

Associations of Stressors and Uplifts of Caregiving With Caregiver Burden and Depressive Mood: A Meta-Analysis

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In the present meta-analysis, we integrated findings from 228 studies on the association of six caregiving-related stressors and caregiving uplifts with burden and depressed mood. Care recipients' behavior problems showed stronger associations with caregiver outcomes than other stressors did. The size of the relationships varied by sample characteristics: Amount of care provided and care receivers' physical impairments were less strongly related to burden and depression for dementia caregivers than for caregivers of nondemented older adults. For spouse caregivers, physical impairments and care recipients' behavior problems had a stronger relationship to burden than for adult children. Furthermore, we found evidence that the association of caregiver burden with the number of caregiving tasks, perceived uplifts of caregiving, and the level of physical impairment of the care receiver were stronger in probability samples than in convenience samples.

RECENT gains in life expectancy have been accompanied by longer periods of disability (Dinkel, 1992). In industrial countries such as the United States, approximately 80% to 85% of help and care services to elderly people is provided by informal helpers, such as spouses and adult children (Stone, Cafferata, & Sangl, 1987). Providing care for disabled older adults has been described as a stressful experience that may erode the physical and psychological health of the caregiver (CG; e.g., Aneshensel, Pearlin, Mullan, Zarit, & Whitlach, 1995; Fengler & Goodrich, 1979). In the past two decades, more than 400 empirical studies on psychological effects of caregiving for older adults have been published, most of them focusing on CG burden (e.g., Arai & Washio, 1999; Clyburn, Stones, Hadjistravropoulos, & Tuokko, 2000) and depression (e.g., Aneshensel et al., 1995; Clyburn et al., 2000).

The overall impact of physical, psychological, social, and financial demands of caregiving has been termed *caregiver burden* (George & Gwyther, 1986). CG burden can be further differentiated into objective burden (events and activities associated with negative caregiving experience, practical consequences of physical and behavioral changes of the care receiver [CR]) and subjective burden (emotional reactions of the CG, such as worry, anxiety, frustration, and fatigue; e.g., Montgomery, Gonyea, & Hooymann, 1985). Because objective and subjective burdens are moderately to strongly correlated (e.g., Montgomery et al., 1985, $r = .34$; Beery, Prigerson, & Bierhals, 1997, $r = .70$), most researchers use a global burden measure that sums up indicators of objective and subjective burdens to a global burden score (e.g., Zarit, Reever, & Bach-Peterson, 1980). With regard to depression, most research with CGs has focused on depressive symptoms, such as sadness or loss of energy, rather than on the diagnosis of clinical depression (see, e.g., Schulz, O'Brien, Bookwala, & Fleissner, 1995).

Several models of predictors of CG burden and depression have been suggested in the literature (e.g., Fingerman,

Gallagher-Thompson, Lovett, & Rose, 1996; Gallagher-Thompson & Powers, 1997; Kramer, 1997; Pearlin, Mullan, Semple, & Skaff, 1990; Schulz, Thomkins, Wood, & Decker, 1987; Yates, Tennstedt, & Chang, 1999). They usually include two kinds of predictor variables: (a) factors that are unique to the caregiving context (CR characteristics, duration and amount of caregiving) and (b) factors associated with general risks for impaired psychological health, such as financial stress and being female (see also Ory, Yee, Tennstedt, & Schulz, 2000). In the present meta-analysis, we focused on caregiving-specific variables that may show stronger and more consistent associations with CG burden and depression than the general risk factors (e.g., Schulz et al., 1995).

Previous efforts to integrate the bulk of empirical results with the help of qualitative analysis (e.g., Bédard, Pedlar, Martin, Malott, & Stones, 2000; Bookwala, Yee, & Schulz, 2000; Connell, Janevic, & Gallant, 2001; Schulz et al., 1990, 1995) have reported inconsistent results and have sometimes come to different conclusions. For example, conclusions differ regarding whether there is a significant association between the level of CR physical impairment and CG depression (Schulz, Visintainer, & Williamson, 1990; Schulz et al., 1995). This may be due to four shortcomings of qualitative reviews. First, all studies usually receive equal weight. However, studies with larger samples provide more reliable results (e.g., Rosenthal, 1991). Second, small and medium statistical effect sizes may not be detected in studies with small sample sizes. For example, in Baumgarten's (1989) review of 24 CG studies, the median sample size was 54. Therefore, whether small- or medium-sized statistical effects (e.g., $r = .10$ – $.30$; J. Cohen, 1992) are significant often depends more on differences in sample sizes than on effect size. Third, qualitative reviews often have to focus on a limited number of studies (e.g., those published in the previous 5 years; Schulz et al., 1995) rather than trying to integrate the broad array of available studies. Finally, qualitative reviews also preclude testing for the significance

and homogeneity of statistical effects and for the influence of moderator variables (e.g., study characteristics) on observed caregiving effects. Meta-analysis not only integrates a broad array of literature but also allows a test for small and medium effects by aggregating statistical effects across samples, while also testing for significance and homogeneity of effects.

In the present study, we used meta-analysis to statistically integrate results on the association between stressors and uplifts of caregiving with CG's psychological health. Because most studies assess psychological health by measuring CG burden and depression, we focused on these variables. CG burden and depression were considered as separate variables rather than as two facets of psychological outcomes, because burden assesses outcomes that are specific to caregiving, whereas depression is more global and is influenced by many other variables, such as critical life events, physical illness of the CG, and genetic factors (e.g., Blazer, 1993).

In the first step of our meta-analysis, we analyzed which variables would show the strongest associations with CG burden and depression. In the second step, we analyzed whether the size of the relationship is influenced by sample characteristics, such as whether the sample is a probability sample or a convenience sample, whether respondents are dementia CGs or CGs for physically frail older adults, and whether CGs are spouses or adult children.

ASSOCIATIONS OF SPECIFIC STRESSORS AND UPLIFTS WITH CG BURDEN AND DEPRESSION

The present study focuses on two classes of stressors—type of care receiver impairment and level of CG involvement—as well as uplifts of caregiving. Too few studies were available on secondary stressors that are indirect consequences of providing care (such as caregiving–work conflicts; Pearlin et al., 1990) to perform meta-analyses on them.

Care Receiver's Impairments

Three aspects of CR impairments have been related to CG outcomes: the level of physical impairment (deficits in activities of daily living [ADL] and instrumental activities of daily living [IADL]), the level of cognitive impairment (e.g., attentional and memory problems), and the presence of behavior problems that are common in dementia (e.g., disruptive and aggressive behavior; Schulz et al., 1990; Yates et al., 1999).

Level of physical impairment.—Previous empirical studies and qualitative reviews of the literature have come to inconsistent conclusions on whether greater CR impairment in ADL and IADL is associated with higher levels of CG burden and depression. For example, in their 1990 qualitative review on CG research, Schulz and associates concluded that the more severely impaired the patient, the greater the depressive symptomatology. In their later qualitative review of 5 years of research on dementia CGs, however, Schulz et al. (1995) found that only one study reported a positive relationship between functional impairment of the patient and CG depression, while nine studies did not find such a relationship. These differences may indicate that associations of physical impairments of the CR with CG distress are only found in CGs for nondemented elderly people because such studies were included in the first, but not the second, qualitative review.

Alternatively, differences between the two reviews may be due to the small to medium effects of CR's physical impairments on CG burden and depression, which are detected only in studies with large sample sizes. Also, the association between physical impairments of the CG and psychological outcomes of the CG may be moderated by other variables, such as sample characteristics. For example, greater physical impairments of the CR may be more distressing for spouses than for adult children, because their own health problems interfere with the provision of care (Connell et al., 2001). These factors could not be tested in previous reviews.

Level of cognitive impairments.—Results on the impact of cognitive impairments of the CR on CG burden and depression are also inconsistent. Schulz et al. (1995) found a significant relationship between patient's cognitive functioning and CG depression in two out of eight studies of dementia CGs. Similarly, in their review of mixed CG studies, Bédard et al. (2000) found a significant association between cognitive status of the CR and CG burden in only 12% of the studies reviewed. In another 20%, the association was unclear (e.g., not tested or reported). Here, too, the heterogeneity of results may indicate that the association of CR's cognitive impairment with CG burden and depression is small and therefore hard to detect in small samples. The size of the relationship may also be attenuated in nonrepresentative samples of highly distressed dementia CGs with restricted variance of CR cognitive impairment.

Behavior problems.—The results are clearer with regard to CRs' behavior problems. For example, in 74% of the studies reviewed by Bédard et al. (2000), behavior problems of the CR showed the strongest relationship with CG burden. Similarly, Schulz et al. (1995) reported that behavior problems are consistently related to CG distress and depression. Including this variable enables us to test whether CRs' behavior problems are more strongly associated with CG burden and depression than CRs' physical and cognitive impairments.

CG Involvement

Amount of care provided.—The amount of care provided has been assessed by the number of caregiving hours (e.g., Garity, 1997) and the number of caregiving tasks (e.g., Gold, Franz, Reis, & Senneville, 1994). Although theoretical models of caregiving outcomes have suggested that providing more care is related to greater CG burden and more depression (e.g., Yates et al., 1999), this relationship holds in some studies (e.g., Baumgarten et al., 1992), but not in others (e.g., Dura, Stukenberg, & Kiecolt-Glaser, 1991b; see also Schulz et al., 1995).

Duration of caregiving.—There are three contradictory hypotheses regarding the association between the duration of performing the CG role and psychological effects on the CG (for an overview, see Haley & Pardo, 1989; Townsend, Noelker, Deimling, & Bass, 1989). The *wear-and-tear hypothesis* predicts that the longer caregiving is sustained, the greater the decline in CG subjective well-being. Chronic stress

and steady progression of a CR's illness may erode the CG's coping resources. The *adaptation hypothesis* suggests that CGs will adapt to the stress of caregiving over time. Negative affect may increase after taking over the CG role, with distress being highest at midpoint of care, when behavior problems due to dementia are most frequent. However, negative affect will decline thereafter as a result of adaptational processes or because of a decrease of CR's problem behavior. The *trait hypothesis* suggests that because of CGs' preexisting resources, such as resilience or coping skills, CGs will maintain a constant level of adaptation despite CR deterioration. In addition, if caregiving demands increase at the same rate as the ability to cope with those demands, there should be, on average, only small associations of the duration of caregiving with CG burden and depression. Consistent with the competing theoretical approaches, Schulz et al. (1995) found inconsistent results on the association of the duration of caregiving with caregiving outcomes.

Uplifts of Caregiving

Caregiving has not only stressful aspects, but is also a source of positive affect, such as feeling useful, appreciating closeness to the CR, and experiencing pride in one's own abilities to handle crises (for an overview, see Kramer, 1997). These uplifts may reduce the levels of CG burden and depression. However, the associations between uplifts and psychological outcomes are also inconsistent. For example, whereas Dorfman, Holmes, and Berlin (1996) found such a relationship for burden and Motenko (1989) found one for depression, Nijboer, Triemstra, Tempelaar, Sandman, and van den Bos (1999b) did not replicate these findings.

Moderating Effects of Sample Characteristics

Several researchers have noted that specific subgroups of CGs may respond differently to caregiving stress. If these different response patterns are not taken into account, they increase error variance in analyses, which leads to the dilution of statistical associations (Bédard et al., 2000; Pearlin et al., 1990). Thus, an important cause of the heterogeneity of previous results may be the moderating effect of sample characteristics. In the present meta-analysis, we investigated whether the size of caregiving effects is influenced by (a) the sampling procedure, that is, whether probability samples or convenience samples were studied; (b) illness characteristics of the CR, that is, whether CGs of demented older adults, CGs of physically frail and nondemented adults, or a combination of both groups are studied; and (c) whether CGs are adult children or spouses. Other sample characteristics, such as gender and ethnicity, were not included in the present meta-analysis because only a very small number of studies are available that address correlates of burden and depression in homogeneous samples of ethnic minorities ($k = 8$) and male CGs ($k = 13$).

Sampling procedure.—We expected CR impairments and the amount of care provided to be more strongly associated with CG burden and depression in studies using probability samples than in those using convenience samples. Existing recruitment strategies are often focused on individuals who are distressed or who seek psychological help, such as members of self-help groups. Schulz and associates (1990) reported that samples that

are more representative of a particular caregiving population have less depressive symptomatology. The focus on distressed samples may restrict the observed variance of the objective stressors and of psychological outcome variables, thus leading to smaller correlations between variables.

Caregiving of cognitively versus physically impaired older adults.—Because a large number of studies combined CGs for demented and physically frail older adults (e.g., cancer patients, hip fracture patients), we separated and compared studies of dementia CGs, studies of CGs for older adults without dementia, and studies of mixed CGs. We expected behavior problems and cognitive problems to be more strongly related to CG burden and depression for dementia CGs and mixed CG samples than for CGs for physically impaired adults because behavioral and cognitive problems are more common in dementia than in other forms of illness (e.g., Ory et al., 2000). Previous qualitative reviews of the caregiving literature (Bédard et al., 2000; Schulz et al., 1990, 1995) also led us to hypothesize that physical impairments may be more strongly associated with burden and depression for CGs of physically impaired elders than for CGs of cognitively impaired older adults. Although dementia patients have considerable deficits of ADL and IADL, these factors may be of secondary importance for dementia CGs, given the prevalence of disturbed behavior, such as wandering or repetitive questioning (Teri et al., 1992). Similarly, the amount of care provided, and the number of caregiving tasks in particular, may show stronger associations with CG burden and depression for CGs of physically impaired older adults than of cognitively impaired older adults.

In addition, we expected that a positive association of CG burden and depression with the duration of performing the CG role (the wear-and-tear hypothesis; Haley & Pardo, 1989; Townsend et al., 1989) would be more likely in CGs for older adults with dementia than for those with physical impairments because providing dementia care is perceived as more stressful and may more easily erode the resources of the CG (e.g., Coen, Swanwick, O'Boyle, & Coakley, 1997). Also, dementia CGs are faced with unpredictable and uncontrollable deterioration of the CR (Ory et al., 2000) that make psychological adjustments more difficult, compared with CGs of physically impaired older adults.

Spouses versus adult children.—Spouses may be more distressed by CR's physical impairments than adult children, because age-associated health problems and functional impairments of the CG make the provision of physical care increasingly difficult (Connell et al., 2001; Schneider, Murray, Banerjee, & Mann, 1999). It is less clear whether the association of CG burden and depression with cognitive and behavior problems of the CR and with the amount of care provided would be stronger in spouses than in adult children. For example, although an age-associated decrease in health may make extensive caregiving tasks more difficult for spouses than for adult children, the latter group may be more vulnerable to distress due to conflicting demands (e.g., care-work conflicts; Baring, MacEwen, Kelloway, & Higginbottom, 1994; Reid & Hardy, 1999; Stephens, Franks, & Townsend, 1994).

In sum, previous studies, including qualitative reviews, have found inconsistent results with regard to the relationship of CR impairment and CG involvement to CG burden and depression. We expected in our first research question that there would be a strong relationship between CRs' problem behavior and CG burden and depression and a small to medium statistically significant association of functional and cognitive impairments of the CR, CG involvement, and uplifts of caregiving with burden and depression. A second source of the heterogeneity of previous results may be that the size of the observed relationships varies by sample characteristics. Therefore, we expected in our second research question that the size of the relationship between the variables would be affected by the sampling procedure, whether CGs for demented or nondemented older adults were assessed and whether adult children or spousal CGs were studied.

METHODS

Sample

Studies were identified from the developmental and gerontological literature through electronic databases (Psycinfo, Medline, and Psyn dex, using the search terms [*caregiving* or *caregivers* or *carer* or *support provider*] and [*elderly* or *old age*]) and browsing through library shelves. Criteria for inclusion of studies in the meta-analysis were as follows:

1. The studies were published in peer-reviewed journals.
2. Informal CGs of older adults were assessed.
3. Associations were reported as correlations or as statistical measures that could be converted to correlations.

About one quarter of the total number of publications surveyed had to be eliminated, for the most part because insufficient information about the magnitude of relationship (zero-order effect sizes) between variables had been reported. Most of these studies reported multivariate analyses exclusively. In addition, a small number of studies from nursing journals did not report statistical test results. After exclusion of such studies, we were able to include 228 articles in the meta-analysis. The majority of these were from English-language journals; only 4 German articles, 1 Dutch paper, and 1 Spanish paper were used. The majority of articles were from the *Gerontologist* (36); others were from *Psychology and Aging* (26), the *Journals of Gerontology* (21), the *International Journal of Aging and Human Development* (8), the *Journal of Applied Gerontology* (7), the *Journal of Gerontological Social Work* (7), the *International Journal of Geriatric Psychiatry* (7), *Family Relations* (5), *Aging & Mental Health* (5), *Research on Aging* (4), and other journals (102). The studies we included were published between 1966 and summer 2002. Studies used in the meta-analysis are listed in the References and marked with an asterisk.

We entered the year of publication, the sample size, the sampling procedure (1 = probability sample, 0 = convenience sample), the type of illness of the CRs in each study (1 = dementia, 2 = physical illness, 3 = combination of mental and physically impaired adults), the percentage of CGs who were adult children and spouses, the measurement of the variables, and the correlations between the variables. If more than one study from the same author was available, we checked whether

these papers referred to different data sets. Five papers reported results from one data set but for different variables (e.g., one investigating burden and one depression). In this case, we included both papers in our analysis but omitted duplicate results. If statistical effects were provided for several subgroups in a publication (e.g., for adult children and spousal CGs), we entered these into our analysis instead of entering the global association measures.

Measures

CG burden was most often assessed with the Caregiver Burden Interview (Zarit et al., 1980; 58 studies); other studies used single-item indicators (10 studies), the Perceived Stress Scale (S. Cohen, Kamarck, & Mermelstein, 1983; 10 studies), the Screen for Caregiver Burden (Vitaliano, Russo, Young, Becker, & Maiuro, 1991; 8 studies), the Caregiver Strain Index (Robinson, 1983; 8 studies), Montgomery and Borgatta's caregiver burden scale (1989; 5 studies), and other scales (91 studies; 52 of the scales designed specifically for the study by combining or modifying items from the above scales). CG depression was most often assessed by the Center for Epidemiological Studies Depression Scale (CES-D; 57 studies). Other studies used the Beck Depression Inventory (15 studies), the Zung Depression Scale (8 studies), the Hamilton Depression Rating Scale (7 studies), the Geriatric Depression Scale (6 studies), and other measures (27 studies). Functional problems of the CR were assessed with ADL and IADL scales (99 studies), and cognitive problems were usually assessed with mental status questionnaires and short test batteries (78 studies; e.g., 26 studies used the Mini-Mental State Exam [Folstein, Folstein, & McHugh, 1975] and 7 studies used the Short Portable Mental Status Questionnaire [Pfeiffer, 1975]). Behavior problems of the CR were most often assessed by the original or revised Memory and Behavior Problems Checklist (Teri et al., 1992; 28 studies). CG involvement was assessed by the amount of care provided, that is number of hours per week (29 studies) and the number of caregiving tasks (e.g., help with toileting, cooking, etc.; 53 studies). Effects of the duration of care provision were assessed by correlations of the duration of caregiving (in months) with CG burden and depression (49 studies) and by longitudinal change of burden and depression across two points of measurement (15 studies). Measures of perceived uplifts of caregiving assessed satisfaction with caregiving (13 studies), enjoyable aspects of caregiving (5 studies), perceived gains (such as increased closeness with the CR; 3 studies), and a combination of these aspects (7 studies).

Statistical Integration of the Findings

The present meta-analysis is based primarily on the procedure of Rosenthal (1991). Meta-analytic calculations were performed in four steps.

Step 1.—The correlations were transformed using Fisher's *r*-to-*z* transformation.

Step 2.—We calculated the mean *z*, weighted by sample sizes. To compare the mean effect sizes with the effect sizes reported in the single studies, the mean effect size *z*s were later converted to the original metric of product-moment correlations. Because the Rosenthal approach originally did not

Table 1. Associations Between Levels of Care Receivers' Impairments, Support Provision, and Uplifts of Caregiving (Whole Sample)

Variable 1 and Variable 2	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	<i>Z</i>	Heterogeneity
Physical impairments						
Cognitive impairments	24	3,021	.43	.39–.47	25.13***	164.59***
Problem behavior	20	3,776	.27	.24–.31	17.08***	111.31***
Hours of care	8	3,034	.33	.29–.37	19.10***	46.38***
No. care tasks	9	4,219	.36	.33–.39	24.38***	43.50***
Months in CG role	12	2,321	–.03	–.07–.01	–1.27	30.66**
Uplifts	11	2,754	–.02	–.06–.02	–0.97	26.98**
Cognitive impairments						
Problem behavior	17	3,245	.31	.28–.34	18.20***	131.90***
Hours of care	4	789	.19	.12–.25	5.44***	14.24**
No. care tasks	5	827	.39	.32–.45	11.84***	101.52***
Months in CG role	11	1,531	.03	–.02–.08	1.21	24.90**
Uplifts	3	545	.03	–.05–.11	0.72	2.74
Problem behavior						
Hours of care	5	1,808	.15	.10–.20	6.34***	22.64***
No. care tasks	16	3,394	.24	.21–.27	13.83***	168.48***
Months in CG role	9	1,919	.04	–.01–.08	1.64	9.70
Uplifts	13	1,711	–.05	–.10–.01	–2.07*	52.54***
Hours of care						
No. care tasks	4	2,852	.29	.25–.33	15.79***	20.19***
Months in CG role	3	1,347	.00	–.04–.04	0.11	1.16
Uplifts	6	2,103	–.07	–.11–.03	–2.03*	25.69***
No. caregiving tasks						
Months in CG role	7	2,980	–.03	–.07–.00	–1.72	19.31**
Uplifts	10	2,803	.02	–.02–.06	0.93	24.47***
Months in CG role						
Uplifts	7	952	–.01	–.07–.05	–0.18	5.41

Notes: *k* = number of studies, *N* = number of participants, *r* = weighted mean correlation, C.I. = 95% confidence interval, *Z* = Test of the significance of the mean correlation, Heterogeneity = test of heterogeneity (significant values indicate heterogeneity of the effects); CG = caregiver.

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

include a procedure to compute confidence intervals, we used a formula suggested by Bushman and Wang (1995) to compute the 95% confidence interval of the mean correlation ($r \pm 1.96/\sqrt{N - 3k}$) with *N* = sum of participants and *k* = number of effect sizes).

Step 3.—To determine the significance of the mean effect size *z*, we computed a unit-normal distributed *Z* by dividing the sum of the weighted *z* values by the square root of the overall sample size. The difference in the correlation of variables between two conditions (e.g., association of burden with CRs' impairments in physical competence versus behavior problems) was considered significant when the confidence intervals did not overlap.

Step 4.—A chi-square measure was used to test the homogeneity of the effect sizes, based on the squared deviations of the individual effect sizes from the overall mean, weighted by sample size. In the tables, a significant chi-square value indicates that the effect sizes are heterogeneous.

RESULTS

Most studies were based on convenience samples (89%). About 42% of the studies investigated CGs of older adults with physical and mental impairments; others were exclusively

focused on CGs of demented elderly people (43.0%) and on other homogeneous samples (e.g., CGs of patients with cancer or Parkinson's disease; 14.9%). The CGs under investigation had the following characteristics. Their mean age was 59.5 years (*SD* = 7.8 years). Seventy-three percent were women. The majority were spouses (45.8%) and adult children (43.8%). Sixty-six percent shared the household with the CR. About half of the CGs were employed full time or part time (48.8%), and 69% had completed high school. About 17% of the respondents were members of ethnic minorities. The CGs had been providing care on average for 53.9 months (*SD* = 18.9) and for about 35 hr per week (*SD* = 25). In the studies that used the Caregiver Burden Interview (Zarit et al., 1980), the respondents had an average burden level of 29.9 (*SD* = 9.3). In studies that used the CES-D, the average level of depression was 11.5 (*SD* = 2.9).

The mean age of the care recipients was 75.7 years (*SD* = 5.1 years), and 61.4% were women.

Before investigating the outcomes of caregiving, we analyzed the intercorrelations between CR impairment, CG involvement, and uplifts of caregiving. As shown in Table 1, we found significant correlations between cognitive impairment, physical impairment, problem behavior, hours of care provided per week, and the number of caregiving tasks. The mean correlations ranged between .15 and .43. According to J. Cohen (1992), correlation coefficients of .10 have to be

Table 2. Bivariate Associations of Levels of Care Receivers' Impairments, Support Provision, and Uplifts of Caregiving With Caregiver Burden and Depression (Whole Sample)

Variable	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	<i>Z</i>	Heterogeneity
Associations with CG burden						
Physical impairments of CR	92	20,119	.22	.21-.23	30.91***	423.38***
Cognitive impairments of CR	76	14,495	.18	.16-.20	22.20***	210.80***
Behavior problems of CR	85	15,063	.37	.35-.39	47.22***	499.76***
Hours/week provided care	31	10,900	.22	.20-.24	23.46***	138.81***
No. care tasks	55	16,766	.24	.22-.26	31.08***	343.71***
No. months in CG role	59	11,048	.06	.04-.08	2.86**	179.69***
Uplifts of caregiving	24	4,415	-.16	-.19-.13	-10.83***	103.23***
Associations with CG depression						
Physical impairments of CR	50	8,565	.14	.12-.16	12.77***	132.03***
Cognitive impairments of CR	37	5,939	.16	.13-.19	12.24***	81.96***
Behavior problems of CR	51	6,525	.27	.25-.29	22.54***	106.59***
Hours/week provided care	17	1,511	.19	.14-.24	7.24***	42.70***
No. care tasks	23	4,334	.12	.09-.15	8.09***	36.46*
No. months in CG role	31	3,602	.07	.04-.11	3.27**	93.09***
Uplifts of caregiving	11	1,086	-.17	-.23-.11	-5.70***	42.84***
CG burden	77	13,629	.43	.41-.45	53.46***	606.29***

Notes: *k* = number of studies, *N* = number of participants, *r* = weighted mean correlation, C.I. = 95% confidence interval, *Z* = test of the significance of the mean correlation, Heterogeneity = test of heterogeneity (significant values indicate heterogeneity of the effects), CG = caregiver, CR = care receiver.

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

interpreted as small; .30, medium; and .50, large. In contrast, the duration of caregiving and the number of perceived uplifts of caregiving were not correlated with CR impairment or amount of caregiving, except that more CR behavior problems and performing more hours of care had significant inverse, although very weak, associations with more perceived uplifts.

Associations With CG Burden and Depression

In our first research question, we tested whether there would be a strong association of behavior problems of the CR with CG burden and depression and a small to medium association of physical impairments, cognitive impairments, amount of care provision, and perceived uplifts with CG burden and depression. As shown in Table 2, more CR behavior problems were associated with greater CG burden and depression, although the magnitude of the associations is medium rather than large. In support of our expectations, we found small, significant, and positive correlations of CG burden and depression with physical and cognitive impairment of the CR, the hours of care provided per week, the number of caregiving tasks, and negative correlations with perceived uplifts. Although the duration of caregiving was positively correlated with CG burden and depression, these correlations were very small.

We compared the magnitude of relationships between variables. When 95% confidence intervals do not overlap, the relationships are significantly different from one another (Bushman & Wang, 1995). CR behavior problems were more strongly related to CG burden and depression than all other variables. In addition, duration of caregiving showed weaker associations with both outcomes than any other variable.

The bivariate analysis of correlates of CG burden and depression does not take into account that the aspects of CR's impairment and CG involvement are moderately correlated (see Table 1). To control for such intercorrelations, the data were subjected to a multiple linear regression analysis. Because the intercorrelations were based on different sample sizes, we had

to use the average sample size for this analysis. Due to the fact that most bivariate effect sizes showed some heterogeneity, the multivariate results have to be interpreted with caution. As shown in Table 3, more CR behavior problems, more caregiving hours per week, fewer perceived uplifts of caregiving, and longer duration of caregiving were associated with greater CG burden and depression. In addition, performing more caregiving tasks and greater physical impairment of the CR were related to more burden, but not to more depression. In the multivariate analysis, associations between cognitive impairments of the CR and CG burden and depression were not significant. The variables explained 28% of the variance of CG burden and 13% of the variance of depression.

The Influence of Moderator Variables

All reported statistical effects were heterogeneous except the associations of the duration of caregiving with cognitive impairments, problem behavior, and hours of care provision and the association of cognitive impairments with uplifts. When effects are heterogeneous, moderator variables that influence the size of the observed relationship must be taken into account. In our second research question, we examined whether the size of the correlation is influenced by the sampling procedure, by the type of illness of the CR, and by whether the CGs are spouses or adult children.

We had expected that in probability samples associations of CR's impairments and amount of care provided by the CG would be stronger than in convenience samples. Note that only a small number of studies with probability samples were available for the present analysis. As shown in Table 4, our hypothesis received partial support by the data. CG burden was more strongly related to CR's physical impairments and to number of CG tasks in probability samples than in convenience samples. In addition, perceived uplifts were associated with less burden in convenience samples, but not in probability samples. Finally, a stronger association between CG burden and

depression was found in probability samples than in convenience samples. No other differences were significant.

Next, we investigated whether the associations with CG burden and depression would vary by the types of illness of the CR. We compared dementia CGs to CGs of nondemented (physically impaired) older adults (e.g., patients with cancer, hip replacement, pulmonary disease, fractures) and to mixed samples of CGs. First we examined the interrelationship of burden and depression. The association between CG burden and depression was stronger among dementia CGs than among mixed CGs and among CGs for nondemented adults. Furthermore, the two outcome variables were more closely related for mixed CGs than in CGs for nondemented older adults. CG burden and depression shared 27% of variance in dementia CGs, but only 22.1% of variance in mixed CGs and 14.4% of variance in CGs for nondemented older adults.

We had expected that CG burden and depression would be more strongly associated with cognitive impairments and behavior problems for dementia CGs and mixed CGs than for CGs of physically frail elderly persons. In addition, we had expected that physical impairment and amount of care provided would be more closely related to CG burden and depression for CGs of nondemented older adults than for CGs of demented older adults and for mixed CGs. These hypotheses were supported for CG depression, but not for CG burden (Table 5).

CRs' physical impairments.—Depression was more closely related to CRs' physical impairment for individuals caring for physically impaired people than for those caring for older adults with dementia and for mixed CGs.

CRs' cognitive impairments.—Depression was more strongly related to CRs' cognitive impairment for mixed CGs than for CGs of physically impaired older adults.

CG involvement.—Among CGs for physically impaired older adults, depression was more closely linked to the amount of caregiving per week than among mixed CGs. CG burden was more closely linked to the number of hours of caregiving among CGs for demented older adults than among mixed CGs. In addition, we found a stronger inverse relationship between uplifts of caregiving and CG burden in dementia CGs and mixed CGs than in CGs of physically impaired older adults.

We had sufficient data to compute a multivariate regression analysis for the subsamples of dementia CGs and mixed CGs (Table 3). As shown by the nonoverlap of the 95% confidence intervals, CRs' cognitive impairment and CGs' perceived uplifts of caregiving were less strongly related to burden for mixed CGs than for dementia CGs. In contrast, the number of caregiving tasks was more closely related to CG burden and depression in mixed CGs than in dementia CGs.

In the final step we investigated whether the observed associations with CG burden and depression would vary between spouses and adult children. We had expected spouses to be more distressed by CRs' physical impairments than adult children. As shown in Table 6, this hypothesis was supported with regard to CG burden but not depression: We found stronger associations of burden with CRs' physical impairment and behavior problems for spouses than for adult children. In

Table 3. Multivariate Associations of Caregiver Burden and Depression With the Levels of Care Receivers' Impairments, Support Provision, and Uplifts of Caregiving (Multiple Linear Regression Analysis)

	Whole Sample			Dementia Caregivers			Mixed Caregivers			
	Caregiver Burden		Caregiver Depression	Caregiver Burden		Caregiver Depression	Caregiver Burden		Caregiver Depression	
	β	C.I.	β	C.I.	β	C.I.	β	C.I.		
Physical impairments of CR	.06***	-.02-.09	.02	-.02-.06	.00	-.06-.06	-.08	-.17-.01	.02	-.03-.07
Cognitive impairments of CR	.02	-.01-.06	.01	-.03-.05	.12***	.06-.18	.15**	.06-.24	-.07***	-.11-.03
Behavior problems of CR	.29***	.26-.32	.25***	.21-.29	.26***	.20-.32	.29***	.21-.37	.32***	.29-.35
Hours/week provided care	.10***	.07-.13	.12***	.08-.16	.15***	.09-.21	.04	-.04-.12	.15***	.12-.18
No. care tasks	.16***	.12-.20	-.02	-.06-.02	.05*	.00-.10	-.12***	-.19-.05	.17***	.14-.20
Months in CG role	.06***	.03-.09	.06***	.03-.09	-.01	-.06-.04	.12**	.05-.19	.07**	.04-.10
Uplifts of caregiving	-.25***	-.28-.22	-.15***	-.18-.12	-.26***	-.30-.22	-.17***	-.23-.11	-.10***	-.13-.07
R ²	.28		.13		.24		.14		.20	
N	3,418		2,069		1,434		840		3,628	
										1,696

Notes: C.I. = 95% confidence interval, CR = care receiver, CG = caregiver.

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

Table 4. Moderating Effects of the Representativeness of the Sample on the Association of Care Receiver's Impairments, Care Provision, and Uplifts With Caregiver Burden and Depression

Associations	Probability Samples						Convenience Samples						Significant Difference Between Groups
	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	<i>Z</i>	Heterogeneity	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	<i>Z</i>	Heterogeneity	
With CG burden													
Physical impairments of CR	14	8,011	.26	.24 .28	24.01***	120.44***	78	12,108	.18	.16 .20	20.30***	265.29***	P > C
Cognitive impairments of CR	6	3,880	.19	.16 .22	11.78***	4.43	70	10,615	.18	.16 .20	18.94***	188.50***	
Behavior problems	15	5,277	.36	.34 .38	24.19***	68.95***	70	9,786	.39	.37 .41	40.83***	194.62***	
Hr/week provided care	7	5,793	.21	.19 .23	16.26***	81.69***	24	5,107	.23	.20 .26	16.97***	55.61***	
No. care tasks	10	7,527	.29	.27 .31	25.42***	189.17***	46	9,515	.19	.17 .21	18.88***	111.48***	P > C
Months in caregiver role	3	2,824	.03	-.00 .07	1.83	8.56*	56	8,224	.07	.05 .09	6.18***	168.79***	
Uplifts of caregiving	2	1,730	-.02	-.07 .03	-1.01	9.31**	22	2,685	-.25	-.29 -.21	-13.07***	35.99*	P > C
With CG depression													
Physical impairments of CR	9	3,279	.12	.09 .16	6.99***	33.00***	41	5,286	.15	.12 .18	10.80***	97.27***	
Cognitive impairments of CR	5	1,544	.18	.13 .22	6.98***	7.28	33	4,446	.15	.12 .18	10.28***	74.56***	
Behavior problems	5	1,686	.27	.22 .31	11.40***	3.84	46	4,839	.28	.25 .31	19.62***	102.31***	
Hr/week provided care	1	204	.15	.01 .28	2.09*	—	16	1,307	.19	.13 .25	7.01***	42.14***	
No. care tasks	4	1,392	.07	.02 .13	2.62**	2.43	20	3,196	.15	.11 .19	8.65***	28.91	
Months in caregiver role	4	2,549	.04	-.02 .10	1.27	7.91*	27	2,549	.09	.04 .13	4.46***	83.40***	
Uplifts of caregiving	— ^a	—	—	—	—	—	11	1,086	-.17	-.23 -.11	-5.70***	42.84***	
CG burden	6	3,936	.49	.46 .52	33.44***	20.09**	72	9,794	.43	.42 .45	45.02***	395.73***	P > C

Notes: *k* = number of studies, *N* = number of participants, *r* = weighted mean correlation, C.I. = 95% confidence interval, *Z* = test of the significance of the mean correlation, Heterogeneity = test of heterogeneity (significant values indicate heterogeneity of the effects). P > C indicates a stronger effect in probability samples than in convenience samples. CG = caregiver, CR = care receiver.

^aNo studies were available on this association.

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

addition, we found a positive association between duration of caregiving and burden in spousal but not in child CGs.

DISCUSSION

In the present meta-analysis, we analyzed associations of CR impairments, caregiving involvement, and caregiving uplifts with CG burden and depression. CG burden and depression were most strongly associated with behavior problems of the CR, followed by perceived uplifts of caregiving (inversely) and the amount of care provision. However, the strength of the observed relationships varies between representative versus non-representative samples, between CGs of demented versus non-demented older adults, and between spousal CGs versus caregiving children for several of the variables. We begin the discussion with comparisons of the size of the relationship of burden and depression with CRs' impairments and caregiving involvement. Because in a large meta-analysis very small effects may be statistically significant without having theoretical or practical importance, only those effects are interpreted that are at least of small size (*r* = .10; J. Cohen, 1992).

Variables Associated With CG Burden and Depression

Consistent with previous qualitative reports (e.g., Bédard et al., 2000; Schulz et al., 1990, 1995), we find that behavior problems of the CR are consistently associated with CG burden and depression. In addition, CR behavior problems play a larger

role in caregiving outcomes than do physical and cognitive impairments of the CR, thus indicating that CGs tolerate physical limitations and cognitive deficits better than CR behavior problems. Although it is possible that the measures of burden and behavior problems overlap conceptually because measures of behavior problems often weight CRs' disturbed behavior with the tolerance of these symptoms by the CG (Teri et al., 1992; Zarit, Todd, & Zarit, 1986), this overlap does not explain the fact that behavior problems also have larger associations with CG depression than do CR functional and cognitive impairments. Thus, other explanations must be taken into consideration, for example, the fact that CRs' bizarre and aggressive behavior may upset the CG and that CGs may feel helpless in the face of severe CR behavior problems (e.g., Ory et al., 2000).

The caregiving literature has been equivocal regarding the association of physical and cognitive impairments of the CR with CG burden and depression (Schulz et al., 1990, 1995). Our analysis demonstrates that there is a significant bivariate relationship between these variables, but that the relationship is small. Because greater impairments of the CR increase the amount of care provision (Table 1), associations of physical and cognitive impairments with CG burden and depression are, in part, nonsignificant in multivariate analyses.

Schulz et al. (1995) reported inconsistent results regarding the association between caregiving hours and CG burden and depression. Our analysis sheds light on this issue, as it is based on a larger number of empirical studies: The more assistance the CG provides, the more burden and depression he or she

Table 5. Moderating Effects of Care Receiver's Illness on the Association of Care Receiver's Impairments, Care Provision, and Uplifts With Caregiver Burden and Depression

Variable	Caregivers of Dementia Patients					Caregivers of Mixed Patients					Caregivers of Nondementia Patients							
	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	Heterogeneity	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	Heterogeneity	<i>k</i>	<i>N</i>	<i>r</i>	C.I.	Heterogeneity			
Caregiver burden																		
Functional impairments of CR	38	3,990	.24	.19	.28	101.13***	43	14,549	.21	.19	.23	301.01***	11	1,580	.21	.16	.26	18.51*
Cognitive impairments of CR	48	5,120	.16	.13	.19	92.49***	25	9,010	.20	.18	.22	106.63***	3	365	.22	.13	.32	10.53**
Behavioral problems of CR	59	7,457	.39	.37	.41	410.15***	26	7,606	.35	.33	.37	169.22***	—	—	—	—	—	—
Hr/week care	6	516	.31	.24	.38	25.61***	21	10,041	.22	.20	.24	104.98***	4	343	.30	.19	.41	0.61
No. care tasks	13	2,015	.21	.17	.25	46.33***	34	13,592	.24	.22	.26	294.92***	9	1,435	.25	.20	.30	8.02
Months in CG role	35	3,564	.06	.03	.09	85.56***	18	6,902	.06	.04	.09	61.86***	8	667	-.03	-.11	.04	37.44***
Uplifts of caregiving	7	975	-.30	-.36	-.24	8.09	15	3,202	-.13	-.16	-.10	74.35***	2	238	-.10	-.23	.03	3.87
Caregiver depression																		
Functional impairments of CR	18	2,616	.14	.10	.18	26.53*	23	5,104	.12	.09	.15	81.84***	9	845	.25	.18	.32	12.70
Cognitive impairments of CR	20	2,392	.12	.08	.16	31.03*	14	3,454	.19	.16	.22	37.31***	4	144	-.03	-.20	.14	1.98
Behavioral problems of CR	34	3,602	.28	.25	.31	48.32*	14	2,486	.28	.24	.32	53.08***	2	391	.16	.07	.25	22.97***
Hr/week care	6	399	.14	.04	.24	2.12	8	720	.14	.06	.21	29.02***	3	492	.33	.24	.41	1.00
No. care tasks	5	670	.04	-.04	.11	4.42	11	2,526	.12	.08	.16	16.36	6	828	.18	.11	.25	6.22
Months in CG role	12	956	.12	.06	.19	51.82***	14	2,198	.05	.01	.09	41.41***	5	448	.08	-.01	.17	15.53***
Uplifts	4	284	-.18	-.30	-.06	17.66***	5	533	-.26	-.35	-.19	10.26*	2	269	.01	-.11	.13	0.43
CG burden	37	4,988	.47	.44	.55	170.91***	25	6,397	.46	.44	.48	331.67***	16	2,345	.38	.34	.42	55.70***

Notes: *k* = number of studies, *N* = number of participants, *r* = weighted mean correlation, C.I. = 95% confidence interval, Heterogeneity = test of heterogeneity (significant values indicate heterogeneity of the effects), CG = caregiver, CR = care receiver.

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

experiences. According to J. Cohen's criteria (1992), the associations we obtained are small. A power analysis reveals that between 65 (for number of caregiving tasks with CG burden) and 250 participants (for number of caregiving tasks with depression) would be needed to identify the relationship between care provision and psychological outcomes as statistically significant (J. Cohen, 1992). Previous studies with small samples were not able to identify smaller effects, which explains much of the heterogeneity of previous qualitative reviews.

Linear associations between the duration of caregiving and caregiving outcomes were very small. This result may support the trait hypothesis. It may also indicate a nonlinear relationship of duration of caregiving and distress in which distress is greatest at the midpoint of care (Haley & Pardo, 1989). Unfortunately, in the present meta-analysis, we were not able to test for curvilinear relationships.

Perceived uplifts of caregiving, such as feeling useful or experiencing increased closeness to the CR, were associated with lower levels of CG burden and depression. This may indicate that uplifts reduce the negative effects of caregiving on psychological outcomes. However, because of the correlational nature of our data, we cannot rule out another interpretation: Distressed CGs may be less likely to perceive the positive aspects of caregiving. Interestingly, perceived uplifts were largely independent of objective caregiving stressors. Thus, uplifts are probably rooted in other aspects of the CG-CR relationship, such as mutual closeness (Walker, Shin, & Bird, 1990), CGs' motivation (Motenko, 1989), or CG personality (Hooker, Monahan, Bowman, Frazier, & Shifren, 1998; Kramer, 1997).

CRs' impairments and CG involvement have a stronger effect on CG burden than on depression. This result indicates that CG burden measures caregiving-specific psychological distress, whereas the presence of depressive symptoms suggests low levels of general subjective well-being and is influenced by many variables that are not dependent on the caregiving experience (Blazer, 1993).

The Influence of Moderator Variables

We had suggested that part of the heterogeneity of previous results may be due to sample characteristics, such as the sampling procedure, the type of illness of the CR, and characteristics of the CG.

Sampling procedure.—Associations of CG burden with CRs' physical impairments, the number of caregiving tasks, and uplifts (inversely) are stronger in probability samples than in convenience samples. Because convenience samples are often limited to highly distressed CGs, the lower correlations in these samples may be the result of restricted variance of the outcome variables (Schulz et al., 1990). For example, for studies that use the Caregiver Burden Interview, the standard deviation of burden is larger in probability samples (*SD* = 14.72) than in convenience samples (*SD* = 13.92), $F(1,5729) = 31.32$, $p < .001$.

Type of CRs' illness.—The levels of physical impairment and the number of caregiving hours had the strongest associations

Table 6. Associations of Care Receiver’s Impairments, Care Provision, and Uplifts With Caregiver Burden and Depression in Spousal Caregivers and Caregiving Adult Children

Associations	Spouses						Adult Children						Significant Difference Between Groups		
	<i>k</i>	<i>N</i>	<i>R</i>	C.I.	<i>Z</i>	Heterogeneity	<i>K</i>	<i>N</i>	<i>r</i>	C.I.	<i>Z</i>	Heterogeneity			
With CG burden															
Physical impairments of CR	14	1,848	.29	.25	.33	12.85***	101.21***	9	1,402	.20	.15	.25	7.86***	19.84*	S > AC
Cognitive impairments of CR	12	822	.12	.05	.19	3.70***	10.19	6	598	.19	.11	.26	4.74***	20.45**	
Behavior problems	15	1,311	.40	.35	.46	15.33***	47.97***	8	1,392	.31	.26	.35	12.04***	16.33*	S > AC
Hr/week provided care	4	234	.26	.14	.38	4.16***	4.58	6	1,179	.21	.16	.26	7.39***	14.48*	
No. care tasks	5	1,194	.32	.26	.37	11.34***	31.63***	11	1,961	.26	.22	.30	11.82***	19.53*	
Months in caregiver role	15	1,136	.15	.09	.21	5.11***	60.42***	4	365	-.14	-.24	-.04	-2.76**	1.13	S > AC
Uplifts of caregiving	3	341	-.12	-.01	-.23	-2.22*	5.82	4	848	-.04	-.11	.03	-1.30	32.98***	
With CG depression															
Physical impairments of CR	9	1,338	.15	.09	.19	5.35***	2.34	1	149	-.04	-.20	.12	-0.49	—	
Cognitive impairments of CR	3	370	.10	-.01	.20	1.83	0.56	2	193	.08	-.06	.22	1.11	1.82	
Behavior problems	11	1,066	.28	.22	.34	9.43***	8.73	3	230	.37	.25	.48	5.88***	25.20***	
Hr/week provided care	6	291	.08	-.04	.20	1.41	2.98	3	301	.15	.04	.25	2.52*	0.36	
No. care tasks	7	1,568	.08	.03	.13	3.33**	3.60	2	599	.08	-.00	.16	1.95	0.10	
Months in caregiver role	11	724	.09	.01	.16	2.36*	41.61***	3	436	.06	-.03	.15	1.26	4.97	
Uplifts of caregiving	4	453	-.22	-.30	-.13	-4.70***	26.79***	2	233	-.17	-.29	-.04	-2.46**	0.28	
CG burden	22	2,661	.36	.32	.40	19.49***	221.47***	6	1,373	.34	.29	.39	13.06***	14.39*	

Notes: *k* = number of studies, *N* = number of participants, *r* = weighted mean correlation, C.I. = 95% confidence interval, *Z* = test of the significance of the mean correlation, Heterogeneity = test of heterogeneity (significant values indicate heterogeneity of the effects). S > AC indicates a stronger effect in spouses than adult children. CG = caregiver, CR = care receiver.

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

with CG depression in CGs for physically frail older adults, whereas cognitive impairments and perceived uplifts of caregiving showed the closest association with depression in CGs for demented older adults. Perhaps nondemented older adults’ cognitive impairments are not severe enough to affect CGs’ mood (e.g., Dura, Haywood-Niler, & Kiecolt-Glaser, 1990). However, because physical impairments are often even greater in CRs with dementia than without dementia (e.g., Ory, Hoffman, Yee, Tennstedt, & Schulz, 1999), the observed stronger association of CR physical impairment with depression in nondementia CGs cannot be explained by a relative lack of these impairments in demented CRs. Rather, in the case of severe behavior problems and cognitive problems found in demented older adults, physical impairments may be of secondary importance in predicting psychological distress of CGs. In fact, when CRs’ have severe behavior problems, such as wandering and getting lost, greater physical impairments may even reduce CG stress (e.g., Gräbel & Leutbecher, 1993).

CRs’ illness does not moderate the association of CG burden with severity of CRs’ impairments and amount of care provided, probably because some studies used illness-specific measures of CG burden that were difficult to compare. For example, studies on caring for physically impaired adults often measure burden by assessing the impact of caregiving on other social roles (e.g., Cameron, Franche, Cheung, & Stewart, 2002), whereas studies on dementia caregiving often ask for CGs’ negative reactions toward CR behavior problems (e.g., embarrassment; Zarit et al., 1980).

Spouses versus adult children.—Physical impairments and behavior problems of the CR and a longer duration of care provision show stronger associations with CG burden in spousal CGs than in adult children. Because spousal CGs

often suffer from age-associated chronic illness, providing care is more difficult than for adult children when care needs increase (Connell et al., 2001; Schneider et al., 1999). In addition, adult children are more likely than spouses to have alternative roles and social activities outside the home that might function as a buffer against severe and long-lasting CG stress (Barber & Pasley, 1995; Reid & Hardy, 1999; Stephens et al., 1994). Lack of differences between spouses and adult children for associations with CG depression are probably due to the small number of available studies.

LIMITATIONS AND CONCLUSIONS

The present article has several limitations. First, because most bivariate effect sizes were heterogeneous, the multivariate analyses have to be interpreted with caution. In addition, too few studies were available to compute multivariate analyses for some subgroups (e.g., CGs for physically impaired older adults). Second, because our analysis is based primarily on correlational data, we could not test causal relations between the variables. Third, the size of the associations with CG burden and depression may also be influenced by other sample characteristics, such as CG gender. However, we did not have a sufficient number of studies for such subanalyses. Fourth, when comparing dementia CGs with nondementia CGs or caregiving spouses with adult children, it is important to recognize that these groups may differ on other variables. For example, mixed CG samples included a smaller number of spousal CGs (38%) than samples of dementia CGs (59%) and CGs for physically impaired older adults (64%). Fifth, the present meta-analysis was focused on associations with CR impairments, CG involvement, and perceived uplifts. Other variables that have also been related to the level of CG burden and depression must be addressed in future work, such as age

(Schulz et al., 1990) and ethnicity (e.g., Knight, Silverstein, McCallum, & Fox, 2000).

Conclusions

Despite these limitations, we were able to integrate otherwise contradictory findings and estimate the average size of the relationships between CR impairment and CG involvement and uplifts on the one hand and burden and depression on the other. Several conclusions can be drawn from the present study with regard to expected caregiving effects, future research, and needs for intervention.

First, with regard to developing explanatory models of caregiving effects, we conclude that CGs are most burdened by CR behavior problems, although physical and cognitive impairments of the CR and the amount of care provision contribute to CG distress as well. Second, because according to J. Cohen's (1992) criteria the associations with caregiving outcomes were only small to moderate, we conclude that moderator variables may influence the size of the relationship between caregiving demands and caregiving outcomes, such as coping processes (e.g., O'Rourke & Wenaus, 1998) and CG's receipt of social support (e.g., Kaplan & Boss, 1999). Third, we conclude that part of the heterogeneity of previous results can be explained by differences in sample characteristics, such as whether CGs are providing assistance to older adults with or without dementia and whether they are spouses or adult children.

Four conclusions can be drawn regarding future research needs. First, large, population-based studies are needed to reduce bias in the results. Because convenience samples are often relatively homogeneous with regard to CG distress, amount of care provision, and CR impairment, they tend to underestimate the size of associations between variables due to restricted variance. In addition, studies with large samples would enable the detection of small and medium effect sizes, which are often overlooked in smaller studies. Second, longitudinal studies are needed that relate changes of CR impairments and CG involvement with changes in psychological outcomes (e.g., Aneshensel et al., 1995) and identify nonlinear changes in caregiving outcomes. Third, because in the present study heterogeneity of effect sizes remains unexplained, we conclude that further research is needed regarding other moderator variables, such as CG gender, ethnicity, and coping. Fourth, the quality of data analysis and publication of caregiving studies would be greatly improved if a full correlation matrix of the variables is provided. Similarly, in order to compare psychological effects of caring for demented versus nondemented older adults, more high-quality research on nondementia caregiving is needed. For example, because of comorbidity, studies on CGs for persons with illness other than dementia (e.g., cancer) should screen for CRs' cognitive impairment and report separate results for physically impaired adults *versus* older adults who are both physically and cognitively impaired.

With regard to psychosocial interventions for CGs, we conclude that, first and foremost, interventions that reduce behavior problems of the CR and increase CGs' skills in handling behavioral difficulties are needed. Such interventions may teach behavior management techniques and educate CGs about the unintentionality and pathology of these behaviors

(e.g., Teri, Logsdon, Whall, Weiner, Peskind, & Thal, 1998). Second, because we did not find much evidence that perceived uplifts of caregiving may be eroded when the objective level of stress increases, psychosocial interventions might also focus on strengthening perceived uplifts of caregiving, for example, by cognitively restructuring caregiving perceptions, strengthening positive aspects of the CG-CR relationship, and promoting appreciation by other family members (Gitlin et al., 2001). Third, because stronger associations between caregiving stressors and psychological outcomes were found in spouses than in adult children, we conclude that spouses may benefit more than other CGs from interventions that reduce the objective level of stressors, such as respite care and adult day care (e.g., Zarit, Stephens, Townsend, & Greene, 1998).

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