Parental disability, parent care, and offspring mental health outcomes

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Abstract Decades of research supports a widely held view that providing parent care is stressful, and that these stresses are associated with adverse mental health outcomes. However, some recent studies suggest an additional possibility, namely that “noncaregiver stress”—a consequence of having a parent with major care needs, but not being an active caregiver—may be a serious problem as well. This finding emerges in data which permit separate controls for parental *needs* for care and offspring *provision* of parent care. We extend these results using Generations and Gender Programme data from five countries—Bulgaria, France, Georgia, Romania, and Russia—for which the necessary variables can be comparably measured. Our outcome variable is a depression score based on a 7-item scale. In country-specific regressions, we find two instances of statistically significant associations of depression with the regular provision of personal care to a parent with care needs, i.e., the usual “caregiver stress” result. However, we also find two instances of statistically significant differences in respondents’ depressive symptoms that are associated with having a parent with care needs, i.e., instances of “noncaregiver stress.” We find limited evidence of gender-specific responses to both forms of stress. Our evidence supports both the typical caregiver stress response

and the less-studied noncaregiver stress response, which suggests the need for additional research.

Keywords Informal care · Caregiver stress · Parent care · Comparative study

Even in countries that maintain a strong social-care sector, family members play a significant role in the provision of care to older people (Haberkern and Szydlik 2010). This “informal” care provides benefits to those who receive it, and may also produce wider social benefits by easing demands on publicly funded services. However, much of the literature suggests that caregiving has negative implications for the well-being of the caregivers themselves. Indeed, much research supports the view that the stresses of providing parent care are associated with adverse mental and physiological health outcomes. Nevertheless, some recent studies suggest that having a parent with major care needs, while *not* being an active caregiver, may also be a source of stress. Findings such as these rest on an expanded model of the consequences of family caregiving, and require data which permit separate controls for parental care needs and adult offspring provision of parent care.

Data suitable for testing the expanded caregiver stress process model are, in general, rare. However, the Generations and Gender Programme (GGP)’s Wave One questionnaires for five of the GGP countries—Bulgaria, France, Georgia, Romania, and Russia—contain such data. We use data from these five countries to estimate multivariate models of depression, contrasting “caregivers” (those providing care to a parent that has care needs) and “noncaregivers” (those not providing care to a parent, despite the fact that their parent has care needs) to a reference group, those whose parents are alive but are without

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reported care needs, i.e., a group “not at risk” for caregiving. The type of care measured in the GGP survey is “...regular help with personal care such as eating, getting up, dressing, bathing, or using toilets...”¹—that is, the more intensive and hands-on types of care most readily characterized as stressful and burdensome in the scholarly, practice, and public arenas.

Conceptual framework

For over two decades, the majority of research on informal care outcomes has been guided by a version of the stress process model specific to the informal caregiving situation (Pearlin et al. 1990). This model distinguishes among *primary stressors* (those associated with the care recipient’s needs), *secondary stressors* (such as family conflict), *mediators* (including coping strategies), and *outcomes* such as depression, anxiety, and adverse physical health. Schulz et al. (1990) list four categories of stressors associated with caregiving: extreme physical demands; financial burden; breakdown of established intra-family relationships; and the likelihood that “... one must watch a loved one decline and contemplate that person’s eventual death” (p. 181). Note that in the case of parent care, the latter two categories of stressors may be experienced by a child not actively involved in providing care; non-caregiving children may also experience financial stress if they contribute financially to market provided care for a parent or if they help to compensate a caregiving sibling.

Empirical research on caregiving for elderly family members overwhelmingly supports the predictions of the caregivers stress process model. A review by (Schulz et al. 1990) mentions 34 studies on the “psychiatric and physical morbidity effects of caregiving,” 22 of which included depression as a key outcome, and often as the only outcome, of interest. Pinquart and Sörensen’s (2005) meta-analysis synthesized 98 studies of depression, concluding that the differences in depression between caregivers and those not providing care are large and statistically significant. Other negative consequences of being a caregiver that appear in the literature include reduced immune-system responses (Kiecolt-Glaser et al. 1996), an increase in the number of chronic conditions and lower self-rated health (Pinquart and Sörensen 2007), health risk factors such as poorer nutrition and reduced exercise (Burton et al. 1997), and excess mortality (Christakis and Allison 2009).

The caregiver stress process model acknowledges the possibility of “... conflict between caregivers and other

family members...” (Pearlin et al. 1990, p. 588), which is likely to be a source of stress. Others have noted that someone’s need for care has effects that “... radiate throughout all lives interlinked ...” to that needy person (Gatz et al. 1990, p. 416). Nevertheless, empirical research on health outcomes among non-caregiving family members is rare. Amirkhanyan and Wolf (2003, 2006) present evidence that “noncaregivers”—people who report that their parent has care needs but do not provide care to the needy parent—may exhibit depressive symptoms analogous to those manifested among active caregivers. Prompted in part by the Amirkhanyan and Wolf findings, Schulz et al. (2007) proposed a broadened conceptual framework for studying family caregiving, one that recognized a direct pathway running from the patient’s (i.e., the care recipient’s) suffering to a non-caregiving family member’s psychiatric and physical health. Schulz et al. suggested that the psychological mechanism responsible for this direct effect—i.e., for what Amirkhanyan and Wolf (2003) called “noncaregiver stress”—could include “mood contagion” or “convergence”—that is, a “spillover” or “crossover” effect that transmits depressed mood from one family member to another (Wethington 2000). A non-caregiving child could also suffer mental distress as a consequence of feeling guilty about the fact that they are, whether by choice or circumstance, uninvolved in care provision. There is growing recognition of the possibility that individuals may suffer adverse consequences of a family member’s declining health or need for care (Eisenberger 2013), and several recent studies have provided additional evidence that supports this possibility (Hansen and Slagsvold 2013; Freedman and Carr 2014). Bobinac et al. (2010) include only caregivers in their study but distinguish between a “family effect” (which results from caring *about* other people, and therefore could be experienced by non-caregivers) and a “caregiving effect.”

A direct causal pathway from a parent’s need for care to their adult child’s mental health could provide an explanation for the noncaregiver stress outcome reported in Amirkhanyan and Wolf (2003). At the same time, engaging in caregiving may produce any number of beneficial outcomes among caregivers, partially offsetting the negative direct effects of observing the care recipient’s suffering. Several studies point out that caregivers often derive satisfaction from their caring, even in combination with the feeling of being burdened (Lawton et al. 1991). Others have noted that caregiving “costs” are accompanied by “rewards” (Raschick and Ingersoll-Dayton 2004; Reidel et al. 1998), or that “hassles” are paired with “uplifts” (Kinney and Stephens 1989). These positive aspects of caregiving are often conceptualized as representing different underlying dimensions than the negative ones of stress and burden, suggesting that caregivers could

¹ See *Generations and Gender Survey Core Questionnaire for Wave 1* (http://www.ggp-i.org/images/stories/Survey_Instruments/GGP_QuestW1Core.pdf; Accessed Mar 6 2009), question 710.

simultaneously experience positive and negative consequences. A growing number of studies find that caregivers may, in some circumstances, enjoy net health benefits of their caregiving activities (Brown et al. 2009). For example, two recent studies based on UK census-based samples linked to mortality data found lower mortality risks for carers than for non-carers over a four-year period in Northern Ireland (O'Reilly et al. 2008) and a nine-year follow-up in England and Wales (Ramsay et al. 2013). The Northern Ireland study attributed this in part to a “healthy carer” selection effect, arguing that people in poor health were unlikely to be able to take on substantial caregiving responsibilities. The England and Wales study found that carers providing less than 20 h of care per week had lower mortality despite initially higher rates of poor health.

Several papers have examined cultural factors in caregiving and in the caregiver stress process, although culture is often identified with race or ethnicity rather than with citizenship or national identity (Dilworth-Anderson et al. 2002). In cross-country comparisons and in reviews and syntheses of such studies (Janevic and Connell 2001; Torti et al. 2004), it has generally been concluded that caregiver stress and burden are remarkably consistent across countries, supporting the idea that a “common core model” applies across a range of cultural settings (Knight and Sayegh 2010).

Caregiving behavior and the caregiver-stress process associated with it are widely recognized to be strongly gendered phenomena. Women comprise the majority of informal caregivers across virtually all countries in which caregiving behavior has been measured (Lee 1999). One recent study showed that women are especially likely to provide intensive care—i.e., regular, weekly, care, in contrast to “sporadic,” or supplemental, care—throughout Europe (Schmid et al. 2012). Research has also demonstrated the existence of gender differences in stress reactivity (Schmaus et al. 2008), coping styles (Matud 2004), and in stress-induced depression (Piccinelli and Wilkinson 2000). For these reasons, we anticipate that there may be gender differences among both caregivers and those we categorize as “noncaregivers.”

Contextual factors

Besides personal factors, a number of contextual factors are likely to influence both whether someone becomes a provider of care to a parent and the implications of providing this care for the caregivers' own health and well-being. Overall levels of health and mortality in a particular population and personal and familial socio-demographic factors are likely to influence one's chances of becoming a caregiver, sometimes in offsetting ways. In higher

mortality populations the probability of having a living parent may be lower than in lower mortality populations, but so will be the probability of having only one living parent (most often a widowed mother) which may increase potential needs for assistance. Levels of poor health and disability are also likely to be higher in high mortality populations.

Of the five countries included in this analysis, four—Bulgaria, Georgia, Romania, and Russia—are transition countries that were formerly part of the Soviet Union or Eastern bloc. These countries have faced extensive upheavals since the collapse of the Soviet Union. Bulgaria, Romania, and Georgia in particular have seen extensive out-migration during this period and declines in population size. In Bulgaria, it has been estimated that there was a 10 % reduction in the size of the working age population between 1992 and 2011 (OECD 2012); in Georgia there was a 20 % decline in population between 1989 and 2002 (Badurashvili and Nadareishvili 2012). It has been estimated that about 5 % of the Romanian national budget in 2007 came from remittances (Horvath 2007), since when levels of emigration have increased even further. During the same period Russia has experienced emigration of highly educated and skilled workers to Western countries, but also in-migration of ethnic Russians from former Soviet Union countries (Nozhenko 2010). These emigration patterns might influence the balance of caregivers to noncaregivers if, for example, one member of a sibship remained in the country to provide care for a parent, perhaps with financial support from siblings who had emigrated for work. By contrast France, the fifth country included here, is a stable Western European country with much lower mortality and is a destination, rather than an origin country, for international migrants.

Selected contextual indicators for these five countries, taken from a number of sources, are displayed in Table 1. The Eastern European countries have much higher mortality than in Western European countries, as reflected in gender-specific life expectancy at age 65 [indicators (1) and (2) of Table 1]. Differences between male and female mortality are substantial, with differences in average remaining lifetime at age 65 ranging from 2.8 years (in Romania) to 4.3 years (in France). Indicators of population aging included in Table 1—median age and percentage of the population over 65 and over 80—also show differences. Although Bulgaria's population appears to be slightly older (judging by median age) than France's, the percentage of France's population that is over 80 is well above that of the other four countries studied here. The percentages of older women that are widowed [indicator (6)], an indicator of adult children's potential care burdens, are over 60 % in Bulgaria, Romania, and Russia, while only about 53 % in France.

Table 1 Selected country-level contextual indicators, various years

GGP survey year		Bulgaria 2004	France 2005	Georgia 2006	Romania 2005	Russia 2004
(1)	e ₆₅ , Male	13.3	17.8	14.1	13.4	11.1
(2)	e ₆₅ , Female	16.3	22.1	18.3	16.2	15.4
(3)	Median age, 2007	41.0	39.0	35.8	37.3	37.5
(4)	% of population 65 and older, 2007	17.3	16.2	14.6	14.9	14.0
(5)	% of population 80 and older, 2007	3.5	4.8	2.3	2.7	2.3
(6)	% widowed among women 70 and older, 2000	61.8	53.4	–	64.4	65.8
(7)	DALE, ^a 2007	66.0	73.4	64.4	65.3	60.1
(8)	<i>Proportion of ages 20–74 spent in good health</i>					
	Male	0.65	–	0.56	0.66	0.34
	Female	0.53	–	0.40	0.51	0.25
(9)	Real GDP, PPP\$, per capita ^b	8873	29,809	4044	9459	10,246
(10)	Total health expenditures (% of GDP)	7.3 %	11.1 %	8.4 %	5.5 %	5.2 %
(11)	Public-sector health expenditures as percentage of govt. expenditures	11.6 %	16.0 %	7.0 %	13.2 %	11.3 %
(12)	Nursing/elderly home beds per 100,000 ^b	55.8	627.7	6.2	93.8	15.2
(13)	Care of older needy persons should be...					
	...borne equally by society and family	39.3 %	42.1 %	17.7 %	21.8 %	35.8 %
	...borne more by family than by society	43.6 %	44.8 %	77.6 %	67.5 %	51.4 %

Sources: (1), (2), (7), (9)–(12) WHO's European Health for all database (<http://data.euro.who.int/hfadbf/>)

(3)–(5) Mamolo and Scherbov (2009), Tables B-2, B-3, and B-4

(6) Botev (2012), Table 2

(8) Minagawa (2013), Table 3

(13) Authors' calculations based on full GGP samples

^a Disability-adjusted life expectancy at birth

^b Gross domestic product in purchasing power parity equivalents

Differences in mortality are paralleled by differences in disability-adjusted life expectancy [DALE, indicator (7)] and the proportion of adult years spent in good health [indicator (8)]. Minagawa (2013), the source of indicator (8), points out that the residents of the countries of East Central Europe (represented here by Bulgaria and Romania) are in better health than those in the former Soviet Union (Georgia and Russia), while worse than those in the Western Europe (France, in this study).

The economic situations of these five countries are quite different, as are the allocation of resources to the health care sector. France is a much richer country than the others included, with much higher health care expenditure and greater provision of nursing home beds and home-delivered services [indicators (9) through (12) in Table 1]. Health care expenditure is particularly low in Georgia, which has also faced particular difficulties with restructuring following the Soviet legacy of over capacity of acute hospital beds but under provision of other services (Chanturidze et al. 2009). In all the Eastern countries, older people have also seen considerable reductions in the availability and level of pensions and other services (Velkoff and Kinsella

1993). In Georgia, for example, a social insurance system was introduced in the 1990s but later withdrawn, with a more recent emphasis on marketization of services (Chanturidze et al. 2009).

The final indicator shown in Table 1 reflects prevailing attitudes, and comes from the GGP data. Respondents were asked about their "... views on how we should care for people in our society." With respect to "care for older persons in need of care in their home" the response categories were "a task equally for both society and the family," "more a task for the family than for society," and "mainly a task for the family" (the latter two categories are combined in Table 1). What is most striking about these figures is the large majority of respondents in Georgia and in Romania who feel that elder care is a task primarily for the family.

Thus, while the conceptual framework discussed above is viewed as relevant across a variety of cultural and national settings, the particulars of the social, economic, demographic, and programmatic environments found in the five countries for which we have data are sufficiently different to suggest that each country's data should be separately analyzed.

Data

Sample

We use Wave 1 of the GGP's Generations and Gender Survey (GGS), which asks respondents to provide information about themselves, their parents, other household members such as their spouses or partners and children, and their social networks. At the time that we undertook this study, available samples from only five countries—Bulgaria, France, Georgia, Romania, and Russia—included all the data elements necessary for our analysis.² Response rates for these countries ranged from a low of 44.8 % in the Russian Federation to a high of 97 % in Romania; in France, Georgia, and Bulgaria the response rates were 66.3, 71.5, and 74.9 %, respectively (Fokkema et al. 2014). For more information about the GGS see Vikat et al. (2007). Data collection for Bulgaria and Russia occurred in 2004, for France and Romania in 2005, and for Georgia in 2006.

Our analytic samples are restricted to respondents that are potentially at risk for providing care to their parents. We exclude those whose parents are both deceased and the small proportion who report not knowing the whereabouts or status of the parent (effectively such a person is not “at risk” for providing care). We also excluded respondents aged less than 25 years of age. Applying these restrictions removed between 44 and 54 % of GGS respondents from our analysis. A handful of cases (67 from Bulgaria and 24 from Russia) were also dropped from the analysis due to missing variables. The sample sizes produced by these selection criteria are as follows: 7100 (Bulgaria), 5601 (France), 5075 (Georgia), 5860 (Romania), and 5115 (Russia).

Variables

Our dependent variable, a *depression* scale, aggregates each person's responses to seven survey items. Respondents were asked about their frequency of experiencing each of the following: they “... could not shake off the blues even with help from ... family or friends;” they felt depressed; they thought their “... life had been a failure;” they felt fearful; they felt lonely; they had crying spells; they felt sad. These items correspond to the Depressed Affect subscale of the original Center for Epidemiological Studies-Depression (CES-D) battery (Radloff 1977; Hansen and Slagsvold 2011). The response categories are *seldom or never*, *sometimes*, *often*, *or most or all of the time*,

coded 0, 1, 2, and 3, respectively. We add these seven responses, producing a scale ranging from zero to 21. This approach implicitly assumes that the distance from “seldom or never” to “sometimes” is the same as the distance from “sometimes” to “often,” and so on. It also gives equal weight to the mental states tapped by the unique wording employed in each survey item. Note also that all seven mental health scale items use language indicative of a depressed mood, thus ruling out the need for “reverse coding” of positively worded items as in some items included in the full CES-D scale. Hox et al. (2010) use factor analysis to investigate the internal reliability of this scale for the countries in our sample. They find that this is a reliable measure of the underlying depression construct (they report Cronbach's alphas that range from 0.885 in Romania to 0.911 in Bulgaria).

Our indicator of a parent's need for care uses the following survey item: “Is your mother (father) limited in her (his) ability to carry out normal everyday activities because of a physical or mental health problem or disability?” Those answering yes were classified as having a parent with care needs. The survey also asks each respondent, “Over the past 12 months, have you given people regular help with personal care such as eating, getting up, dressing, bathing, or using toilets?” Those who responded affirmatively were then asked to list up to five such care recipients, and those recipients were coded using relationship codes that distinguish “mother” and “father” from other possible recipients. Using these responses, we categorized each respondent into one of three mutually exclusive groups: a *caregiver* is someone who reports that their parent has care needs and the respondent provides care. A *noncaregiver* is someone who reports that their parent *has* care needs but who has *not* provided help with personal care to that person in the last 12 months. The third group—those “not at risk” of parental caregiving, which is the reference group in our regression models—consists of respondents with one or more living parents, none of which are reported to be limited in normal everyday activities. In addition to these controls for a parent's need for care, we control for parental survival (*father deceased* and *mother deceased*; having both parents alive is the reference group).

Our multivariate analysis also includes controls for other relevant factors. We include variables indicating *single* respondents and *divorced or widowed* respondents (with “married or partnered” as the reference group). Respondents were able to classify their health as very good, good, fair, bad, or very bad, which we used to create three dichotomous variables to capture the respondent's health—*good* (which combines good and very good and is the reference group in our regressions), *fair*, and *poor* (which combines bad and very bad). We also include four variables that represent potential sources of stress other than

² The other GGP countries for which GGP survey data were available at that time were Germany, Hungary, and the Netherlands. Subsequently, data for Australia, Austria, Belgium, Czech Republic, Estonia, Italy, Japan, Lithuania, and Poland have also been released.

those associated with a parent's care needs: an indicator that the respondent's *spouse or partner has care needs*, a variable indicating whether the respondent has *children* residing in the household, and indicators of the presence of *grandchildren* and of one or more *parents-in-law* in the household.

The GGP data include several measures of socioeconomic status, including education, household income, and occupational standing. Because the prevalence of missing information on education and income is relatively high, we use only the occupational standing variables. We follow Rose and Harrison (2010) and convert the respondent's occupational designation (which follows the International Classification Standards of Occupations 1988 codes) into low, medium, and high categories (with the medium level occupations used as the reference group). We use the respondent's previous occupational designation if no current designation exists, and those lacking a previous or current designation are coded as "not working" if they also indicated that they were not employed at the time of the survey. Finally, we control for the respondent's age (and age squared to capture any nonlinearities). We also created a variable that measures the age of the oldest living parent. However, this variable is missing for over seven percent of our sample, which prompted us to exclude the "age of oldest parent" variable from our multivariate analysis. Among the cases with complete parental age data, the correlation between the respondent's age and their oldest living parent's age ranges from 0.82 to 0.87, suggesting that relatively little unique explanatory power is lost through this exclusion.

Although the GGP data include information on distance to one's parents, we do not control for proximity because of concerns about possible endogeneity bias. Migration and location decisions of both elderly parents and their adult children may be influenced by the care needs, actual or anticipated, of the parents. But, the same sort of reverse-causality argument can be offered in our study: people with an aversion to caregiving, or who are on poor terms with their parents, or that have relatively lower resources, capacity, or skills for coping with stress, may be more likely to move away from where their parents live. Thus, "non-caregiver stress" could be a predictor of, as well as a consequence of, proximity to parents.

Statistical methods

The depression score used as the dependent variable in our analysis exhibits substantial skewness, a variance that greatly exceeds its mean, and a high proportion of responses that equal zero. In this situation, an appropriate statistical model is zero-inflated negative binomial

regression, or ZINB (Cameron and Trivedi 2013). The ZINB model in effect breaks the dependent variable into two parts, applying a logistic regression to the "extra zeros" part and a "deflated" negative binomial regression to the count part of the variable. For simplicity's sake, we present the multivariate results in the form of "marginal effects." In the ZINB model the expected value of the outcome can be represented as follows:

$$E[Y|X] = [1 - \text{logit}(XB_1)]\exp(XB_2), \quad (1)$$

where X is the array of explanatory variables and B_1 and B_2 are the two sets of regression coefficients that correspond to the two parts of the model. For purposes of calculating marginal effects, we substituted the mean of all explanatory variables except for the caregiver variable (CG) and the noncaregiver variable (NCG) into (1). We then evaluated (1) for values $CG = 0$ and $CG = 1$ (in both cases, with $NCG = 0$). The difference in the value of $E[Y|X]$ is the estimated effect on the depression score of being a caregiver, relative to the reference situation—someone whose parents do not need care, and who is not a caregiver—for an otherwise average person. An analogous procedure produces an estimate of the marginal effects for noncaregivers.

As discussed previously, there are several reasons to anticipate both country- and gender-specific caregiving behavior and mental health consequences of caregiving behavior. Therefore, we have estimated separate models for all combinations of country and gender. However, as will become apparent, small numbers of caregivers in the gender-specific subsamples may undermine our capacity to detect meaningful differences. Accordingly, we also present results from country-specific regressions in which males and females are combined; in the latter case we include a control for gender, but do not interact gender with any other explanatory variables.

Results

Table 2 provides summary statistics and sample sizes for our analytic samples, shown by country and gender. In all five countries, women have higher depression scores (indicating poorer mental health) and are more likely to report experiencing at least one depressive symptom (that is, women are less likely to score a zero). The proportion of respondents providing personal care to parents is low (0.02–0.03) and fairly similar across countries, and does not vary much with the sex of the respondent; the exception is Russian women, 5 % of whom are caregivers. In contrast, the proportion of adult children who do not provide care to parents with limitations in their ability to undertake everyday activities (i.e., noncaregivers) varies considerably across countries.

Table 2 Descriptive statistics for analytic samples

Country	Bulgaria		France		Georgia		Romania		Russia	
Gender	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Sample size	3102	3998	2466	3135	2263	2812	2996	2864	2022	3093
<i>Dependent variable</i>										
Depression scale	1.49 (2.72) ^a	2.57 (3.76)	1.65 (3.05)	3.11 (4.41)	1.83 (2.51)	3.19 (3.61)	1.98 (2.73)	3.01 (3.24)	1.92 (2.59)	3.33 (3.62)
Percentage at zero	56.4 %	43.3 %	56.7 %	40.7 %	39.0 %	25.0 %	42.2 %	29.2 %	42.1 %	25.8 %
<i>Independent variables</i>										
Caregiver (CG)	2.0 %	2.4 %	1.5 %	2.6 %	2.1 %	2.9 %	1.6 %	2.8 %	1.9 %	4.7 %
Noncaregiver (NCG)	9.2 %	8.8 %	30.2 %	28.2 %	9.8 %	12.9 %	27.1 %	27.0 %	12.0 %	12.7 %
Parent has no care needs ^b	88.8 %	88.8 %	68.3 %	69.2 %	88.1 %	84.2 %	71.3 %	70.2 %	86.1 %	82.9 %
Age	39.3 (9.9)	37.9 (9.1)	42.5 (10.8)	42.1 (10.8)	39.5 (9.5)	39.9 (9.7)	40.8 (9.8)	40.8 (10.0)	39.1 (9.6)	40.2 (9.8)
Father deceased	33.8 %	32.3 %	36.4 %	36.9 %	42.0 %	39.7 %	38.2 %	37.0 %	48.3 %	50.7 %
Mother deceased	8.7 %	7.6 %	7.9 %	7.1 %	9.1 %	9.1 %	8.5 %	7.8 %	8.4 %	9.0 %
Divorced or widowed	5.3 %	8.0 %	12.6 %	17.3 %	3.1 %	11.7 %	5.1 %	10.4 %	8.2 %	19.9 %
Single	18.4 %	9.4 %	8.3 %	7.2 %	19.2 %	14.4 %	10.5 %	4.8 %	6.1 %	4.5 %
Married or partnered ^b	76.3 %	82.6 %	79.1 %	75.5 %	77.7 %	73.9 %	84.4 %	84.8 %	85.8 %	75.6 %
Spouse/partner has care needs	1.3 %	1.9 %	3.4 %	3.0 %	1.2 %	2.7 %	5.5 %	7.7 %	0.6 %	1.1 %
Very good/good health ^b	83.5 %	79.5 %	82.6 %	80.1 %	59.1 %	41.7 %	80.2 %	73.4 %	46.8 %	29.5 %
Fair health	12.9 %	16.5 %	13.8 %	17.1 %	32.7 %	45.7 %	15.5 %	20.6 %	46.5 %	60.6 %
Very bad/bad health	3.6 %	4.0 %	3.6 %	2.8 %	8.2 %	12.6 %	4.3 %	6.0 %	6.7 %	9.9 %
Children present	51.3 %	64.0 %	45.4 %	51.0 %	62.3 %	65.8 %	53.8 %	57.0 %	56.5 %	62.7 %
Grandchildren present	4.0 %	6.6 %	5.0 %	5.3 %	6.5 %	6.5 %	4.9 %	5.2 %	4.6 %	5.3 %
In-laws present	2.1 %	9.1 %	0.2 %	0.2 %	2.3 %	23.2 %	3.3 %	5.2 %	2.9 %	3.4 %
Low occupation	52.7 %	29.0 %	40.5 %	18.3 %	31.8 %	9.6 %	54.2 %	30.3 %	56.6 %	20.1 %
Medium occupation ^b	26.5 %	41.2 %	33.6 %	58.0 %	42.4 %	40.7 %	26.7 %	43.4 %	18.3 %	39.6 %
High occupation	14.5 %	20.4 %	23.7 %	18.9 %	17.3 %	19.8 %	15.9 %	12.6 %	15.5 %	26.4 %
No work/occupation	6.3 %	9.4 %	2.2 %	4.8 %	8.5 %	29.9 %	3.2 %	13.7 %	9.6 %	13.9 %
Parent's age ^c	65.8 (10.1)	64.6 (9.5)	71.4 (11.2)	70.7 (11.3)	68.5 (10.0)	68.6 (9.9)	68.2 (9.9)	68.0 (9.9)	67.0 (10.4)	68.0 (10.5)

^a Standard deviations for continuous variables shown in parentheses^b Reference category in regressions^c Not included in regressions; see text

Given our coding scheme, the sum of the proportions coded as caregivers and as noncaregivers equals the proportion reporting a parent with limitations in abilities to undertake everyday activities. Surprisingly, this proportion is the highest in France, where we would expect older adults to enjoy the best health among these five countries. However, the parents of those in the French sample are considerably older than in the other four countries, as intergenerational age gaps are greater in France than in the other countries (with the exception of Georgia) because of past older ages at childbearing. This is itself would imply

that the surviving parents are more likely to be in need of care. Care needs are also high in Romania, and lower in the other three countries (and lowest in Bulgaria). One other pattern evident in Table 2 merits comment: the proportions of respondents reporting that their own health is poor, or that they are disabled, are highest in Georgia and Russia, and in each of those countries is higher among women than men. These patterns accord with the figures on the proportion of adult years spent in good health reported by Minagawa (2013) and reproduced in our Table 1 [indicator (8)].

Table 3 Impact of caregiver and noncaregiver status on depression score, by country

	Bulgaria	France	Georgia	Romania	Russia
<i>Pooled samples</i>					
Marginal effects ^a					
(1) Caregivers ^b	1.40***	0.36	1.11***	0.16	0.18
(2) Noncaregivers ^b	0.46***	0.35**	0.20	0.06	0.20
Female	1.21***	1.41***	1.04***	0.99***	1.24***
Test of (1) vs (2) ^c	7.62**	0.00	6.68**	0.19	0.01
<i>Male-only samples</i>					
Marginal effects ^a					
(1) Caregivers ^b	1.38**	0.35	0.71	0.20	0.45
(2) Noncaregivers ^b	0.19	0.29*	0.05	0.19	0.48**
Test of (1) versus (2) ^c	6.82**	0.01	3.03	0.02	0.01
<i>Female-only samples</i>					
Marginal effects ^a					
(1) Caregivers ^b	1.44**	0.35	1.55**	0.17	0.14
(2) Noncaregivers ^b	0.70**	0.41*	0.33	−0.11	−0.03
Test of (1) versus (2) ^c	2.40	0.00	6.91**	0.72	0.27

Controls are described in text. Each model includes controls for age, age squared, an indicator variable if only living parent is mother, an indicator variable if only living parent is father, marital status, health, spouse's/partner's need for care, occupational status, presence of children, presence of grandchildren, and presence of in-laws; an indicator of gender ("female") is included in the pooled-sample models

^a Difference in expected value of dependent variable when indicated variable = 1 versus = 0

^b Significance levels shown for test of H_0 : marginal effect = 0

^c Test statistics for equality of marginal effects are Chi square with 1 df

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The main findings from our multivariate analysis are shown in Table 3. The top panel shows country-specific (i.e., "pooled" sample) models that include *female* as an explanatory variable, followed by separate models for men and women. We show the marginal effect on the mean depression score of being a caregiver, and of being a "noncaregiver," with each case contrasted to someone with living parents, none of which are reported to need care (i.e., not at risk for caregiving). We also show the results of a statistical test of the equality of the marginal caregiver and noncaregiver effects.

The pooled-sample results confirm that women have higher average depression scores than their male counterparts, and that these differences are statistically significant. This first model also reveals two instances of statistically significant increases in respondent's depressive symptoms associated with caring for a parent with care needs, i.e., instances of "caregiver stress." This finding, which accords with a large number of past caregiver studies, is found in both Bulgaria and Georgia. However, we also find two instances of statistically significant "noncaregiver stress," among Bulgarian and French respondents. The point estimate of the marginal caregiver effect in France, while not significantly different from zero, is virtually identical to the

marginal noncaregiver effect in France, suggesting that the relative scarcity of caregivers in the French sample undermines our ability to detect significant differences. For Bulgaria, where both a caregiver effect and a noncaregiver effect are found, the former is significantly larger than the latter. In both Romania and Russia, the point estimates of both types of effects are very small in magnitude, suggesting that there are no effects of either type to detect.

Given the strong reasons to anticipate gender-specific patterns of caregiving and its consequences, and notwithstanding the small numbers problems for caregivers in these subsamples, we also report on separate-gender regressions in Table 3. Some, but not all, of the pooled-sample results also appear in the gender-specific regressions: the overall "caregiver stress" results for Bulgaria are found for both men and women considered separately, but for Georgia they appear only among women. The "noncaregiver stress" findings in France are also found for both men and women separately; the suggestion that sample sizes explain the absence of a caregiver stress result in France is also replicated in the gender-specific results. The only new finding to emerge in the gender-specific regressions is a significant noncaregiver stress result among Russian men.

Discussion

Our research addresses two questions: could prior findings suggesting that “noncaregiver stress” has its own, independent negative effect on adult children’s mental health, be replicated using data from additional countries; and, are the findings across countries comparable? For the first question, the answer is clearly yes: we find that non-caregivers whose parent has limitations in ability to undertake everyday activities manifest a higher depression score than otherwise comparable adults whose living parents reportedly do not suffer such limitations. However, while we find evidence of noncaregiver stress among both men and women, and in both a Western European and Eastern European setting, this pattern is by no means universal, appearing in only four of the 10 combinations of gender and country studied here.

We also find what must be viewed as the usual or expected result, namely elevated levels of depressive symptoms among caregivers, but in only three of the 10 country- and gender-specific models estimated. These “caregiver stress” findings also appear for both men and women, but only in Eastern European contexts. Interestingly, Hansen et al. (2013), who studied caregiver outcomes in a Western European context (Norway), also found little association between caregiver status and several measures of well-being. Moreover, within-country comparisons of the quantitative impact of providing care to a needy parent to that of not providing care to a needy parent produces a significant difference in only two of our cases (Bulgarian men and Georgian women). We hesitate to compare effect sizes across countries, other than to note that nearly all of the point estimates for Romania and Russia are quite small. Given those small magnitudes, sample size is not likely to be the explanation for the result.

While it is tempting to look for explanations for the cross-country differences in the pattern of findings among contextual factors such as those summarized in Table 1, we have considerably more possible explanatory factors than we have differences in need of explanation, forcing any such exercise to be mostly speculative. Nevertheless, a few puzzling results, and a few possible reasons for those puzzles, can be mentioned. Firstly, the ratio of caregivers to noncaregivers may seem low. However, it should be recognized that the variables used to define these groups vary somewhat. Caregivers are defined as those who report that they provide “regular help with personal care.” However, the question about parental health limitations refers to “normal everyday activities,” which encompasses a wider range of activities than the activities of daily living mentioned in the question about help. Therefore, many of the parents with health limitations may not have needed help with personal care. It is also possible that respondents

were providing them with other kinds of help, for example with shopping and housework.

It is striking that France, with per-capita national income much larger than the other four countries studied, and with greater longevity, better health, and a larger investment in health and care facilities, shows high levels of noncaregiver stress but no evidence of caregiver stress. As already noted, this may be the consequence of small numbers in our analysis sample. Yet the parents of French respondents are considerably older, and therefore may have more severe care needs, than the parents of respondents in the other four countries. The greater range of supportive services found in a resource-rich environment such as France’s may counteract the stresses uniquely associated with caregiver activity. It may also be the case that one’s parents’ functional decline is more upsetting in an environment rich in economic and care resources than in a more modest setting.

It is also interesting that Georgian women exhibit statistically significant levels of noncaregiver stress. Georgia is the country with the largest share of GGS respondents endorsing the idea that care needs of older needy persons are mainly a family matter (see Table 1); thus, Georgian non-caregiving women are, more so than any of the other groups represented in our study, departing from widely held attitudes and norms of caring behavior. Russian men also exhibit statistically significant levels of noncaregiver stress; they, too, live in a country where a large percentage of GGS respondents endorse the notion that elder care is primarily a family responsibility.

Regarding the high proportions of adult children that are noncaregivers in France and Romania, there are several possibilities for why this finding emerges. According to Giarchi (1996) the French believe the family is a central component of elder care. However, among the countries in our sample, they also have the most developed health care system and the most coordination among systems. Brandt et al. (2009) use data from the Survey of Health and Aging and Retirement in Europe and find similar levels of care provision as we find. They argue that countries with high levels of health care public expenditures experience “crowding out” for caregiving but “crowding in” for other helping tasks. That is, a division of labor between the public sector and family emerges whereby the public sector provides more time intensive care services while the family provides other day-to-day helping activities such as arranging services or paying bills. Such an arrangement would not be in conflict with France’s attitudes toward elder care, and it could help produce the combination of caregiver stress and noncaregiver stress impacts that we find. The Romanian story is distinct from the French and exists in a very different cultural context. It is possible that a large proportion of adult children are noncaregivers because Romanian elders tend to be both physically and

culturally isolated. Giarchi (1996) describes the elderly as “out of sight and out of mind,” which could explain the high prevalence of noncaregivers in our sample. Our findings are mixed, producing evidence in support of both the typical caregiver stress response and the less-studied noncaregiver stress response. The fact that each type of response is found in some, but not all, of the countries studied here suggests the need for additional research on these questions. A broader representation of country-level contexts and more extensive efforts to control for otherwise unmeasured determinants of caregiver health outcomes could be useful and illuminating. The pooling of data across countries, with additional controls for comparably measured contextual factors, might also help advance our understanding of the complexities of the caregiving experience.

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