Assessment of Behavioral Problems in Dementia: The Revised Memory and Behavior Problems Checklist

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The Revised Memory and Behavior Problems Checklist (RMBPC), a 24-item, caregiver-report measure of observable behavioral problems in dementia patients, provides 1 total score and 3 subscale scores for patient problems (memory-related, depression, and disruptive behaviors) and parallel scores for caregiver reaction. Data were obtained from 201 geriatric patients and their caregivers. Factor analysis confirmed 3 first-order factors, consistent with subscales just named, and 1 general factor of behavioral disturbance. Overall scale reliability was good, with alphas of .84 for patient behavior and .90 for caregiver reaction. Subscale alphas ranged from .67 to .89. Validity was confirmed through comparison of RMBPC scores with well-established indexes of depression, cognitive impairment, and caregiver burden. The RMBPC is recommended as a reliable and valid tool for the clinical and empirical assessment of behavior problems in dementia patients.

The need for a brief, conceptually and psychometrically sound method for assessing behavioral problems in patients with dementia is clear. Behavioral problems and dementia are inexorably linked; indeed, dementia can scarcely be discussed without significant attention to the pervasive and complex behavioral problems that accompany it. Early writings first pointed to the role of such problems in diagnosis and management (Alzheimer, 1907), and numerous clinical reports have detailed the prevalence and diversity of such problems (e.g., Mace & Rabins, 1981; Powell & Courtice, 1983; Zarit, Orr, & Zarit, 1985). These problems include, but are not limited to, difficulties with personal hygiene and care, depression, agitation, and aggression. Recent empirical studies have further advanced our understanding of these problems; their relationship to the pathogenesis, etiology, and progression of specific dementias; and their impact on caregiving and health-care delivery. For example, it is now known that certain behaviors are common and potentially predictable aspects of dementia (Merriam, Aronson, Gaston, Wey, & Katz, 1988; Reisberg et al.,

1987; Swearer, Drachman, O'Donnell, & Mitchell, 1988; Teri, Borson, Kiyak, & Yamagishi, 1989; Teri, Larson, & Reifler, 1988). Other behaviors appear to be more idiosyncratic, tied to complex intra- and interindividual differences made even more complex by varying levels of cognitive impairment and differing rates of disease progression (Rubin, Morris, Storandt, & Berg, 1987; Teri et al., 1988). Behavioral problems are also highly associated with caregiver problems, such as burden and depression (Deimling & Bass, 1986; Drinka, Smith, & Drinka, 1987; Teri, Truax, Logsdon, & Pearson, 1989), stress and anxiety (Barnes, Raskind, Scott, & Murphy, 1981; McKhann et al., 1984), generalized distress (Gilleard, 1982; Greene, Smith, Gardiner, & Timbury, 1982; Haley, Brown, & Levine, 1987; Rabins, Mace, & Lucas, 1982), and strain (Niederehe et al., 1983). Furthermore, behavioral problems often predict institutionalization of patients (Chenowith & Spencer, 1986; Sanford, 1975). Thus, there is ample reason to identify and assess behavioral problems in patients with dementia.

The methods of behavioral assessment employed in the aforementioned studies have been as diverse as the studies themselves. Many researchers have used clinical information in an unstructured way; others have developed surveys or inventories unique to their investigation with vague, subjective, or global items that often lacked basic psychometric data (e.g., reliability and/or validity data). Therefore, although these studies have provided a solid foundation for our understanding and assessment of behavioral problems in dementia, they also point to the need for further study and for a clearly conceptualized, psychometrically sound measure of behavioral problems in patients with dementia.

In this article, we present such a measure. The Revised Memory and Behavior Problems Checklist (RMBPC) incorporates

several recent advances in the assessment of dementia-related behavioral problems. The RMBPC provides a unique focus on observable, potentially modifiable behaviors. Items were selected from a variety of clinical sources and previously established measures. The greatest proportion of items were drawn from the original Memory and Behavior Problems Checklist, developed by Zarit and associates (Zarit, Anthony, & Boutselis, 1987; Zarit, Todd, & Zarit, 1986; Zarit & Zarit, 1983). Additional behavioral items were selected to assess three domains of problematic behavior shown to be important in dementia: memory-related problems, depression problems, and disruption problems (e.g., asking repeated questions, crying, and verbal aggression, respectively). The RMBPC assesses the occurrence of behaviors using an objective scaling criterion. Behaviors are rated from *never occurs* (0) to *occurs daily or more often* (4). This provides a specific frame of reference rather than relying on more subjective scaling criteria, such as *occurs sometimes* or *always*. The RMBPC also evaluates the caregiver's reaction to each behavior, thereby providing an index of the impact of each behavior and behavioral domain on the caregiver. It is a paper-and-pencil, self-administered, easy-to-use tool, which can be employed in a variety of settings and requires less than 10 min to complete. It yields a global summary score, as well as more specific subscores for patient behavioral disturbance and caregiver reactivity.

In summary, the RMBPC was designed to be useful for clinical and research settings by (a) focusing on observable, conceptually relevant, potentially modifiable behaviors; (b) yielding an overall score with subscale scores for patient behaviors and caregiver reactions; and (c) using objective criteria within a self-administered framework, to enable clinicians and researchers to pinpoint areas of disturbance and target intervention goals for patients and caregivers in a cost-effective manner.

This study evaluates the psychometric properties of the RMBPC. In addition to obtaining descriptive data on a large sample of patients, a series of analyses were conducted to determine (a) whether the areas shown to be important in previous research (memory-related, depression, and disruption problems) were adequately represented and sufficiently independent to warrant separate subscales, (b) the reliability of the measure, and (c) the validity of the measure (through comparison of RMBPC scores with those of other, well-established measures).

Method

Subjects

Subjects were 201 consecutive patients and their accompanying caregivers/advocates who participated in a comprehensive physical, psychological, and neuropsychological assessment for cognitive impairment at the Geriatric and Family Services Clinic at the University of Washington Medical Center (Reifler, Larson, & Teri, 1987). To evaluate the RMBPC's applicability to the varied disorders presented in a geriatric clinic population as well as to assess its diagnostic efficacy, all new patients attending the clinic between April 1987 and April 1988 were included in the sample. Thus, a variety of diagnostic groups were represented. Most patients were referred by a family member or their primary care physician because of a concern about the patient's cognitive changes and/or mood disturbances. Demographic and diagnostic

information for the total sample of patients and caregivers is presented in Table 1.

Because the sample represented a consecutive series of patients in a hospital clinic, the sample consisted of patients with and without dementia. All were included in the development of the RMBPC because, in practice, the instrument is likely to be used on a wide variety of older adults who are seen for medical, cognitive, and psychological evaluations.

Procedures

Caregivers completed the measures described shortly during the patient's initial evaluation at the clinic. Patient measures were also ob-

Table 1
Patient and Caregiver Demographics (N = 201)

Variable	n	%	M	SD
Patients				
Age			74	8.1
Gender				
Female	129	65		
Male	72	35		
CES–D score			12	10.8
Education				
Less than grade school	7	4		
Grade school	51	27		
High school	89	47		
College	24	13		
Graduate degree	17	9		
MMSE score			19	6.3
HDRS score			10	7.6
Diagnosis				
Dementia				
PDD only	102	51		
Other	67	34		
With depression	47	28[a]		
Depression	21	10		
Other	11	5		
Caregivers				
Age			54	13.4
Gender				
Female	122	61		
Male	79	39		
Education				
Less than grade school	1	1		
Grade school	6	3		
High school	95	51		
College	55	29		
Graduate degree	31	16		
Caregiver relationship				
Wife	54	27[b]		
Husband	38	19		
Daughter	55	27		
Son	28	14		
Other relative	21	10		
Friend	5	2		
Living situation				
Lives with patient	132	68[c]		
Lives apart from patient	62	32		

Note. CES–D = Center for Epidemiological Studies—Depression Scale (Radloff, 1977); MMSE = Mini-Mental State Exam (Folstein, Folstein, & McHugh, 1975); and HDRS = Hamilton Depression Rating Scale (Hamilton, 1967); PDD = Primary degenerative dementia. [a] These subjects had a dementia diagnosis and were also depressed. Thus, the percentages exceed 100 and the *N* exceeds 201. [b] Percentage of column total. [c] Subject numbers do not sum to column totals because of missing data. Percentages are based on available data.

tained as part of the overall clinical interview conducted by experienced geriatric clinicians. Patient diagnosis of dementia and/or depression was made by the clinician responsible for conducting the geriatric evaluation and was based on patient and caregiver interviews and physical and neuropsychological evaluation. Patients diagnosed as demented and/or depressed met the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders,* Third Edition, Revised (American Psychiatric Association, 1987). For more details on clinic procedures, see Reifler et al. (1987) or Keller and Teri (1987).

Measures

Revised Memory and Behavior Problems Checklist (RMPBC). The RMBPC is designed to be completed by caregivers. (A full copy of the measure appears in the Appendix.) It is a self-administered, paper-and-pencil measure of (a) the frequency of problematic behaviors in patients with dementia and (b) caregiver reactions to these behaviors. An original pool of 64 items was derived from two sources: (a) 30 items from Zarit and Zarit's (1983) original Memory and Behavior Problems Checklist (MBPC) and (b) 34 new items developed by the authors to include specific behaviors not assessed on the MBPC and thought to be easily observable and representative of memory-related problems (e.g., asking repeated questions), depression (e.g., crying), and disruptive behaviors (e.g., verbal aggression) in patients with dementia. Consistent with the MBPC, each behavior was rated on two scales: Frequency, representing the rate of occurrence of individual behaviors (0 = *never occurs,* 1 = *occurs infrequently and not in the last week,* 2 = *occurred 1–2 times in the last week,* 3 = *occurred 3–6 times in the last week,* and 4 = *occurs daily or more often*), and Reaction, representing the degree to which individual behaviors "bother or upset" the caregiver (0 = *not at all,* 1 = *a little,* 2 = *moderately,* 3 = *very much,* and 4 = *extremely*). To simplify administration and scoring, the MBPC Frequency ratings *occurred frequently in the past but no longer occurs* and *would occur if not supervised* were omitted because the goal was to assess present behavior. Ratings that called for a judgment of what occurred in the past or what might occur in the future were therefore dropped.

Mini-Mental State Exam (MMSE; Folstein, Folstein, & McHugh, 1975). The level of patients' cognitive functioning was evaluated with the MMSE, which contains 11 items yielding a maximum score of 30 points. Immediate and delayed memory, orientation, language, and praxis are assessed. The MMSE is a widely used measure that has been shown to distinguish patients with dementia from those with other neuropsychiatric disorders and from normal adults (Folstein et al., 1975). A score of 24 or lower is generally considered to indicate impairment (Evans et al., 1989). The MMSE score for the total sample was 19 (*SD* = 6.3, range = 0–29), indicating that, overall, subjects performed in the mildly to moderately cognitively impaired range.

Hamilton Depression Rating Scale (HDRS; Hamilton, 1967). Patient depression was rated on the HDRS, a 17-item interviewer checklist with total scores ranging from 0 to 52, representative of the severity of depression. The HDRS has been demonstrated to have high reliability in a sample of patients with dementia (Gottlieb, Gur, & Gur, 1988), and it has been used successfully in treatment outcome studies of elderly depressed patients as a selection criterion and as a measure of change (Gallagher & Thompson, 1983; Salzman & Shader, 1979). Scores higher than 14 indicate the presence of depressive symptomatology (Hamilton, 1967). The mean HDRS score for the total sample was 10 (*SD* = 7.6, range = 0–36), indicating that, overall, subjects were within the normal to mildly depressed range.

Center for Epidemiological Studies—Depression Scale (CES-D; Radloff, 1977). Caregiver depression was assessed with the CES-D, a 20-item self-report of depression symptoms rated according to frequency of occurrence from less than 1 day per week to 5–7 days per week. The CES-D has been shown to have good reliability in studies with the

elderly (Radloff & Teri, 1986) and provides good agreement with other measures of depression. Possible scores range from 0 to 60, with higher scores indicating more depressive symptoms. The mean score for both younger and older adult subjects in the general population is 9, with 16 a useful cutoff score for designating subjects who are likely to be experiencing a significant level of depression (Radloff & Locke, 1986; Radloff & Teri, 1986). The mean CES-D score for caregivers in this sample was 12 (*SD* = 10.8, range = 0–60), indicating that, overall, caregivers were not clinically depressed.

Caregiver Stress Scale (Deimling & Bass, 1984). Caregiver stress was measured with the 23-item, self-report Caregiver Stress Scale. The scale included 6 items about the caregiver's emotional health (e.g., "I am more nervous or bothered by nerves than I was before"), rated on a 4-point scale from *strongly disagree* (1) to *strongly agree* (4); 8 items about the caregiver-patient relationship (e.g., "I feel pressured between trying to give to the patient as well as other family members"), rated on a 3-point scale from *not at all* (1) to *a great deal* (3); 5 items about whether social group and recreational activities have been influenced by caregiving responsibilities (e.g., "Do you visit with friends or family less often?"), rated on a 2-point scale consisting of *yes* (1) or *no* (2); and 4 items about the frequency of caregiver physical health problems (e.g., "How often has your health interfered with the things you wanted to do during the past month?"), rated on a 5-point scale from *almost never* (1) to *almost always* (5). Total scores could range from 18 to 73. The mean Caregiver Stress Scale score for caregivers was 36 (*SD* = 9.9, range = 18–63), suggesting they were moderately stressed.

Results

Sample Characteristics

No significant differences were found between subjects with and without dementia on age, $t(39) = 1.64$, *ns,* or gender, $\chi^2(1, N = 198) = .17$, *ns.* As expected, MMSE scores were lower for subjects with dementia, $t(103) = 13.48$, $p < .001$, and HDRS scores were higher for the subjects without dementia, $t(41) = 2.35$, $p < .05$. Caregiver demographics were not significantly different between patients with and without dementia: For age, $t(33) = .48$, *ns;* gender, $\chi^2(1, N = 175) = 3.3$, *ns;* and living situation, $\chi^2(1, N = 175) = .66$, *ns.*

Formulation of Final Items

Given the item pool, our goal was to develop a measure consisting of psychometrically independent subscales. To derive these scales, we performed a series of standard principal components analyses with orthogonal varimax rotation. Each analysis was conducted using the SPSS-X (version 3.0) computer program (Norusis, 1985). Prior to the first analysis, we attempted to reduce the item pool because of the poor ratio of subjects to items (201 to 64, or 3 to 1). This reduction was accomplished with internal consistency analyses. Raters grouped items into three theoretical content areas, hypothesized a priori as important in this population: memory-related problems, depression problems, and disruptive behaviors. Two licensed clinical psychologists (L.T. and R.L.) and one clinical psychology graduate student (P.T.) experienced in working with geriatric populations and administering and interpreting the original MBPC independently sorted each item into one of the three hypothesized content areas. Instructions were to group items by content into the categories depression, disruption, or memory-related problems. Results of item grouping were then compared across

raters, and for items on which there were disagreements, a criterion of agreement between two out of three raters was used to place an item in a group. Items that did not meet this criterion were dropped. Once the groups were formed, the criterion that the item had to have a multiple correlation of at least .50 with the total score was used as a robust criterion by which to retain items from each of the dimensions. On the basis of this procedure, 17 items were dropped: 4 from the memory-related-problems dimension, 8 from the depression dimension, and 5 from the disruptive-behaviors dimension.

The new total item set consisted of 47 items: 14 for memory-related problems, 15 for depression, and 18 for disruptive behaviors. The ratio of 201 subjects to 47 items, or 4.3 to 1, was considered an acceptable beginning because we expected that (a) repeated analyses would further reduce this ratio and (b) the final analysis would contain a respectable ratio of factors to items and sizable communalities (Hakstain, Rogers, & Cattell, 1982). The 47 items were subjected to a principal components analysis using the Frequency rating of each item. Frequency was used because every item had a Frequency rating, whereas only those items that occurred (e.g., had a Frequency rating greater than 0) had Reaction ratings. We applied the Scree criterion, in conjunction with the Kaiser-Guttman criterion. Principal components factors were extracted from the interitem correlation matrix using eigenvalues greater than 1, after which the solution was rotated to simple structure using varimax criterion. Although the Kaiser-Guttman criterion yielded 12 factors, the Scree test yielded 3 factors. Given that most scales need at least three items to compute internal consistency reliability, we examined Factors 4–12 for the number of significant loadings. With 200 subjects, a loading would have to be greater than .36 to be significant (Stevens, 1986). Only the first 6 factors contained at least 3 items with loadings greater than .36. On the basis of this criterion, 19 additional items were deleted because they did not load primarily on one of the first 6 factors.

The new set of 28 items was subjected to another principal components analysis with varimax rotation. Only three factors passed both the Kaiser-Guttman and the Scree tests. The next goal was to perform another analysis after eliminating items that did not load primarily on these factors. Twenty-four items were re-analyzed, and three factors were generated, explaining 53.4% of the variance. The first factor explained 31.3% (λ = 7.5), the second factor 11.8% (λ = 2.82), and the third factor 10.3% (λ = 2.46) of the variance. On the basis of their loadings, these factors were labeled Memory-Related Problems (mean loading = .68; 7 items), Depression (mean loading = .69; 9 items), and Disruption (mean loading = .63; 8 items). The factors and items are presented in Table 2.

We believe this is a meaningful and reliable solution because Hakstain et al. (1982) have argued that with an N of more than 250 and a mean communality of .60 or lower, the Kaiser-Guttman and Scree rules yield accurate estimates of the number of true factors. Although our N was less than 250, the low ratio of factors to items (3 to 24, or .013) strengthens the credibility of the resulting solution (Stevens, 1986).

Descriptive Data

Table 3 lists individual items for each factor, the percentage of subjects presenting each problem, and their mean Frequency

Table 2
Factor Loadings of Final Item Pool

Item	Loading
Depression (Factor 1)	
Comments about hopelessness	.84
Comments about being a burden	.80
Appears sad or depressed	.74
Comments about death	.71
Comments about being a failure	.67
Crying	.67
Comments about loneliness	.67
Appearing anxious	.59
Suicidal threats	.50
Disruption (Factor 2)	
Verbal aggression	.76
Threats to hurt others	.74
Destroying property	.64
Behavior dangerous to self or others	.64
Talking loudly and rapidly	.62
Embarrassing behavior	.62
Arguing	.57
Waking caregiver up	.43
Memory-Related Problems (Factor 3)	
Forgetting recent events	.85
Repeated questions	.80
Losing things	.75
Forgetting the day	.74
Forgetting past events	.62
Reduced concentration	.53
Not finishing tasks	.48

and Reaction ratings. As stated earlier, ratings ranged from 0 to 4, with 0 indicating *never occurs* and 4 indicating *occurs daily or more often*. The mean score for the Frequency ratings on the total scale was 33.59 (SD = 16.56, range = 1–87). The mean scores for Frequency ratings on the subscales were as follows: Memory-Related Problems, 18.33 (SD = 7.02, range = 0–28); Depression, 11.40 (SD = 9.28, range = 0–36); and Disruption, 5.64 (SD = 6.44, range = 0–28).

Because Reaction ratings depended on the occurrence of the behavior being rated, Reaction means were computed only on patient behaviors that occurred (i.e., 1 or greater on the Frequency rating). The mean Reaction score for the total scale was 22.69 (SD = 15.60, range = 0–77). Reaction means for the subscales were as follows: Memory-Related Problems, 11.12 (SD = 6.34, range = 0–28); Depression, 18.73 (SD = 8.47, range = 0–36); disruption, 14.85 (SD = 8.34, range = 0–32).

Although memory behaviors occurred most frequently (approximately once or twice per week), depression behaviors elicited the strongest reaction (moderate), suggesting that caregiver reactions may depend more on the type of patient behavior than on its frequency. This is supported by an examination of the individual items presented in Table 3. For the Depression subscale, "Appears anxious" and "Appears sad or depressed" occurred most often for the largest proportion of subjects, but reactions were strongest for the less frequently checked items, such as "Suicidal threats" and "Comments about death." Similarly, on the Disruption subscale, "Arguing" occurred most often for the largest proportion of subjects, but reactions were strongest for "Threats to hurt others."

Table 3
Prevalence and Mean Frequency and Caregiver Reaction Scores for Final Items

Item	% of patients in whom behavior occurred at least once weekly	Frequency[a]		Reaction[b]	
		M	SD	M	SD
Depression (Factor 1)					
Appears anxious	69	2.3	1.5	1.9	1.2
Appears sad or depressed	58	2.1	1.6	2.5	1.3
Comments about hopelessness	47	1.7	1.7	2.5	1.1
Comments about being a burden	34	1.2	1.5	2.0	1.3
Comments about loneliness	32	1.1	1.5	2.2	1.2
Crying	26	1.0	1.3	2.1	1.1
Comments about death	26	.9	1.4	2.5	1.3
Comments about being a failure	18	.6	1.2	2.0	1.1
Suicidal threats	9	.3	.9	2.6	1.3
Disruption (Factor 2)					
Arguing	43	1.7	1.6	2.2	1.2
Waking caregiver up	23	.8	1.3	1.7	1.3
Verbal aggression	21	.7	1.3	2.1	1.3
Embarrassing behavior	20	.8	1.2	1.7	1.1
Behavior dangerous to self or others	15	.6	1.1	2.4	1.4
Talking loudly or rapidly	10	.4	1.0	1.6	1.3
Threats to hurt others	6	.2	.8	2.9	1.2
Destroying property	5	.2	.7	1.9	1.4
Memory-Related Problems (Factor 3)					
Repeated questions	90	3.2	1.2	2.0	1.1
Forgetting recent events	85	2.7	1.7	1.5	1.3
Losing things	82	2.9	1.4	2.0	1.1
Forgetting the day	73	2.7	1.7	1.5	1.3
Reduced concentration	68	2.4	1.7	1.6	1.7
Forgetting past events	59	2.1	1.4	1.3	1.0
Hiding things	34	1.3	1.7	2.1	1.3

[a] Includes behaviors that had never occurred.
[b] Computed only for behaviors that occurred at least infrequently (i.e., 1 or above on the Frequency rating).

Reliability

Internal consistency was established by means of Cronbach's alpha coefficients for Frequency and Reaction total and subscale scores (see Table 4).

As before, Reaction scores were used only on patient behaviors that occurred, and thus Reaction alphas were calculated on fewer items. The alphas represent the shared variance of the items within each scale. In contrast, the squares of the intercorrelations of the scale scores represent the shared variances across scales. As can be seen in Table 4, the internal consistencies were much higher ($M = .75$ for Frequency and .87 for Reaction) than the squares of the correlations (i.e., the mean shared variance was only .13 for Frequency and .19 for Reaction). This suggests that the subscales measured independent and distinct phenomena. Similarly, intercorrelations between Reaction subscales were lower than internal consistency alphas.[1]

Validity

Frequency. The validity of Frequency items was investigated through Pearson correlations between the RMBPC subscales and the HDRS and MMSE as well as between the RMBPC subscales and the depression and dementia diagnoses. All correlation coefficients are summarized in Table 5. It was ex-

pected that the Depression subscale would be positively related to depression measures (concurrent validity) but not cognitive measures (discriminant validity). Conversely, it was predicted that the Memory-Related Problems subscale would be closely associated with cognitive impairment measures (convergent validity) but not depression measures (discriminant validity).

As predicted, Depression was positively related to both HDRS scores and depression diagnosis and was not signifi-

[1] The principal components analysis forced the scales to be uncorrelated and maximized the internal consistency. For this reason, the ratios of reliabilities to shared variances must be interpreted cautiously until they are cross-validated on independent samples. In this regard, we note that on an independent sample of 65 patients and caregivers, internal consistency analyses yielded similarly high alphas: For Frequency and Reaction, respectively, internal consistency was .75 and .76 for Memory-Related Problems, .82 and .77 for Depression, and .62 and .70 for Disruption. In addition, comparing this sample with age- and sex-matched controls, we found significant ($p < .001$) differences on all scales, indicating caregivers of patients with dementia reported significantly more problems than controls. Thus, the Revised Memory and Behavior Problems Checklist also discriminates between patients and controls. (Further information on this second sample is available in Vitaliano, Young, Russo, & McCann, in press, and Vitaliano, Russo, Young, Becker, & Maiuro, 1991.)

Table 4
Correlation and Internal Consistency of Subscales

Scale	Alpha	Depression	Memory-Related Problems	Disruption
		Frequency		
Frequency				
Depression	.80	—		
Memory-Related Problems	.79	.27**	—	
Disruption	.67	.44**	.37**	—
Total scale	.84			
		Reaction		
Reaction				
Depression	.89	—		
Memory-Related Problems	.88	.42**	—	
Disruption	.84	.52**	.33**	—
Total scale	.90			
		Reaction		
Frequency				
Depression		.48**	.13	.18*
Memory-Related Problems		.09	.37**	.17
Disruption		.20*	.18*	.45**

* $p < .05$. ** $p < .01$.

cantly correlated with MMSE or dementia diagnosis (see Table 5). Similarly, Memory-Related Problems significantly correlated with the MMSE and dementia diagnosis but not with the HDRS or depression diagnosis. Construct validity of the Disruption subscale was not evaluated because no similar measures were available. A significant relationship was found between Disruption and the HDRS but not the other variables. Interestingly then, the frequency of disruption behaviors may be related to the severity of depression, but not to depression diagnosis or cognitive impairment.

Because it was expected that Depression subscale items would be most prevalent in clinically depressed patients, criterion validity was examined by comparing patients who met criteria for depression with those who were nondepressed. As anticipated, more depression behaviors were reported for depressed than for nondepressed subjects, $t(155) = 5.1$, $p < .001$. Disruption and memory behaviors were not significantly dif-

Table 5
Correlations Between Frequency Scale and Other Measures of Patient Mood and Cognitive Functioning

Scale	HDRS	Diagnosis of major depression	MMSE	Diagnosis of dementia
Memory-Related Problems	.00	−.01	−.48**	.45**
Depression	.44**	.36**	−.04	.05
Disruption	.19*	.08	−.09	.10

Note. HDRS = Hamilton Depression Rating Scale (Hamilton, 1967); MMSE = Mini-Mental State Exam (Folstein, Folstein, & McHugh, 1975).
* $p < .05$. ** $p < .01$.

ferent in the two groups. Because it was also expected that Memory-Related Problems items would occur more frequently in subjects with dementia than in subjects without dementia, means on this subscale were compared for subjects with and without dementia. Again, as expected, memory behaviors occurred more frequently in subjects with dementia than in those without dementia, $t(33) = 5.56$, $p < .001$, whereas depression and disruption were not significantly different in the two groups. Thus, both concurrent and discriminant validity was demonstrated.

Reaction. Because caregivers who react strongly to patient behaviors may be more depressed and burdened than those who react less strongly, construct validity of the Reaction scale was evaluated through correlations with measures of caregiver depression (the CES–D; Radloff, 1977) and burden (the Caregiver Stress Scale; Deimling & Bass, 1984). As expected, all of the Reaction subscales were significantly related to both caregiver depression and burden. For caregiver depression, $rs = .29$, .31, and .26 (all $ps < .01$) for Memory-Related Problems, Depression, and Disruption, respectively; for burden, $rs = .32, .42$, and .41 (all $ps < .01$), respectively.

Comprehension of Item Content

Readability analysis indicated that the 24-item RMBPC requires a 10th-grade reading level (Flesch, 1948). To examine the association of caregiver education with the RMBPC, the subscale and total scores for both Frequency and Reaction ratings were correlated with the caregiver's number of years of education. Education and Frequency rating correlations were .17 ($p < .05$) for Depression, −.04 (ns) for Memory-Related Problems, .16 ($p < .05$) for Disruption, and .11 (ns) for the total scale. Education and Reaction correlations were .02 (ns) for Depres-

sion, $-.17$ $(p < .05)$ for Memory-Related Problems, .01 (ns) for Disruption, and .08 (ns) for the total scale. Thus, education did not appear to have a significant influence on caregiver ratings.

Discussion

The results of the present investigation support the use of the Revised Memory and Behavior Problems Checklist (RMBPC) as a measure of behavioral problems in patients with dementia. It provides an easy-to-use, easy-to-score, reliable, and valid method of assessing (a) the overall level of behavioral problems and (b) the degree of specific areas of behavioral dysfunction including memory-related problems, depression, and disruptive behaviors. It also provides indexes of caregiver reactivity associated with these patient scores.

Analysis of the RMBPC factor structures confirmed three first-order factors: Memory-Related Problems, Depression, and Disruption. Reliabilities of the overall scales of patients' behavior and caregiver reaction were .84 and .90, respectively, and reliabilities of subscale indexes ranged from .67 to .89. Concurrent and discriminant validity of the RMBPC were confirmed through examination of the relationship between the RMBPC patient indexes and the Hamilton Depression Rating Scale (HDRS), the Mini-Mental State Exam (MMSE), the diagnoses of depression and dementia, and by comparison of RMBPC caregiver indexes with the Center for Epidemiological Study—Depression Scale (CES-D) and the Caregiver Stress Scale. As predicted, the subscale for patient depression behaviors was significantly related to HDRS scores and a diagnosis of depression and was not associated with either the MMSE or a diagnosis of dementia. Also as predicted, the subscale for memory-related behaviors was significantly related to the MMSE and a diagnosis of dementia but not to the HDRS or a diagnosis of depression. The subscale for disruptive patient behaviors was associated with level of depression (HDRS) but not cognitive impairment (MMSE) or diagnosis. Caregiver reaction scores were significantly associated with caregiver depression (CES-D) and stress.

The RMBPC was designed to be used in clinical and empirical studies to assess behavioral problems in patients with dementia. The assessment of patient behaviors as well as caregivers' reactions to those behaviors distinguishes the RMBPC from measures that focus on either patient problems or caregiver distress, such as the BEHAVE-AD (Reisberg et al., 1987) or the Caregiver Burden Inventory (Novak & Guest, 1989). Each type of measure offers its own advantages and disadvantages. Clinically, the RMBPC may be used as an initial measure of behavioral disturbance to identify (a) the specific nature of behavioral problems exhibited by an individual patient and (b) the behavioral problems most distressing to caregivers. Such assessment may help clinicians target specific areas for intervention that are most salient for individual patients and their caregivers. Empirically, the RMBPC's provision of total and subscale scores may enable more sensitive investigation into the relationship between behavioral problems and other aspects of dementia, such as differing degrees and patterns of cognitive impairment, neuropathological/neuroradiological abnormalities, and varying levels of caregiver distress. The RMBPC may also be useful to monitor changes over the course of the disease

or as a treatment evaluation tool. Evaluating total and subscale scores before and after a designated intervention may help clinicians and researchers determine whether specific patient behaviors or caregiver reactions to these behaviors have changed.

Some of the strengths of the RMBPC may also be limitations. For example, the self-administered, paper-and-pencil format makes it very easy to use and inexpensive to administer. This format, however, also makes the RMBPC dependent on the caregiver's reading interpretation. Although a readability analysis indicated a 10th-grade education would suffice, caregivers with limited reading skills may need assistance completing the form. In addition, although validity confirmation appears to be good, there may be clinical and research occasions when a structured interview or direct behavioral observation is more appropriate to control for potential caregiver biases in reporting.

The true test of the utility of this, or any, measure is its application in diverse studies by a variety of investigators over time. Further psychometric studies are also needed and are currently underway. For example, we are currently collecting data on a larger independent sample in a longitudinal study to (a) determine whether the present results can be replicated, (b) investigate the pattern of these scores over time, and (c) compare the RMBPC with other recently developed measures of behavior problems. At this time, on the basis of the data presented in this article, the RMBPC appears to offer an unique method for assessing various areas of behavioral problems in patients with dementia and for evaluating caregiver reactivity to such problems.

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Appendix

Revised Memory and Behavior Problems Checklist

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SUBJECT ID # _____   DATE _____/_____/_____

                                                                    mm   dd   yy

PATIENT'S NAME _____

NAME OF PERSON FILLING OUT FORM

_____

INSTRUCTIONS

The following is a list of problems patients sometimes have. Please indicate if any of these problems have occurred <u>during the past week</u>. If so, how much has this bothered or upset you when it happened? Use the following scales for the frequency of the problem and your reaction to it. Please read the description of the ratings carefully.

FREQUENCY RATINGS:
0 = never occurred
1 = not in the past week
2 = 1 to 2 times in the past week
3 = 3 to 6 times in the past week
4 = daily or more often
9 = don't know/not applicable

REACTION RATINGS:
0 = not at all
1 = a little
2 = moderately
3 = very much
4 = extremely
9 = don't know/not applicable

Please answer all the questions below. Please circle a number from 0–9 for <u>both</u> *frequency* and *reaction*.

	Frequency	Reaction
1. Asking the same question over and over.	0 1 2 3 4 9	0 1 2 3 4 9
2. Trouble remembering recent events (e.g., items in the newspaper or on TV).	0 1 2 3 4 9	0 1 2 3 4 9
3. Trouble remembering significant past events.	0 1 2 3 4 9	0 1 2 3 4 9
4. Losing or misplacing things.	0 1 2 3 4 9	0 1 2 3 4 9
5. Forgetting what day it is.	0 1 2 3 4 9	0 1 2 3 4 9
6. Starting, but not finishing, things.	0 1 2 3 4 9	0 1 2 3 4 9
7. Difficulty concentrating on a task.	0 1 2 3 4 9	0 1 2 3 4 9
8. Destroying property.	0 1 2 3 4 9	0 1 2 3 4 9
9. Doing things that embarrass you.	0 1 2 3 4 9	0 1 2 3 4 9
10. Waking you or other family members up at night.	0 1 2 3 4 9	0 1 2 3 4 9
11. Talking loudly and rapidly.	0 1 2 3 4 9	0 1 2 3 4 9
12. Appears anxious or worried.	0 1 2 3 4 9	0 1 2 3 4 9
13. Engaging in behavior that is potentially dangerous to self or others.	0 1 2 3 4 9	0 1 2 3 4 9
14. Threats to hurt oneself.	0 1 2 3 4 9	0 1 2 3 4 9
15. Threats to hurt others.	0 1 2 3 4 9	0 1 2 3 4 9
16. Aggressive to others verbally.	0 1 2 3 4 9	0 1 2 3 4 9
17. Appears sad or depressed.	0 1 2 3 4 9	0 1 2 3 4 9
18. Expressing feelings of hopelessness or sadness about the future (e.g., "Nothing worthwhile ever happens," "I never do anything right").	0 1 2 3 4 9	0 1 2 3 4 9
19. Crying and tearfulness.	0 1 2 3 4 9	0 1 2 3 4 9

20. Commenting about death of self or others (e.g., "Life isn't worth living," "I'd be better off dead").   0 1 2 3 4 9   0 1 2 3 4 9

21. Talking about feeling lonely.   0 1 2 3 4 9   0 1 2 3 4 9

22. Comments about feeling worthless or being a burden to others.   0 1 2 3 4 9   0 1 2 3 4 9

23. Comments about feeling like a failure or about not having any worthwhile accomplishments in life.   0 1 2 3 4 9   0 1 2 3 4 9

24. Arguing, irritability, and/or complaining.   0 1 2 3 4 9   0 1 2 3 4 9