Psychometric Properties of an Abridged Version of the Zarit Burden Interview Within a Representative Canadian Caregiver Sample

Norm O’Rourke, PhD1 and Holly A. Tuokko, PhD2

Purpose: Given the exponential increase in dementia prevalence anticipated in the coming years, measurement of caregiver burden has become common in gerontological research and clinical practice. The Zarit Burden Interview (BI) has emerged as the most widely utilized burden measure. The current study examines the psychometric properties of responses to an abridged, 12-item version of this scale.

Design and Methods: Data were derived from a national epidemiological study of dementia incidence and patterns of care (N = 1,095). Informal caregivers of surviving institutionalized and community-dwelling index subjects were interviewed 5 years subsequent to initial recruitment (n = 770).

Results: Results of both the exploratory and confirmatory factor analyses support a two-factor structure of responses to this abridged scale. Subsequent to control for demographic variables, dementia illness features, and baseline depressive symptoms at baseline, responses to this brief BI provide a significant increase to prediction of depressive symptoms at Time 2 (R² = .24, p < .01) with no additional variance provided by the 10 remaining items from the complete BI (ΔR² = 0, ns).

Implications: The results of this study are discussed relative to theory and the operational definition of caregiver burden. Findings can be generalized with greater confidence given the representative and national composition of caregivers recruited for this study.

Key Words: Burden, Caregivers, Dementia, Test Reliability, Test Validity

With awareness of the demands faced by those who provide care to persons with dementia, measurement of caregiver burden has become common in gerontological research and clinical practice. This construct has been defined as a context-specific negative affective outcome occurring as a result of one’s perceived inability to contend with role demands (O’Rourke, Haverkamp, Tuokko, Hayden, & Beattie, 1996). Implicit in this definition, various factors are believed to moderate caregivers’ ability to cope over time (cf. O’Rourke, Haverkamp, Rae, et al., 1996; Russo, Vitaliano, Brewer, Katon, & Becker, 1995).

Despite some conceptual ambiguity (Braithwaite, 1992), burden is commonly understood within the context of the cognitive phenomenological model of stress and coping (Lazarus & Folkman, 1984). Burden is thus seen to emerge as a function of one’s subjective belief that current and future resources are insufficient to meet role demands (Zarit, 1990). As a result, negative secondary appraisal (or burden) is believed to function as a harbinger of problematic physical and mental health outcomes, such as depressive symptomatology (O’Rourke & Tuokko, 2000). Support is found in the literature for this operational definition of caregiver burden (e.g., Clyburn, Stones, Hadjistavropoulos, & Tuokko, 2000; Lutzky & Knight, 1994).

The 22-item Burden Interview (BI; Zarit, Orr, & Zarit, 1985) has emerged as the most commonly used measure of caregiver burden. In recent years, however, abridged versions of the BI have been devised with the assumption that burden will be assessed more consistently if a reliable and valid brief measure can be identified (cf. Hébert, Bravo, &
Table 1. Descriptive Features and Psychometric Properties of Study Variables

<table>
<thead>
<tr>
<th>Instrument</th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>Kurtosis</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities of Daily Living</td>
<td>13.11</td>
<td>9.61</td>
<td>.96</td>
<td>-1.34</td>
<td>.15</td>
</tr>
<tr>
<td>Dementia Behavior</td>
<td>15.72</td>
<td>12.80</td>
<td>.86</td>
<td>1.44</td>
<td>1.08</td>
</tr>
<tr>
<td>Disturbance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-D, Time 1</td>
<td>7.45</td>
<td>8.49</td>
<td>.88</td>
<td>1.60</td>
<td>2.59</td>
</tr>
<tr>
<td>CES-D, Time 2</td>
<td>7.68</td>
<td>9.67</td>
<td>.91</td>
<td>1.81</td>
<td>3.45</td>
</tr>
<tr>
<td>Full Burden Inventory</td>
<td>15.58</td>
<td>13.76</td>
<td>.90</td>
<td>1.20</td>
<td>1.18</td>
</tr>
<tr>
<td>Brief Burden Inventory</td>
<td>7.56</td>
<td>7.84</td>
<td>.85</td>
<td>1.85</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Notes: The distribution of CES-D scores at Time 2 indicates positive skewness outside of normal parameters (Tabachnick & Fidell, 2001). Recalculation of CES-D scores to attain a more normal distribution (i.e., square root transformation, skewness = -.50) did not significantly alter study findings. CES-D = Center for Epidemiologic Studies–Depression scale.

Pre´ville, 2000; Knight, Fox, & Chou, 2000; Whitlatch, Zarit, & von Eye, 1991). One such scale has recently been proposed by Bédard and colleagues (2001). The 12 items of this brief BI were selected as those with the highest item-total correlations. Similar to the original measure, these authors contend that responses to their brief BI reflect two distinct factors (personal strain and role strain) with acceptable indices of internal consistency for both (i.e., α = .88 and α = .78, respectively). On the basis of various analyses, Bédard and colleagues (2001) conclude that their scale remains an effective measure of caregiver burden despite its relative brevity.

The current study provides a more rigorous examination of the psychometric properties and factor structure of this brief BI. As opposed to participant data derived from one circumscribed geographic region (Bédard et al., 2001), caregivers for the current study were randomly recruited from each Canadian province. In addition, longitudinal data were examined to ascertain the predictive validity of this brief BI relative to depressive symptoms as measured 5 years subsequent to initial measurement.

Methods

Participants

Caregivers.—Primary caregivers were identified by index subjects and/or their families as the person most responsible for day-to-day decisions. A primary caregiver was identified in all but seven cases (CSHA Working Group, 1994b). Of this total, 32 caregivers (2.8%) could not be contacted and 38 (3.4%) declined participation. Interviews were conducted in a location selected by the caregiver, at which time a trained research assistant administered all study measures (see Table 1 for descriptive statistics).

Interviews were conducted in the home of the caregiver (77.9%), index subject (4.6%), or another location selected by the caregiver (e.g., workplace; 17.5%). This flexibility was based on prior findings that those unable to travel to medical facilities represent a distinct subset of caregivers (Dura & Kiecolt-Glaser, 1990).

The CSHA caregiver sample included those supporting index subjects in the community (n = 469, Time 1), as well as those residing in institutions (n = 626, Time 1). This decision to include both groups was based, in part, on prior findings suggesting that neither involvement nor dysphoria appears to decline markedly for caregivers once their relative has been placed in institutional care (see Dura, Stuenberg, & Kiecolt-Glaser, 1991; Russo et al., 1995). Participation in the current study, however, was restricted to family or friends of persons with dementia (i.e., exclusion of paid or formal caregivers), because care provision is believed to be inherently more distressing for those personally committed to care recipients (N = 1,095, Time 1). It is assumed that paid caregivers represent a distinct population.

A follow-up study was undertaken to examine patterns of change in cognition and well-being of older adults, as well as the health and welfare of those who provide care (CSHA Working Group, 2002). All but 33 caregivers from the initial wave of data collection were located (5 years, 2 days on average after initial participation, SD = 3 months, 10 days). For analysis of predictive validity of the brief BI, participation was restricted to caregivers of index subjects who remained alive (n = 790, Time 1987) was administered. As compared with Folstein’s original Mini-Mental State Examination, the 3MS provides greater gradation of scores and covers a broader range of cognitive abilities (e.g., abstract reasoning, generative naming). Scores on the 3MS range from 0 to 100, with lower totals suggestive of cognitive impairment (Tombaugh, McDowell, Kristjansson, & Hubley, 1996).

Community-dwelling participants scoring below 78/100 on the 3MS and all those in institutions were invited to undergo clinical examination (N = 2,928). On the basis of all clinically relevant information, a consensus diagnosis was reached by interdisciplinary teams composed of a physician, neuropsychologist, nurse, and/or psychometrician (Tuokko, Kristjansson, & Miller, 1995).

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Caregivers of those who had died were excluded from this set of analyses, because it was assumed that bereavement would confound the relationship between burden and depressive symptoms.

Measures

Care Recipient Illness Characteristics.—Activities of Daily Living (ADLs). Caregivers were asked to rate care-recipients’ ability to perform 14 separate ADLs (both self-maintenance and instrumental activities). This measure was taken from the Older Americans Resources and Services Questionnaire (Multidimensional Functional Assessment of Older Adults; Fillenbaum, 1988). Respondents were asked to rate each ADL along a 3-point Likert-type scale [without help (0), some help (1), unable to do unaided (2)]. The range of possible ADL scores is 0–28, with higher totals reflecting greater impairment.

Dementia Behavior Disturbance (DBD) Scale. Caregivers were administered a separate measure to assess problematic behaviors directly related to neurodegenerative illness. The DBD scale (Baumgarten, Becker, & Gauthier, 1990) consists of 28 questions. Caregivers are asked to rate how frequently each behavior had occurred in the past week (e.g., “Hoards things for no obvious reason”; “Makes unwarranted accusations”). Responses are reported along a 5-point Likert-type scale [never (0) to all of the time (4)]. Possible scores range from 0 to 112, with higher totals reflecting greater disturbance.

In contrast to previous measures, the DBD scale was developed with a more narrow definition of behavioral disturbance to focus on the specific manifestations of dementia syndromes. Items, therefore, do not tap functional and somatic symptoms nor cognitive impairment as Baumgarten and colleagues (1990) contend that these features are related to illness severity, as opposed to behavioral disturbance.

From the initial validation study, responses to the DBD scale appear to possess optimal internal consistency (α = .83). Test-retest reliability over a 2-week period was reported as r = .71 (Baumgarten et al., 1990). Construct validity has been established relative to the Behavior and Mood Disturbance Scale, as responses to these two measures are strongly correlated (r = .73). These findings suggest that responses to the DBD provide a valid and reliable index of problematic behaviors attributable to neurodegenerative illness.

Caregiver Variables.—Demographic information was obtained at the time of initial participation. These questions included the age of caregivers, years of formal education, marital status, and relationship to the index subject. Caregivers were also asked whether or not they had experienced a series of health problems over the past year (i.e., allergies, chest problems, heart condition, kidney disease, cancer, diabetes, high blood pressure, arthritis/rheumatism, digestive troubles, nervousness, stroke, and insomnia). A cumulative variable was computed on the basis of endorsement of these health conditions.

Center for Epidemiologic Studies–Depression Scale (CES-D). The CES-D (Radloff, 1977) was administered at both baseline and follow-up. This measure asks respondents to rate the frequency of various depressive symptoms over the past week (e.g., “I had trouble keeping my mind on what I was doing”; “I felt lonely”). Responses are provided along a 4-point Likert-type scale ranging from rarely or none of the time (0) to most or all of the time (3). Among general adult samples, a cutoff score of 16 has been identified as suggestive of clinical depression (Radloff & Teri, 1986). However, a CES-D cutoff score above 20 has been proposed for older adults, given the prevalence of chronic health conditions that may be mislabeled as depression symptoms (e.g., insomnia, loss of energy; Himmelwright & Murrell, 1983; Lyness et al., 1997).

Lewinsohn, Seeley, Roberts, and Allen (1997) indicate that the utility of the CES-D is not compromised by age, gender, physical disease, or cognitive or physical impairment. Although developed and first validated with general adult populations, the CES-D appears appropriate for use with older adults (Lewinsohn et al., 1997).

The BI. The BI (Zarit, Orr, & Zarit, 1985) presents caregivers with a series of 22 questions regarding perceived strain in caring for persons with dementia. The degree to which caregivers endorse each item is rated along 5-point Likert-type scales. The range of possible BI scores is 0–88, with higher totals reflecting greater burden. Reported reliability coefficients for responses to the full-scale range from α = .88 (Hassinger, 1986) to α = .94 (O’Rourke & Wenaus, 1998).

The brief BI as proposed by Bédard and colleagues (2001) is composed of 12 of 22 BI items (see Table 2). Similar to the original scale, these authors contend that responses to this brief BI reflect two underlying constructs (i.e., personal strain and role strain). Concurrent validity of responses to the abridged scale was examined relative to indices of patient behavioral disturbance and ADL impairment (Bédard et al., 2001).

Results

Data were missing at both points of measurement (estimated at roughly 5% of usable data from CSHA-I and CSHA-II). The PRELIS program was used to estimate values for missing data (Jöreskog & Sörbom, 1996b). PRELIS imputes values on the basis of like responses as opposed to substituting mean item scores. According to Little and Rubin (1987), this method is preferable to substitution with mean values as the latter can obscure between group differences.

Consistent with prior research, the majority of caregivers in this study were female (780/1,095 or 71.2%). Adult children composed the majority of
Factor Structure of Responses to the Brief BI

Table 2. Abridged Zarit Burden Interview Items and Factor Composition as Proposed by Bédard and Colleagues (2001)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you feel that because of the time you spend with ___ that you do not have enough time for yourself?</td>
<td>timeself, PS</td>
</tr>
<tr>
<td>2. Do you feel stressed between caring for ___ and trying to meet other responsibilities for your family or work?</td>
<td>stressed, PS</td>
</tr>
<tr>
<td>3. Do you feel angry when you are around ___?</td>
<td>angry, PS</td>
</tr>
<tr>
<td>4. Do you feel that ___ currently affects your relationship with other family members or friends in a negative way?</td>
<td>relation, PS</td>
</tr>
<tr>
<td>5. Do you feel strained when you are around ___?</td>
<td>strained, PS</td>
</tr>
<tr>
<td>6. Do you feel your health has suffered because of your involvement with ___?</td>
<td>health, PS</td>
</tr>
<tr>
<td>7. Do you feel that you don’t have as much privacy as you would like because of ___?</td>
<td>privacy, PS</td>
</tr>
<tr>
<td>8. Do you feel that your social life has suffered because you are caring for ___?</td>
<td>soclife, PS</td>
</tr>
<tr>
<td>9. Do you feel you have lost control of your life since ___’s condition?</td>
<td>control, PS</td>
</tr>
<tr>
<td>10. Do you feel uncertain about what to do about ___?</td>
<td>uncertain, RS</td>
</tr>
<tr>
<td>11. Do you feel you should be doing more for ___?</td>
<td>domore, RS</td>
</tr>
<tr>
<td>12. Do you feel you could do a better job in caring for ___?</td>
<td>dobetter, RS</td>
</tr>
</tbody>
</table>

Notes: Items appear as adapted for the Canadian Study of Health and Aging (CSHA Working Group, 1994b). Abbreviated item names correspond to those shown in Figure 1. PS = personal strain factor; RS = role strain factor.

caregivers (56.7%) with a significant percentage of spouses (21.2%). The remainder self-identified as either friends or members of the index subjects’ extended family (e.g., daughters-in-law, grandchildren, nieces, and cousins). Given this percentage from younger generations, it is not surprising that the average age of caregivers (M = 58.64 years, SD = 12.65) was notably lower than index subjects (M = 85.53 years, SD = 6.50).

Response levels to this brief BI were significantly higher for female (M = 8.29, SD = 8.22) versus male caregivers (M = 5.77, SD = 6.47; t(1,093) = 4.87, p < .01). Also, internal consistency as measured by Cronbach’s alpha is somewhat higher for women (α = .85) than men (α = .82). Combined, α = .85, which indicates no appreciable loss in internal consistency, compared with the complete measure (α = .90). For both the full scale and brief BI, internal consistency of responses falls within optimal parameters (i.e., .90 ≥ α ≥ .80; Clark & Watson, 1995; DeVellis, 1991).

Predictive Validity of Responses to the Brief BI

Hierarchical regression analysis was next computed to ascertain the predictive validity of brief BI scores relative to depressive symptoms, as measured 5 years subsequent to initial administration of the BI (i.e., CES-D scores as the dependent variable). Baseline
Descriptive variables (age, sex, years of formal education, marital status, relationship to care recipient) were first entered to control for demographic effects on depressive symptoms ($R^2 = .14$, $p < .01$). Dementia illness characteristics at Time 1 were entered next as covariates (inability to perform ADLs, dementia-related behaviors, cognitive impairment; $\Delta R^2 = .02$, $p < .01$). CES-D totals at baseline were entered to control for initial depressive symptoms ($\Delta R^2 = .08$, $p < .01$). The brief BI was next entered again leading to a significant increase in prediction of CES-D scores at Time 2 ($\Delta R^2 = .02$, $p < .01$). Residual items from the original BI were entered last. This final step was undertaken to determine any loss in predictive validity as a result of item reduction. This would not appear to be the case, because no change in the predictive strength of this regression equation was observed subsequent to inclusion of the 10 items discarded from the complete scale ($\Delta R^2 = 0$, $ns$). This suggests no loss of predictive validity for the brief BI relative to the original 22-item scale. These results are notable given the extended duration between measurement of both caregiver burden and CES-D scores and rigorous control for demographic variables, dementia illness features, and depressive symptoms at baseline (see Table 3).

Consistent with the stress and coping paradigm, regression analyses presuppose that burden is an antecedent of depressive symptomatology. In other words, caregiver burden is believed to co-occur or precede the emergence of depressive symptoms (cf. Lawton, Moss, Kleban, Glicksman, & Rovine, 1991; Vitaliano, Russo, Young, Teri, & Maiuro, 1991). Analyses reported herein support this interpretation, because burden appears to predict significantly depressive symptomatology over and above rigorous control for baseline variables.

Of note, reversal of variables in an attempt to ascertain the predictive validity of depressive symptomatology at Time 1 relative to caregiver burden at Time 2 failed to lead to a significant increase in burden variance (subsequent to control for caregiver demographics, dementia illness variables, and baseline depressive symptoms; $\Delta R^2 = .003$, $ns$). This finding provides further support for the hypothesized causal association in which burden is assumed to precede or co-occur with depressive symptomatology.

**Cutoff Criteria for the Brief BI**

According to Bédard and colleagues (2001), a score above 16 on the brief BI is suggestive of clinically significant caregiver burden. This threshold was identified on the basis of response score distributions. The current study examined this brief BI cutoff score vis-à-vis depressive symptomatology at Time 1 relative to caregiver burden at Time 2. The brief BI exhibited a specificity rate of 90% (i.e., exclusion of 9/10 caregivers providing concurrent responses below threshold on the CES-D). At 49%, the level of sensitivity for this brief BI cutoff score was considerably less optimal. This latter result suggests that a score above 16 on the brief BI identified less than half of caregivers presenting within the clinically significant range on the CES-D. A cutoff...
score above 10 increases sensitivity to 75% relative to the CES-D; however, specificity drops to 68%.

These findings suggest that the cutoff score proposed by Bédard and colleagues (2001) does not serve as an effective index within this caregiver sample. It would therefore appear premature to propose a definitive cutoff. Similar to research and clinical applications with the original measure, the strength of this brief BI would appear to be as a continuous measure as opposed to a screening instrument.

**Discussion**

The results of this study provide general support for the psychometric properties of responses to the Bédard brief BI. Consistent with initial findings, internal consistency of responses to this measure remains within optimal parameters. Findings from the current study also support the factor structure reported by Bédard and colleagues (2001). Although EFA findings suggest that four items load across factors, CFA results support the two-factor structure with only one cross-loaded item.

Also of note, this brief BI appears to possess predictive validity relative to depressive symptomatology measured 5 years subsequent. Despite rigorous control for demographic variables, dementia illness variables and depressive symptoms at baseline, brief BI scores provide a significant increase in the predictive strength of this regression equation. In contrast, those items deleted from the original BI provide no incremental increase in observed variance.

However, the cutoff score proposed by Bédard and colleagues (2001) does not appear to provide an effective index of depressive symptomatology. Scores below the suggested cutoff identified the vast majority of asymptomatic caregivers, yet the sensitivity of this response level is less than adequate. This would indicate that this threshold is not viable, because identification of clinically significant dysphoria is more critical than exclusion of those who present as euthymic.

A further finding of note pertains to the negligible contribution of dementia illness variables relative to dysphoria among caregivers. Although the grouping of illness variables contributed significantly to prediction of depressive symptomatology, none of the variables attained individual significance. By contrast, the physical health of caregivers and years of education provided unique and incremental increase in prediction of depressive symptoms. As noted by Baumgarten (1989), caregiver characteristics are strongly associated with role-related distress in contrast to patient variables (e.g., ADL impairment, dementia-related behaviors, and illness severity). Results of the current study extend this observation from analysis of cross-sectional data to prediction of dysphoria several years in the future. One interpretation of this finding is that illness-related factors may trigger depressive symptomatology, yet the extent of symptoms is expressed relative to individual caregiver variables (O’Rourke, Haverkamp, Tuokko et al., 1996). In other words, the severity of depressive symptoms is determined as a function of caregiver or dyad-specific characteristics, such as the personality of caregivers (Hooker, Monahan, Shiffren, & Hutchinson, 1992), prior psychiatric history (Russo et al., 1995), and quality of the premorbid relationship (Williamson, Shaffer, & The Family Relationships in Late Life Project, 2001).

Results of the current study are more compelling because of the composition and size of the sample examined. In contrast to those recruited by Bédard and colleagues (2001), CSHA participants represent a randomly derived national sample. The findings of this study can thus be generalized with greater confidence. However, various methodological limitations of the CSHA should be noted. For instance, all questionnaires were administered in a serial order raising the possibility of carryover and order effects. Because questionnaires were not counterbalanced, these potential confounds can be neither measured nor discounted. Also of note, caregiver data were obtained via face-to-face interviews. Without provision for anonymity, responses to scales such as the BI may have been influenced by response biases (e.g., socially desirable responding; O’Rourke & Wenaus, 1998).

It should also be noted that caregivers in both studies responded to the complete set of BI items. Results may have differed had just the brief BI been administered as opposed to these selected items embedded within the complete 22-item scale. Future
research should administer just these 12 items when attempting to replicate current findings. Also of note, predictive validity was assessed on the same responses as included in item analyses (because of sample size considerations). Ideally, it would have been preferable to perform calculations on separate participant subsets, as repeated use of data may limit the ability to generalize current findings.

Overall, this study provides substantial support for the psychometric properties of the Bédard brief BI. No loss of reliability or validity would appear to result from reduction of items from the original scale. Consistent with the findings previously reported by Bédard and colleagues (2001), this brief BI appears to be an effective measure of caregiver burden.

References


