caregivers.

Personal care service consistently moderates the stressor-distress relationship between problem behavior and negative caregiving consequences. In contrast to skilled health care, personal care involves assistance with ongoing routine tasks (i.e., eating, toileting, dressing, and supervision). Problem behavior also is distinguished from other symptoms of im-

pairment by its consistent association with more negative caregiving consequences (Bass et al., 1994; Pruchno et al., 1990). These adverse effects are attributed to the deviant nature of the behavior; to ambiguity about whether it is a symptom of illness or an intentional act; and to greater difficulty assisting uncooperative, resistant, or abusive care recipients. Problem behavior also may weaken the informal support network by making family members and friends reluctant or uncomfortable about helping and by making primary caregivers less willing to involve others.

Personal care service may be an essential supplement for caregivers of behaviorally disruptive persons by providing them with temporary relief from daily care. Providers of personal care, such as home health aides, often become familiar with caregivers because of the number of hours they spend in the home. These formal providers may be an important source of information about the nature and cause of symptoms of problem behavior, as well as providing emotional support.

Similar to the effects of personal care service, household service use significantly moderates the relationship between problem behavior and caregiver depression. Household service typically involves a homemaker or privately hired worker coming to the home for several hours on a regular basis. Like personal care, this type of help may provide the caregiver with opportunities for respite, as well as emotional support and information.

Study results highlight the importance of home health aides, homemakers, and companions for enhancing the welfare of informal caregivers. Few empirical studies examine the role of these paraprofessionals, and future research should give greater attention to the nature and effects of relationships between these service providers and informal caregivers.

Although the predominant pattern evidenced by significant empirical results supports the moderating effect, three interactions are opposite from what was expected. These effects, however, are not consistent for any one care recipient impairment or service. One explanation for these unexpected findings is that certain services, in combination with certain impairments, may exacerbate the difficulties of caregiving because family members may (a) disagree with service providers about the kinds of help needed; (b) be dissatisfied with the quality of help; or (c) have problems finding, arranging, and monitoring services (Hasselkus, 1988; Morgan, 1989; Orodnenker, 1990).

An alternative explanation is that the increased use of particular services, for certain symptoms of impairment, is a response to higher levels of caregiver distress, rather than a cause of that distress. This implies that negative caregiving consequences, in the context of certain types of impairment, mobilize caregivers to request more services or to influence providers' judgments of the need for more assistance.

In summary, the social support framework is a useful tool for extending research on formal services. The current study, however, tests only one of several models for how services can benefit care recipients and caregivers. The efficacy of this approach can be assessed more fully by studies using prospective data that more precisely delineate

the timing of service use relative to the stressor and distress. In light of the complexity of this study's findings, subsequent research should also incorporate multidimensional measures of constructs. Especially important for advancing research on community services is the use of measures of formal support that reflect different types, amounts, and duration of service use.

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Address correspondence to Dr. David M. Bass, Margaret Blenkner Research Center, The Benjamin Rose Institute, The Citizens Building, 850 Euclid Avenue, Suite 1100, Cleveland, OH 44114-3304.

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