

Contributors to and Mediators of Psychological Well-Being for Informal Caregivers

Mary Ellen Yates, Sharon Tennstedt, and Bei-Hung Chang

¹New England Research Institutes, Watertown, Massachusetts.

This article explores the relationships between caregiving stressors and caregiver well-being in a representative community sample of disabled elders and their informal caregivers. The direct and indirect effects of stressors and potential mediators on the outcome of caregiver psychological well-being, as measured by depression, were examined using path analysis. Potential mediators of the primary stressors on depression included mastery, emotional support, quality of relationship between the caregiver and the care recipient, formal service use and role overload. Findings indicate that the caregiving stressors (needs for care) led to caregiver depression indirectly through their effect on hours of care provided and the resulting caregiver perception of role overload. Quality of the caregiver/care recipient relationship mediated the relationship of the caregiving stressors and caregiver overload and depression. Finally, regardless of the level of primary stressors, caregivers with high levels of mastery or emotional support were at lower risk of depression. These findings can be used to inform the design of proactive caregiver interventions.

PREVIOUS research has examined the psychological and physical outcomes associated with the stress and strains of caring, as well as coping strategies used by caregivers (Folkman & Lazarus, 1988; George, 1990; George & Gwyther, 1986; McFall & Miller, 1992; Miller et al., 1995; Zarit, 1989). Frequently based on stress theory (Lazarus, 1966; Lazarus, 1993; Pearlin et al., 1990), a major outcome or focus of this research has been caregiver well-being, measured by physical health (Cohen & Syme, 1985; Pruchno & Potashnik, 1989; Taylor, Ford, & Dunbar, 1995) and/or mental health (Gallagher et al., 1989; Pruchno & Potashnik, 1989; Pruchno & Resch, 1989; Tennstedt, Cafferata, & Sullivan, 1992; Thompson et al., 1993). Mental health outcomes have been reported as more likely to be affected by caregiver burden than are physical health or financial outcomes (George & Gwyther, 1986). A direct relationship between depressive symptoms and the extent of negative impacts of caregiving has been reported (Tennstedt, Cafferata, & Sullivan, 1992), even though the relationships between depressive symptoms, care recipient disability, and the type or amount of care have not been clearly identified (Kinney & Stephens, 1989; Poulshock & Deimling, 1984). This suggests that the relationship between depression and caregiving experiences may have less to do with caregiving stressors (the actual tasks or amount of care) and more to do with the perception or appraisal of these tasks by the caregiver and the meaning attached to the caregiving situations.

Caregiver perceptions or appraisals of the caregiving situations in relation to caregiver outcomes of burden and depression have been examined by other researchers (Abel, 1990; Braithwaite, 1992; Braithwaite, 1996a; Gallagher et al., 1989; Kasper, Steinbach, & Andrews, 1994; Pruchno & Potashnik, 1989; Pruchno & Resch, 1989; Raveis, Siegel, & Sudit, 1990). The caregiving appraisal model, as pro-

posed by Lawton and colleagues (1989, 1991), focuses on the relationships between the objective caregiving situation and the caregiver's constant appraisal and reappraisal of the situation. The results of this appraisal, in turn, are reflected in the expression of the total caregiving experience of the caregivers (Braithwaite, 1992; Braithwaite, 1996a; Lawton et al., 1989; Lawton et al., 1991).

In sum, research to date on caregiver well-being has been based on two conceptual models—stress and appraisal. The results of this research suggest advantages to investigating both the impact of stressors as well as the appraisal of these stressors on caregiver well-being.

CONCEPTUAL MODEL

The model proposed for this analysis draws upon both the stress model presented by Pearlin, Mullan, Semple, and Skaff (1990) and the appraisal model presented by Lawton, Kleban, Moss, Rovine, and Glicksman (1989) and Lawton, Moss, Kleban, Glicksman, and Rovine (1991). These two models view the various components of the caregiving process in a slightly different manner. The *caregiving stress model* is derived from work on the stress process, in which the relationships among many factors that lead to personal stress are evaluated in terms of how the relationships develop and change over time (Pearlin et al., 1990; Skaff, Pearlin, & Mullan, 1996). The basic stress model includes four major factors—stressors, mediators, outcomes, and contextual or background information. Important features of the caregiver stress model include the acknowledgment of multiple types of factors that can lead to caregiver difficulties, acknowledgment of individual differences, and the use of multiple indicators of adaptation (Gatz, Bengtson, & Blum, 1990). The *appraisal model* proposed by Lawton and colleagues (1989, 1991) groups subjective and interpretive variables together into the category of “appraisal,”

and adds this appraisal factor to the basic factors of the stress model. Lawton defines caregiving appraisal as “all cognitive and affectional appraisals and reappraisals of the potential stressor and the efficacy of one’s coping efforts” (1989, p. 61). The appraisal model provides clearer boundaries between the stages of the stress process which make the model more accurate temporally (Braithwaite, 1996b).

The caregiving stress model, while more prevalent in research and more varied in its application, has been criticized (Abel, 1990; Braithwaite, 1996a; Gatz, Bengtson, & Blum, 1990). First, the stress model focuses almost exclusively on the individual caregiver’s coping mechanisms. Second, positive outcomes have rarely been recognized and explored within the stress paradigm. And third, due to the fact that care recipient characteristics are often considered to be the stressors, the model loses sight of the dyadic relationship between the caregiver and recipient, as well as other family and intimate relationships. These relationships are multidimensional in nature and include current and past interactions which occur or occurred in a cultural and/or historical context.

The appraisal model, on the other hand, has attempted to understand this relational aspect. It views the “caregiving situation” as a process, one that is dynamic and involves caregivers, care receivers and other environmental and psychosocial factors. Since the appraisal model incorporates much of the stress model, it should not be seen as a completely distinctive model but, rather, considered in terms of what it adds to the stress model. However, this model has also been criticized, primarily because the components of appraisal overlap with components of resources and coping strategies (Braithwaite, 1996a; Gatz, Bengtson, & Blum, 1990).

The model used in this analysis builds on the strengths of both the stress and appraisal models by including aspects of each. Several modifications of Pearlin and associates’ (1990) model have been made to incorporate Lawton and colleagues’ (1989) concept of appraisal. First, the primary stressors in the proposed model consist of the level and type of disability, but do not include caregiving assistance

and associated overload, as in Pearlin and associates’ stress model (1990). Instead, caregiving assistance is considered here to be an appraisal. Presenting the model in this way distinguishes between the levels of care recipient disability (stressor) and the caregiver responses to the disability (appraisal). Because the caregiver must evaluate the extent of the disability and determine how much care is needed, caregiving assistance involves an understanding of the situation and a response by the caregiver. Thus, in this model, it is the subjective appraisal of the elder’s need for care rather than the elder’s actual disability which determines the amount of care which will be provided. This is based on findings that suggest that some caregivers provide different amounts of care for disabled individuals who have similar objective needs for assistance, as defined by the functional abilities of the elder (DeBettignies, Mahurin, & Pirozzolo, 1993). This assumption does not invalidate or change the hypothesis that increasing disability and cognitive impairments will require more caregiving assistance, only that the relationship between need and care is a function of the caregiver’s appraisal.

A second modification to the stress model considers “overload” as a secondary appraisal rather than as a primary stressor, as it is used by Pearlin and associates (1990). The caregivers, in determining their levels of overload, have assessed their own situations and determined how they feel about it. As such, overload can be compared to what others have called subjective burden, and can be defined as the feelings expressed by the caregiver in regards to energy level, satisfaction with the level of care provided, and having enough time to do everything necessary, including time for one’s self (Pearlin et al., 1990). To date, the primary and secondary appraisals have not been examined as part of the same model. This model links the primary appraisal, as well as the mediators, to the secondary appraisal process.

The model (Figure 1) links caregiving stressors, caregiving appraisals, and potential mediators to caregiver well-being. The primary elements of the model are: (a) the stress-

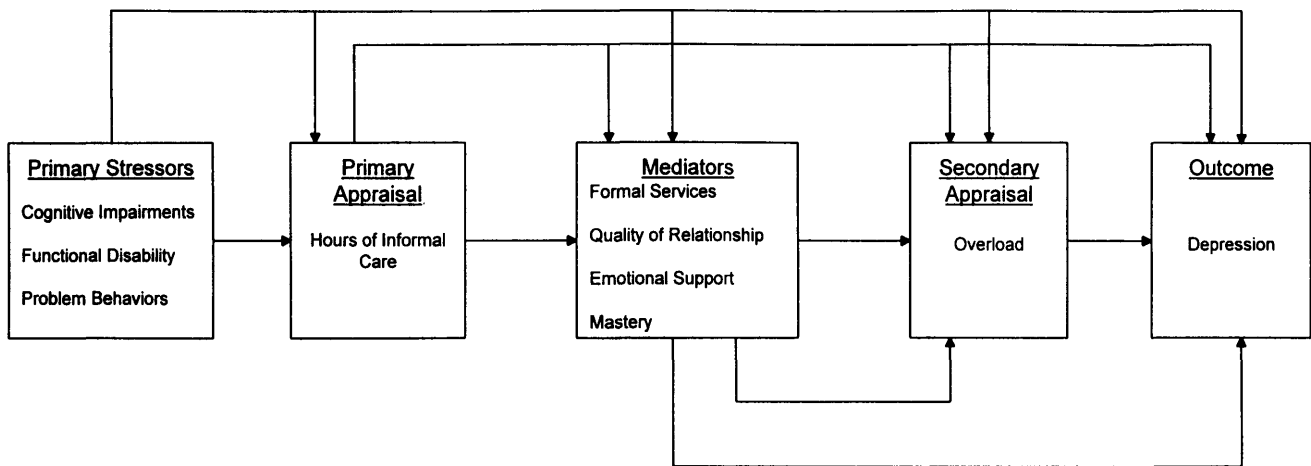


Figure 1. Conceptual model.

or variables of care recipient need for care; (b) caregiver appraisal (primary) of the need for care as measured by hours of informal care provided; (c) mediators, which potentially change the effect of the stressors (including the appraisals of the stressors) on caregiver psychological well-being; (d) caregiver appraisal (secondary) of the caregiving situation (overload); and (e) the outcome of caregiver psychological well-being, measured by risk of depression. The model proposes that the elder's needs for care lead to the number of care hours provided by the caregiver. In turn, the number of caregiving hours, along with contextual and intervening variables, lead to perceptions of burden, or caregiver overload. Finally, the model proposes that it is the caregiver's perception of overload that leads to caregiver depression.

The primary stressors consist of three separate measures of need for care: (a) level of functional disability; (b) presence of cognitive impairment; and (c) presence of problem behaviors. The relationship between these factors and caregiver depression has been investigated, but results are inconclusive. Some studies have found relationships between the care recipient's physical disabilities and caregiver depression, while others have found that only cognitive impairments are related to mental health outcomes for the caregiver (Pruchno, 1990; George & Gwyther, 1986). Consideration of the caregiver's appraisals of these needs for care is expected to better explain their relationship to caregiver well-being.

As previously described, this model proposes that there are two separate caregiver appraisals, which affect the relationship between the primary stressors and the outcome. The primary appraisal is hours of informal care provided, which represent both the caregiver's subjective appraisal of the needs of the care recipient, as well as a more objective measure of caregiving work. The secondary appraisal measures the caregiver's perception of being overwhelmed or overloaded by the daily caregiving experiences. This secondary appraisal is the one most closely related to the commonly used concept of burden, and can be considered the "burden" variable in this analysis.

In stress research, it has been shown that people exposed to apparently equivalent stressors are affected by them in different ways. The usual explanation provided for this outcome variability is that mediators or resources are used to alter the effect of the stressor (Pearlin et al., 1990). Mediators that have been examined in caregiver research include personal and social resources (Lawton et al., 1989; Lawton et al., 1991; Lazarus, 1966; Lazarus, 1993), levels of material or financial resources (Archbold, 1983), locus of control (Miller et al., 1995), and provision of formal services (Bass, Noelker, & Rechlin, 1996). Intervening and mediating variables in this model include the previously mentioned number of hours of informal care and caregiver overload (appraisals), as well as the caregiver's sense of mastery, emotional support available to the caregiver, quality of the relationship between caregiver and recipient (internal resources), and the number of hours of formal services used by the elder (external resources).

The outcome of the proposed model—caregiver psychological well-being—is measured by risk of depression, for

several reasons. First, depression has been shown to be higher among caregivers than general populations (Gallagher et al., 1989; Tennstedt, Cafferata, & Sullivan, 1992). Second, depression is higher among women, who are a disproportionate percentage of the caregiving population (McGrath et al., 1990; Pruchno & Potashnik, 1989). Third, and importantly, untreated depression may lead to psychosocial difficulties, such as relationships with spouses and friends, enjoyment of leisure activities, general social adjustment, and overall contentment (Coryell et al., 1995). These symptoms and resulting behaviors can affect the quality of life for both the caregiver and the care recipient, as well as the continuity and quality of care provided to the disabled elder.

The goal of the analyses is to determine the relative effects of functional disability, cognitive impairments, and problem behaviors (stressors) on caregivers' psychological well-being, and to identify the factors that influence this relationship. Although the presentation of the conceptual model in Figure 1 shows the variables categorized by type, in the path modeling, the variables were entered individually, based on a logical order (Davis, 1985; Tabachnick & Fidell, 1989). Specifically, among the three stressors, the temporal order was assumed to be cognitive impairment, functional disability, and problem behaviors. For mediators, the order was assumed to be formal services, quality of relationship, emotional support, and mastery. Figure 1 shows the possible directions and ways in which the primary stressors may affect the outcome of psychological well-being. Based on previous research and using this stress-appraisal model of caregiving, three hypotheses were tested.

1. *The stressors—functional disability, cognitive impairment and problem behaviors—each affect caregiver psychological well-being, both directly and indirectly, through caregiver primary and secondary appraisals of the situation.* That is, the more disabled the elder, either physically or cognitively, and the more problem behaviors which are exhibited, the greater the risk of depression for the caregiver.
2. *Functional disability, cognitive impairment, and problem behaviors will also have direct and indirect effects (through caregiver primary appraisals) on caregiver overload (the secondary appraisal).*
3. *Resource mediators of two types—external and internal—will affect the relationships among the stressors, the appraisal variables, and the outcomes of depression and overload.* It is expected that greater use of formal services (external resource), higher levels of global mastery, a better quality of the relationship between the caregiver and care recipient, and emotional support available to the caregiver (internal resources) will reduce caregiver overload and, therefore, lessen the risk of depression for the caregiver.

SAMPLE

The Massachusetts Elder Health Project (MEHP) is a longitudinal study of a representative sample of older persons conducted in two major phases from 1984–1996. In Phase I, four waves of data were collected, from 1984–1991, at approximately 15-month intervals, to investigate the

needs for assistance with daily living activities (functional disability) as persons grow older, as well as the patterns and sources (both informal and formal) of this help. Phase II consisted of an additional four waves of interviews, at 5-month intervals, conducted from 1993–1996, to focus on the process of caregiving, from the perspectives of both caregiver and care recipient. The first wave of Phase II data was used in this analysis.

The sampling design for the original, geographically stratified random sample of 5,855 older adults aged 70 and older is described by Tennstedt and colleagues (1992, 1993a). The Phase II sample consists of two groups of elders: those who were functionally disabled and residing in the community at the last wave of Phase I, and a similar number of elders who were nondisabled at the end of Phase I, but were determined to be functionally disabled at the first wave of Phase II. Inclusion of this latter group of recently disabled elders permitted comparison of caregivers new to the role with those who had been providing care for an extended period of time. At each of the four waves in Phase II, the elder respondents were interviewed regarding their functional limitations, need for assistance in activities of daily living, and sources of this assistance. The elders' primary caregivers were interviewed regarding the types and amounts of care provided, their assessment of the care recipient's functional and cognitive status, their appraisal of caregiving stressors, coping mechanisms, and their physical and mental health status. Interviews were conducted primarily by telephone. Proxy interviews for elder respondents were conducted when necessary, usually because of hearing or cognitive impairments. Approximately one third of the elder sample had proxy interviews at each wave.

The analytical sample consists of 204 disabled elder/caregiver dyads (i.e., both were interviewed) at the first wave of Phase II. As can be seen from data in Table 1, the elders in the Phase II sample are quite old, with a mean age of 86.6 years, predominantly female and not married. They were quite disabled; 40% of the elders had some degree of cognitive impairment, although only 18% exhibited problematic behaviors. Given the age of the care recipients, the caregivers were also older (mean age: 62 years) than typically reported in other studies. Most were women and adult children of the care recipients. Probably related to their older age, less than half were employed.

MEASURES

Descriptive statistics and coding for the measures are displayed in Table 1. The contextual variables included in the analyses were selected through preliminary analysis of these data, and the results of other studies. Pearlin has suggested that the contextual variables may play a part in caregiver outcomes (Pearlin et al., 1990), but much of the caregiver research has not reported these effects when stressor and appraisal variables are taken into consideration (Lazarus & Folkman, 1984; Pearlin et al., 1990). Contextual variables were included in this analysis and included elder age, elder gender, caregiver age, caregiver gender, relationship of elder to caregiver, coresidence of the caregiver and elder, and caregiver employment. Elder and caregiver age (years) and elder and caregiver gender (male/female) were measured in traditional ways. Caregiver employment status was measured as employed versus not employed. A combination variable was constructed to measure coresidence and the relationship of the caregiver to the

Table 1. Descriptive Statistics ($n = 204$)

	Value <i>n</i> (%)	Range		Coding	Alphas
		Min	Max		
Elder					
Age: mean (<i>S.D.</i>)	86.6 (4.9)	79	101	years	
Gender (male)	51 (25.0)			0 = female, 1 = male	
Marital status (married)	52 (25.0)			0 = no, 1 = yes	
Cognitive impairment	61 (29.9)			0 = no, 1 = yes	
Problem behaviors	36 (17.7)			0 = no, 1 = yes	
Functional disability: mean (<i>SD</i>)	3.3 (1.4)	1	5	1–5 (5 highest disability)	
Caregiver					
Age: mean (<i>SD</i>)	62.1 (15.3)	23	90	years	
Gender (male)	64 (31.4)			0 = female, 1 = male	
Relationship to elder:					
Spouse	43 (21.1)				
Adult child	100 (49.0)				
Other	61 (29.9)				
Employed	84 (41.2)				
Log hours of informal care: mean (<i>SD</i>)*	2.2 (1.1)	0	4.6	log hours	
Log hours of formal services: mean (<i>SD</i>)*	1.1 (1.1)	0	3.7	log hours	
Quality of relationship: mean (<i>SD</i>)	15.4 (3.5)	6	20	higher = higher quality	.78
Emotional support: mean (<i>SD</i>)	27.6 (3.0)	15	32	higher = more support	.83
Mastery: mean (<i>SD</i>)	20.1 (3.8)	8	28	higher = greater mastery	.77
Overload: mean (<i>SD</i>)	7.8 (3.0)	4	16	higher = greater overload	.77
Depression (CES–D): mean (<i>SD</i>)	7.7 (2.6)	5	16	higher = more depressed	.65

*Hours are log transformed due to the skewness of the distribution.

care recipient because of previously reported differences in amount and type of care provided based on residency status compared to relationship status (Chappell, 1991; Tennstedt, Crawford, & McKinlay, 1993b). This combination term was coded as: coresident offspring, non-coresident offspring, coresident other relative or non-relative, and non-coresident other relative or non-relative. It was assumed that all spouse caregivers were coresident for this community-dwelling sample. The contextual variables are not included in the figures depicting the model, but they are included in the tables, due to the fact that these variables were designated as control or contextual variables, were not central to the hypotheses, and explained little in terms of the hypotheses.

The primary stressors consisted of level of functional disability, cognitive impairment, and problem behaviors. Disability level was determined by an algorithm based on: (a) the number of instrumental activities of daily living (IADLs: meals preparation, housework); and/or (b) basic activities of daily living (ADLs: personal care, dressing, and using stairs) which the elder reported difficulty performing. These data were collected from the elder (or from a proxy if necessary). Five levels of disability were defined: (1) no ADL problems; (2) one ADL problem and no IADL problems; (3) one ADL problem and any number of IADL problems, or two ADL problems and no IADL problems; (4) two ADL problems and any number of IADL problems; (5) three ADL problems and any number of IADL problems. The mean level of disability for the analytic sample was 3.19 ($SD = 1.39$).

The absence (0) or presence (1) of the elder's cognitive impairment was measured by data from one of three sources. Elders characterized as cognitively impaired were those who answered four or more questions incorrectly (i.e., adjusted for education) on the SPMSQ (Pfeiffer, 1975), those who required a proxy interview (and therefore had no SPMSQ score) because of dementia, and those who required a proxy interview for another reason and whose caregiver reported frequent problems with either memory loss or confusion.

Problem behaviors are highly associated with cognitive impairment, but not all elders with cognitive impairments have problem behaviors. It is important to understand whether it was the cognitive impairment itself which was difficult for the caregiver or if the behaviors associated with the impairment were actually more difficult to deal with. Caregivers were asked about the frequency in the previous two weeks of five specific behaviors: wandering, yelling or cursing, hitting, acting inappropriately, or accusing others of stealing. The measure was dichotomized (0 if no problem behaviors and 1 if any problem behaviors) due to the skewness of the distribution.

Variables thought to influence the relationship between the primary stressors and the outcome of depression can be categorized as follows: (a) primary appraisal, measured by hours of informal care provided; (b) resources, including formal services as an external resource and quality of relationship, emotional support, and mastery as internal resources; and (c) secondary appraisal measured by overload. All of these data were collected from the caregiver. Amount of informal care was measured by the total hours of care

per week provided in each of seven areas: personal care (including medication and health related tasks), housekeeping, meal preparation, shopping, transportation, assistance with finances, and assistance with obtaining health and medical services. This measure was defined as extra time spent on specific caregiving tasks, which was provided because of the elder's health or functional disability as reported by the primary caregiver. This definition distinguished informal care from usual household tasks, especially housekeeping and meals, performed by a caregiver. Hours of care were log transformed for the analysis due to skewness of the data, using a standard formula which adds one hour to each participant's hours of care.

Formal service use was measured by the total number of hours per week of community long-term care services received by the elder including home health care, home-delivered meals, homemaker services, transportation, financial management, and case management or social work. As for the hours of informal care, these data were collected from the caregiver.

Mastery can be described as a positive view of one's ability and ongoing behavior during the caregiving process (Lawton et al., 1989). An alternative interpretation of mastery is a relatively stable view of the self that includes the expectation that one is capable of dealing with, or has control over, issues in their lives as they arise (Pearlin et al., 1990). Both definitions imply that mastery is negatively related to distress, specifically the stress of caregiving (Miller et al., 1995). The global mastery scale consisted of eight items which relate to the overall control that individuals felt they had in their life, such as how much they felt they could change their lives, feeling helpless in dealing with problems of life, how much control of the future they had, and what they thought they could do in their lives (Pearlin et al., 1990). Responses were coded on a four-point scale, from strongly disagree (1) to strongly agree (4).

Emotional support consists of the perceived level of emotional support that caregivers received from friends and relatives. This was measured by an eight-item scale in which the responses were coded on a 4-point scale, from "strongly agree" to "strongly disagree." The questions focused on issues of trust, caring (from others), ability to confide in someone, and expression of support to caregiver by others (Pearlin et al., 1990). The quality of the relationship between caregiver and care recipient was measured by five items from Bengtson's and Schrader's Positive Affect Index (1982). The items assessed general feelings of closeness about the relationship, similarity in views about life, getting along, and doing things together. The response categories for the items ranged from "not at all" (1) to "very close" (4). Caregiver overload was measured by the four-item scale of Pearlin and colleagues (1990), which indicates how much an individual feels overwhelmed by the tasks of caregiving, specifically perceptions of exhaustion, having enough time for oneself and to do required tasks of caregiving, and perceived progress in terms of caregiving. It measures the perceptions of the caregiver regarding the caregiving experience, and his or her ability and energy in terms of caregiving and general life experience.

Caregiver depression was assessed using the five-item

version of the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977; Shrout & Yager, 1989). Responses range from “hardly ever” (1) to “most of the time” (4).

STATISTICAL ANALYSIS

Path analysis was used to test the proposed model and study hypotheses. The path regression coefficients (standardized) were estimated by fitting ten ordinary least squares regression models. The three stressor variables (level of functional disability, cognitive impairment, problem behaviors), the one primary appraisal variable (log hours of informal care), four resource variables (log hours of formal services, quality of relationship, mastery, and emotional support), the one secondary appraisal variable (overload), and the outcome variable (depression) were used separately as the dependent variable of each of the ten regression models. The independent variables of each of the ten models included the variables preceding the dependent variable in the path model (Figure 1), plus the contextual variables. Caregiver characteristics were not included as the contextual variables in each of the three regression models which used one of the three stressors as the dependent variable because they were not expected to be related to the elder's level of functional disability, cognitive impairment, or problem behaviors. The direct and indirect effects of one variable on the other were then estimated using these regression models.

Specifically, hypothesis one was tested by estimating the direct and indirect effects of the primary stressors on depression. The direct effects were estimated by the regression coefficients obtained from the model, which used depression as the dependent variable. The indirect effects of the primary stressors on depression through appraisals were estimated by the direct effect of primary stressors on appraisals, and the direct effects of appraisals on depression. Similarly, hypothesis two was tested by estimating the direct and indirect effects of primary stressors on overload. For hypothesis three, the intervening effects of resource variables and appraisals (informal care log hours and overload) on the relationship of primary stressors and depression were tested by estimating the indirect effects of primary stressors on depression through resource variables and appraisals. The intervening effects of resources vari-

ables and the primary appraisal (informal care log hours) on the relationship of primary stressors and overload were tested in the same manner.

RESULTS

The bivariate correlations of the variables included in the path analysis are displayed in Table 2. Looking first at the primary stressors, as might be expected, the presence of cognitive impairment is positively related to the level of functional disability and the presence of problem behaviors. All three of the stressors, in turn, are related to the primary appraisal variable—the hours of informal care provided to the elder. The primary stressors are also related to the resource variables. The level of functional disability and cognitive impairment, but not the presence of problem behaviors, are related to the hours of formal service received by the care recipient. The quality of the caregiver-care recipient relationship is related negatively to presence of cognitive impairment and problem behaviors, but not to level of functional disability. Of the three stressors, only presence of problem behaviors is related to the secondary appraisal of caregiver overload and to the outcome of caregiver depression. The primary appraisal of hours of informal care is related to both the secondary appraisal (overload) and to the outcome of caregiver depression, but not to any of the resource variables. Among the resource variables, caregiver mastery is positively related to relationship quality and the receipt of emotional support. Mastery and caregiver relationship are negatively related to the secondary appraisal of overload and, along with emotional support, to caregiver depression. Finally, the secondary appraisal of caregiver overload is positively related to the outcome of caregiver depression.

The results of the path analysis (Table 3 and Figure 2) partially support the first hypothesis, that the stressor variables affect caregiver risk for depression. While cognitive impairment, greater functional disability, and problem behaviors were all associated with risk for depression, the effects of each stressor were primarily indirect. Further, the paths leading from the effects of elder functional disability, cognitive impairment, and problem behaviors on their caregiver's risk for depression all went through both the subjective appraisal variables and/or the resource variables. That is, the path from functional disability to caregiver depression went through

Table 2. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10
1. Cognitive impairment	1.000									
2. Functional disability	0.148*	1.000								
3. Problem behaviors	0.344***	0.017	1.000							
4. Log informal care hours	0.313***	0.224**	0.245***	1.000						
5. Log formal service hours	0.149*	0.427***	-0.013	-0.074	1.000					
6. Relationship quality	-0.141*	0.064	-0.365***	-0.064	0.000	1.000				
7. Emotional support	0.034	0.016	-0.021	0.006	0.108	0.099	1.000			
8. Caregiver mastery	-0.062	0.067	-0.167	-0.130	0.032	0.210**	0.281***	1.000		
9. Role overload	0.126	0.100	0.222**	0.288***	0.055	-0.265***	-0.070	-0.362***	1.000	
10. Caregiver CES-D	0.074	-0.017	0.284***	0.145*	0.023	-0.328***	-0.291***	-0.491***	0.438***	1.000

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Table 3. Standardized Regression Coefficients of All Paths

Independent Variables	Dependent Variables									
	Cognitive Impairment	Functional Disability	Problem Behaviors	Informal Care	Formal Services	Relationship Quality	Emotional Support	Mastery	Overload	Depression (CES-D)
Elder Age	.09	.13	-.10	.01	.17**	.04	-.02	.08	-.14*	.03
Male Elder	.06	.07	.11	-.08	-.04	-.18*	-.17*	.04	.06	.06
Caregiver Age				-.04	.09	-.10	-.01	-.20	-.08	-.11
Male Caregiver				-.01	.09	-.20**	-.15*	.03	-.13	-.05
Caregiver Employment										
Nonemployed				.12	-.13	.07	-.02	.10	-.09	.08
Part-time				-.05	.02	-.12	-.13	-.05	-.09	-.01
Full-time (reference)										
Relationship × Coresidence										
Nonresiding offspring				-.28**	.27**	-.15	.15	.10	.21	.03
Nonresiding other/non-relatives				-.43***	.29**	-.06	.32**	.16	.14	.04
Coresiding offspring				.04	-.09	-.07	.14	.22*	.14	.02
Coresiding other/non-relatives				-.09	-.01	-.23*	.07	.05	.16	.04
Spouse (Reference)										
Cognitive Impairment		.13	.35***	.14*	.19**	-.05	.02	.003	-.03	-.07
Functional Disability			-.03	.18**	.41***	.09	-.01	.10	.04	-.05
Problem Behaviors				.15*		-.32***	.002	-.09	.03	.12
Informal Care					-.03	.004	.12	-.11	.28***	.04
Formal Services						-.03	.06	-.07	.07	.07
Relationship Quality							.04	.13	-.18**	-.14*
Emotional Support								.22**	-.03	-.18**
Mastery									-.33***	-.33***
Overload										.23***
R ²	.01	.04	.14	.35	.39	.22	.15	.22	.33	.41

* $p < .05$; ** $p < .01$; *** $p < .001$.

hours of informal care and overload. Higher levels of disability, cognitive impairment, and the associated problem behaviors led to more hours of care, to greater overload, and, ultimately, to greater risk for depression. The effect of elder cognitive impairment on caregiver depression was through three intervening variables: first, through problem behaviors and resulting hours of care; second, through hours of informal care and overload; and third, through problem behaviors to quality of relationship and overload.

Problem behaviors had an indirect effect on caregiver depression through the quality of the relationship between the elder and the caregiver. This path went to overload and then depression, as well as through mastery to depression. The path from problem behaviors also went through hours of informal care to overload and depression.

The results of the path analyses also partially support the second hypothesis. The effect of the caregiving stressors on overload was similar to the effect of the stressors on caregiver depression. Elder functional disability and cognitive impairment did not affect caregiver overload directly, but did so indirectly, through the hours of informal care pro-

vided to the elders. The effect of cognitive impairment on caregiver overload was also evident through its relationship to problem behaviors, and then through the amount of informal care provided. Problem behaviors had no direct effect on caregiver overload, but did have indirect effects on overload through the amount of care provided and the quality of relationship. In addition to the direct effect of cognitive impairment on hours of informal care, the presence of problem behaviors also mediated the effect of cognitive impairment on hours of informal care, and, subsequently, on caregiver overload. That is, a cognitively impaired elder exhibiting problem behaviors received more care, and, consequently, the caregiver experienced a greater sense of overload.

The third hypothesis refers to the relationships between the two sets of caregiver appraisals and caregiver psychological well-being. This hypothesis was also partially supported by the results of the path analysis. To test this hypothesis, caregiver overload, the secondary appraisal, was used both as an intervening variable and as a dependent variable. This was done in order to understand how the

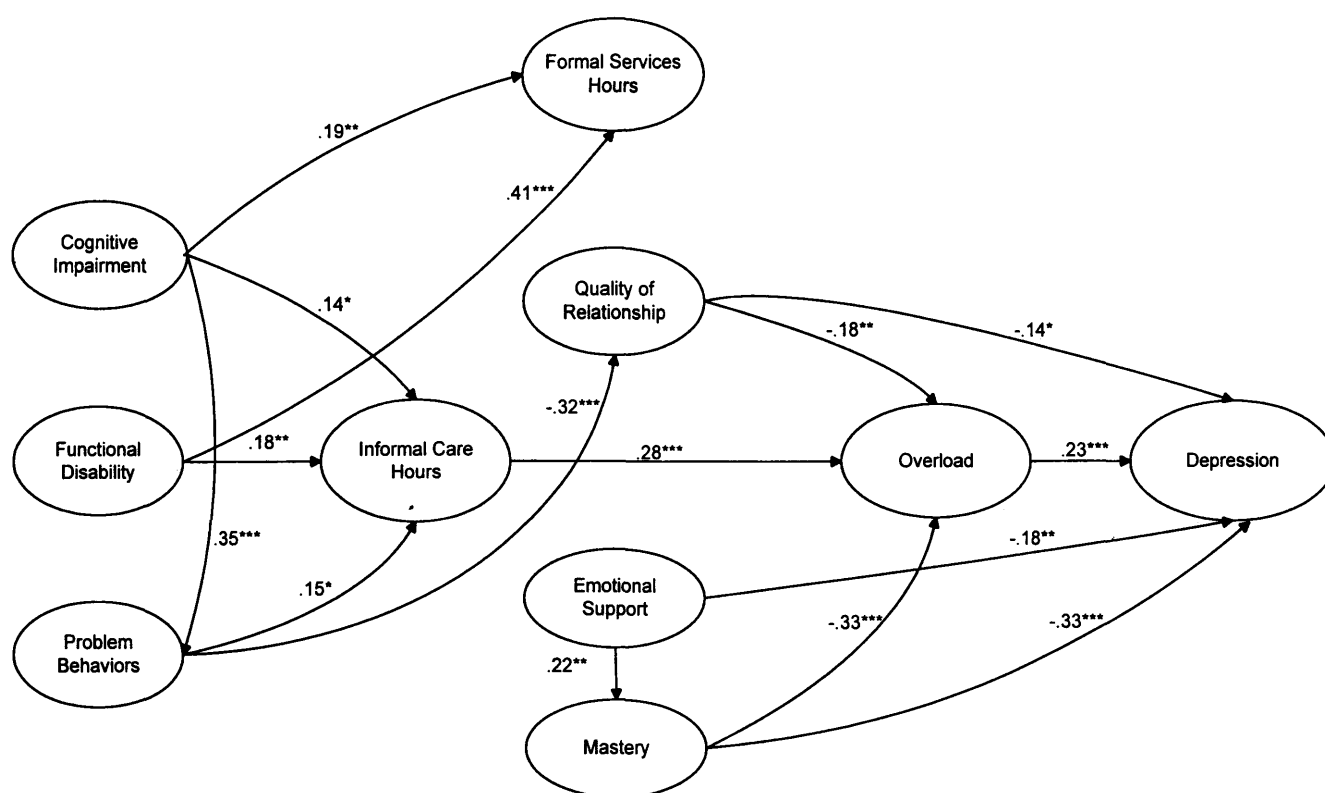


Figure 2. Results of path analyses.

stressors and resource variables differently affect overload and depression, and, ultimately, to understand how the appraisals affect caregiver depression. The data show that hours of informal care, the primary appraisal, had a powerful relationship with the outcomes of overload (directly) and depression (indirectly). The data also showed that elders with higher levels of functional disability, with cognitive impairments, and with associated problem behaviors received more informal care. The amount of informal care had a significant direct effect on caregiver overload which then led to depression. This indicates that the caregiving stressors affected caregiver overload and depression indirectly through hours of informal care. That is, more hours of care determined and provided by the caregiver led to higher levels of caregiver overload and greater risk of depression for the caregiver.

As shown in these figures and in the other presentations of the data, overload, or the secondary appraisal of the caregiving situation, was strongly related to depression. Caregivers' overload and risk of depression had a high zero-order correlation ($r = .44, p < .001$), and the association between these two variables remained significant even after controlling for the primary stressors, hours of informal care, formal service elders received, resources, and the caregiver characteristics. This finding suggests that secondary appraisal is related directly to the caregiver's risk of depression.

The resource variables expected to influence the untoward effects of the stressors on caregiver well-being were

use of formal services, a sense of mastery, quality of relationship, and emotional support. The only resource variable that had a substantial and statistically significant mediating effect on the relationship between the stressors and caregiver overload and caregiver depression was the quality of relationship between elder and caregiver. That is, caregivers of elders with problem behaviors were more likely to have a poor quality of relationship with the elder, and those who had a poor quality of relationship with their care recipients were likely to report greater levels of overload and ultimately were at higher risk of depression. It appears from the paths that cognitive impairments themselves did not lead to a poor quality of relationship, but that the problem behaviors associated with cognitive impairments were what negatively influenced the quality of relationship.

Caregiver mastery and emotional support also affected caregiver overload and depression. Both had direct effects on depression. Mastery also had a direct effect on overload, whereas the effect of emotional support on overload was indirect, through mastery. Regardless of the level of primary stressors, caregivers with high level of mastery perceived less overload and were at lower risk of depression. Similarly, those who indicated higher levels of emotional support were at lower risk of depression.

The data showed that elders with high levels of cognitive impairment and elders with high levels of functional disability received more formal services. Nonetheless, the data failed to support the hypothesis that increased use of formal service by the elders would reduce caregiver overload and risk of depression.

DISCUSSION

To summarize the major findings, the primary stressors (or needs for care) were related to greater risk of caregiver depression as hypothesized, but indirectly through the associated higher levels of informal care which resulted in a sense of overload for the caregiver. In addition, the presence of problem behaviors associated with cognitive impairment had a negative effect on the quality of the caregiver-care recipient relationship that, in turn, led to greater overload and risk of depression. Three of the four resource variables—relationship quality, emotional support, mastery—mediated the untoward effects of the primary stressors on caregiver well-being. Only use of formal services did not influence the effects of the stressors on caregiver overload and depression.

The results of these analyses are quite complex. However, caregiving is a complex process. The results of this analysis can be used to explain the minimal therapeutic effect of many intervention trials to date and can serve two specific purposes. First, several factors have been identified to inform the development of supportive or therapeutic interventions. Second, the conceptual model facilitates further understanding of the process of appraisal of the caregiving situation.

To date, most interventions have taken an approach which is directed at relieving caregiver burden, without a full understanding of the contributors to burden. Caregiver services have been developed in two specific areas, which have seen limited success. The first of these is respite services for caregivers (Montgomery, 1992; Cox, 1997). The second category of services provided has been in the area of caregiver support (Gatz, Bengtson, & Blum, 1990). While there has been some success in the area of caregiver services, it is possible that the type of support, or the emphasis of the supportive intervention, was misdirected. The findings from this study support a more upstream approach, in order to relieve caregiver overload and depression. This upstream approach, described by McKinlay (1975, 1996) as one which attempts to intervene before an issue becomes a problem too difficult to solve, would focus on the contributors to overload and attempt to intervene in a way that prevents overload, rather than simply relieving it. In the case of caregiver overload and depression, interventions directed at how caregivers appraise the needs for care (primary appraisal) might prevent later problems with overload and depression, which occur after the primary appraisal has been made. Such interventions at this level might address issues of evaluating the elder's needs, coming to terms with the needs of the elder versus the caregiver's ability and willingness to provide care, and developing strategies to prevent overload, by training caregivers in technical skills or in obtaining emotional support before they actually need it.

Taking an upstream approach, the findings regarding mastery suggest that it might be an effective focus of intervention. Mastery has traditionally been seen as a relatively stable concept, but there is evidence that global mastery is subject to change (Bandura, 1977; Lachman, Ziff, & Spiro, 1994). For caregivers with a higher sense of mastery, the perception of overload and risk of depression were lower. These results support the development of an intervention

directed at increasing a caregiver's sense of mastery, either in a general sense, or specifically to caregiving. Interventions might be done in individual or group settings, and would include supportive educational approaches to develop skills, information to empower caregivers, and reaffirmation of their existing skills, abilities, and knowledge.

Emotional support is another potential intervention focus. It also had a direct effect on depression, with higher levels of emotional support directly associated with lower levels of depression. Although emotional support was not directly associated with overload, it was associated with higher level of mastery which, in turn, decreased overload. Interventions have traditionally been directed towards encouraging caregivers to participate in caregiver support groups. It has been shown, however, that even when caregivers participate enthusiastically in caregiver support groups, there are few to no effects on caregiver psychological well-being (Gatz, Bengtson, & Blum, 1990). Therefore, what may be needed is a way for caregivers to obtain more support, or to reevaluate their perceived support from their family and friends. This may be addressed through individual counseling or specifically focused interventions to develop skills to elicit desired emotional support from family and friends.

Another resource variable that affected both caregiver overload and depression was the quality of relationship between the caregiver and care recipient. Orona's work (1990) with caregivers of Alzheimer's disease patients suggests that a reason for reduced quality of relationship is the loss of their relationship with a loved one. Intuitively, it could be said that the decline in the quality of the relationship between the caregiver and care recipient, especially if it is due to cognitive impairments and problem behaviors, is not amenable to change or intervention. It is also possible that the period of actual caregiving is neither the most appropriate, nor the only time for intervention. The change in the quality of the relationship, and its effects on caregiver well-being, may be inevitable short-term consequences of a difficult caregiving situation—grieving the relationship loss. Interventions might be more appropriate at a later time if the caregiver's depression continues after the individual has been placed in an institution or has died. Nonetheless, it is critical to understand the importance of the association between the quality of the relationship and caregiver overload and depression, especially for those caregivers providing care for individuals with cognitive impairments.

Finally, while it seems quite plausible that use of formal services would alleviate the caregiver's sense of overload, in this study, use of services did not alleviate either caregiver overload or depression. Instead, services may be used to maintain the continuity of care as the needs for care increase, rather than to substitute for informal care or to relieve an overloaded caregiver. It is consistent with related findings from this study, as well as results from other studies, that formal services do not reduce the amount of informal care provided, but, rather, supplement the care (Tennstedt, Crawford, & McKinlay, 1993a). So, although formal services might be necessary as the elder becomes more functionally disabled, use appears to have little or no effect on caregiver well-being.

The findings from this analysis provide some important additions to the caregiving literature. The findings are derived from a population-based sample followed since 1984. An obvious benefit of this study is that it is possible to obtain a comprehensive understanding of older persons with physical and cognitive impairments, and of their caregivers. Importantly, the findings show that even in a community sample of care recipients with a wide range of disabilities, it is cognitive impairments and associated problem behaviors that have strong negative effects on caregiver well-being by affecting the hours of informal care needed (or provided) and the quality of the relationship with the care recipient, both of which can cause a more stressful or frustrating situation. This supports and explains further some of the findings reported in earlier studies of caregivers of cognitively impaired elders (Li et al., 1997; Majerovitz, 1995; Moritz et al., 1992; Schulz et al., 1995). However, given the duration of the study and the field design, there are some limits to the generalizability of these findings. The original sample of older persons consisted of those who were 70 years of age and older, at baseline, in 1984. Further, persons admitted to nursing homes were not included in follow-up interviews after the first wave. As a result, the sample in this analysis is representative of surviving elders older than the age of 80, who live in the community.

Given these limitations, the results of this study support the usefulness of the conceptual model used in these analyses for investigating caregiver well-being. In particular, the model can be used to further understand the process of appraisal, which has been found by others to be linked to negative caregiver outcomes (although previously, the secondary appraisal has been used as the only appraisal variable). The primary appraisal process consists of evaluation of the health and disability of the care recipient, determination of the level of care needed, determination of who will provide the care, how and where the care will be provided, and determination of resources available to support the caregiving process. It is this appraisal or evaluation and decision process which has been overlooked or minimized in the literature to date. The model provides further understanding of how primary appraisal is related to multiple factors, including need for care, sociodemographic characteristics of caregivers and care recipients, and use of resources. This analysis has demonstrated how the primary appraisal process is linked to both mediators and the secondary appraisal process. It demonstrates the effects of primary appraisal on secondary appraisal, and on the role of mediators on the outcome of caregiver psychological well-being. Ultimately, the model illustrates the need for further understanding of the primary appraisal process and its relationship to secondary appraisal and caregiver well-being.

Further research should be directed toward using this model to determine how the factors that contribute to primary appraisal fit into the overall picture of caregiver well-being. It is possible that intervention at the level of primary appraisal could be effective in later reducing caregiver overload and depression. Because this model clearly identifies areas in which interventions may occur (by revealing the direct and indirect effects of mediators, including appraisals), it can also be used to evaluate the potential effec-

tiveness of interventions in these areas on caregiver overload and caregiver psychological well-being. A greater understanding of the interrelatedness of primary and secondary appraisals, provided by this model, can lead to the design of more effective interventions to reduce the risk for caregiver overload and depression, and the associated effects on the recipient of care.

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Address correspondence to Sharon Tennstedt, New England Research Institutes, 9 Galen Street, Watertown, MA 02172. E-mail: sharont@neri.org

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