





The generalizability of empirically derived syndromes of collateral-reported elder psychopathology across 11 societies

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Abstract

The purpose of this study was to test whether a syndrome model of elder psychopathology derived from collateral ratings, such as from spouses and adult children, in the United States would be generalizable in 11 other societies. Societies represented South America, Asia, and Europe. The Older Adult Behavior Checklist

(OABCL) was completed by collateral informants for 6141 60- to 102-year-olds. The tested model comprised syndromes designated as Anxious/Depressed, Worries, Somatic Complaints, Functional Impairment, Memory/Cognition Problems, Thought Problems, and Irritable/Disinhibited. The model was tested using confirmatory factor analyses in each society separately. The primary model fit index showed a good fit for all societies, while the secondary model fit indices showed acceptable to a good fit for all societies. The items loaded strongly on their respective factors, with a median item loading of 0.69 across the 11 societies. By syndrome, the overall median item loadings ranged from 0.47 for Worries to 0.77 for Functional Impairment. The OABCL syndrome structure was thus generalizable across the tested societies. The OABCL can be used for broad assessment of psychopathology for elders of diverse backgrounds in nursing services and research.

KEYWORDS

cross-cultural, elders, empirical syndromes, psychopathology

1 | INTRODUCTION

The world population is aging rapidly (He et al., 2016). For older adults, substantial rates of emotional, behavioral, social, and cognitive problems have been reported in both community and residential settings (Olivera et al., 2008; Ron, 2004). Nursing professionals provide front-line care to older adults in a variety of environments (Grady, 2011). They will increasingly need assessment instruments for measuring constructs of elder psychopathology that are generalizable to elders of diverse backgrounds. Because information from collateral informants such as spouses and adult children is especially important when assessing older adults (Dyer et al., 2018; Lackamp et al., 2016), nursing professionals need assessment instruments that are based on collateral reports.

The generalizability of constructs of psychopathology measured by the same assessment instrument across societies must be tested empirically. Because most assessment instruments have been developed in a few rather similar societies, they may not be generalizable to other societies. They may not measure the same constructs, or not measure the constructs in the same way across societies, potentially leading to inaccurate assessment results. Cross-society generalizability is usually tested via confirmatory factor analysis (CFA) in the framework of measurement invariance. Measurement invariance is the notion that an instrument measures the same constructs in the same way across societies, which translates into a set of testable predictions (Millsap, 2012).

Using CFA, we tested the generalizability of syndromes derived from collateral ratings of psychopathology by United States elders using the Older Adult Behavior Checklist (OABCL; Achenbach et al., 2004) in 11 societies. The OABCL is part of a system of empirically based, transdiagnostic dimensional instruments that span from early childhood through old age, the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach, 2009). The

OABCL is intended for assessment of adults ages 60 and older. It assesses a broad spectrum of emotional, behavioral, social, and cognitive problems, plus personal strengths, relationships, substance use, illnesses, and living accommodations. The OABCL can be completed online or on paper by an elder's spouse/partner, friend, adult child, or caregiver in under 20 min. Software (ASEBA-Web; Research Center for Children, Youth, and Families, 2020) generates profiles of scores on the OABCL syndromes in relation to age and gender norms.

The seven empirically derived OABCL syndromes are designated as *Anxious/Depressed*, *Worries*, *Somatic Complaints*, *Functional Impairment*, *Memory/Cognition Problems*, *Thought Problems*, and *Irritable/Disinhibited*. The designations are descriptive of the problems that comprise the syndromes. The seven OABCL syndromes were derived via exploratory factor analyses (EFAs) and CFAs (Achenbach et al., 2004). Analogous syndromes were also derived from self-ratings by 60- to 98-year-olds obtained with the Older Adult Self-Report (OASR), a parallel instrument for assessing elder functioning (Achenbach et al., 2004).

Brigidi et al. (2010) tested the construct and criterion validity of OABCL syndromes in relation to measures of elders' cognitive performance, psychopathology, and adaptive functioning. OABCL syndrome scores had medium to large correlations with nine other indices of elder functioning. These included the Neuropsychiatric Inventory (Cummings et al., 1994), Mini-Mental State Exam (Folstein et al., 1975), Clock Drawing Test (Brodsky & Moore, 1997), Alzheimer's Disease Assessment Schedule (Rosen et al., 1984), Geriatric Depression Scale (Yesavage et al., 1983), Clinical Dementia Rating Scale (Morris, 1993), Dementia Severity Rating (Reisberg et al., 1982), Trail Making Test (Reitan & Wolfson, 1993), and Activities of Daily Living (Lawton & Brody, 1969). OABCL syndrome scores also discriminated significantly between patients diagnosed with dementia of the Alzheimer's type versus patients with mood

disorders, and between both of these patient groups combined versus elders with no diagnosable psychopathology. Results thus supported convergent, divergent, discriminant, and construct validity of the OABCL scales.

1.1 | Previous studies using the OABCL in different societies

Pires (2013) administered the Portuguese translation of the OABCL to 100 caregivers of 63- to 98-year-olds in Northern Portugal. The elders were also assessed with the Mini-Mental State Exam (Folstein et al., 1975) and the Clock Drawing Test (Brodsky & Moore, 1997). Half of the elders suffered from dementia of the Alzheimer's type, while the other half had no diagnosable psychopathology. The OABCL Worries, Thought Problems, Memory/Cognition Problems, and Functional Impairment syndrome scores discriminated significantly between the two groups, with the dementia group receiving significantly higher scores on all scales, except Worries. For the combined sample, the OABCL Worries syndrome score was associated with more favorable Mini-Mental State Exam and Clock Drawing Test scores, while the OABCL Functional Impairment syndrome score was associated with less favorable Mini-Mental State Exam scores.

Kim et al. (2017) administered the Korean translation of the OABCL to caregivers of 244 60- to 92-year-old South Korean elders. The elders were also assessed with the Korean Mini-Mental State Exam (Kang et al., 1997), the Seoul-Instrumental Activities of Daily Living (Ku et al., 2004), Korean Clinical Dementia Rating Scale (Choi et al., 2001), Korean Geriatric Depression Scale (Jung et al., 1997), and Caregiver-Administered Neuropsychiatric Inventory (Kang et al., 2004). All OABCL syndrome scores showed significant associations with other indices of elder functioning, after controlling for elders' age and educational level. The OABCL Functional Impairment and Anxious/Depressed syndrome scales yielded the most numerous significant correlations with other indices; 15 and 14, respectively, of the possible 17 correlations. Kim et al. (2017) also compared two clinical subsamples of patients with dementia ($N = 59$) and depressive disorder ($N = 48$). The OABCL Worries, Somatic Complaints, and Functional Impairment syndrome scales differentiated significantly between the two patient groups. Patients with dementia scored significantly higher than patients with depressive disorder on the OABCL Functional Impairment syndrome scale, but the reverse pattern was found for the Worries and Somatic Complaints syndrome scales.

The Portuguese and South Korean studies thus demonstrated the feasibility of using the OABCL outside the United States. The significant associations found between OABCL syndrome scores and other indices of elder functioning, plus the OABCL's power to discriminate between diagnostic groups of elders, supported its validity for assessment of Portuguese and South Korean elders.

1.2 | The present study

The purpose of the present study was to test how well the 7-syndrome OABCL model of elder psychopathology derived from collateral ratings of US elders (Achenbach et al., 2004) would fit collateral informant data in 11 other societies. Societies represented Asia, South America, and Northern, Southern, Eastern, and Western Europe.

As far as we know, this was only the second study in which the generalizability of syndromes of older adult psychopathology was tested across multiple societies. The first study was conducted by Ivanova et al. (2020), who tested the fit of the United States 7-syndrome model derived from self-ratings on the OASR to self-ratings by 12,826 60- to 102-year-olds in 19 societies. Their results supported the OASR syndrome structure across the tested societies. The present study was designed to extend multisociety testing of syndromes to collateral informant data obtained with the parallel OABCL.

2 | METHODS

2.1 | Samples

The OABCL was completed by collateral informants for 6141 60- to 102-year-olds from 11 societies. The 11 samples were obtained by members of the International ASEBA Consortium, a network of researchers around the world who conduct research using the ASEBA instruments. The researchers followed the standard OABCL instructions for informants to fill out the OABCL or for interviewers to read OABCL items aloud and enter the responses for informants, if necessary. No exclusion criteria were set. Recruitment procedures for obtaining population samples were tailored to local conditions. Procedures conformed to the ethical requirements of the researchers' institutions. All data were deidentified before being sent in electronic files to the principal investigators for analysis.

2.2 | Instrument and tested model

OABCL items were written to describe specific problems worded in the third person from the informant's perspective. The items are rated 0 = *not true (as far as you know)*; 1 = *somewhat or sometimes true*, or 2 = *very true or often true*, based on the preceding 2 months.

Achenbach et al. (2004) derived the 7-syndrome OABCL model from data for 741 US elders selected for having Total Problems scores at or above the median in a multistage national probability household survey. The 741 elders whose OABCLs were analyzed included participants in the national survey, elders in 29 residential and non-residential facilities and programs, recipients of mental health or substance use services, and participants in research studies.

For the seven OABCL syndrome scales, Achenbach et al. (2004) reported coefficients of internal consistency (Cronbach's alpha)

ranging from 0.66 (Worries) to 0.92 (Anxious/Depressed), and test-retest reliabilities ranging from 0.92 (Somatic Complaints) to 0.96 (Functional Impairment). When the 7-syndrome scales were used together to classify older adults who were referred versus not referred for mental health care, sensitivity (true positives) = 76%, and specificity (true negatives) = 87% (Achenbach et al., 2004).

Native speakers translated the OABCL into the languages of non-Anglophone societies. Other native speakers made back-translations into English, which were independently checked for semantic consistency with the original OABCL.

For each society, we tested how well the 97 OABCL items fit on their respective seven factors (latent constructs representing the syndromes), according to the US factor model. Eight to twenty OABCL items were fit per factor. No hierarchical relations among factors were specified, and no factor cross-loadings were allowed.

2.3 | Data analyses

Following recommendations by Achenbach et al. (2004) to exclude cases missing ratings for more than eight items, we excluded an average of 0.59% cases per society, ranging from 0% for Japan, Korea, Portugal, and Taiwan to 1.75% for Turkey. We followed the Achenbach et al. (2004) CFA procedures to test the generalizability of their factor model in each society. We transformed the 0-1-2 OABCL item ratings to 0 versus 1 or 2, and computed tetrachoric correlations for the bivariate items. We used CFA with the WLSMV estimator in Mplus (Muthén and Muthén (2018) to test the OABCL 7-syndrome model in data from each society. We chose the root mean square error of approximation (RMSEA) as our primary model fit index because Yu and Muthén (2002) identified it as the best performing index for the WLSMV. They found that RMSEA values of < 0.05–0.06 consistently indicated a good model fit for ordered categorical variables. The Comparative Fit Index (CFI; Bentler, 1990) and Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) were our secondary model fit indices. We used CFI and TLI values of 0.80 to 0.90 to indicate acceptable fit, and > 0.90 to indicate good fit (Hu & Bentler, 1999; Marsh et al., 2004). Hu and Bentler (1999) suggested that CFI and TLI values > 0.95 should be used to indicate a good fit. However, Marsh et al. (2004) argued that this criterion was too stringent for complex factor models in applied research. Because our model was significantly more complex than the model comprising three 5-item factors tested by Hu and Bentler, we used less stringent criteria of 0.80–0.90 to indicate acceptable model fit, and ≥ 0.90 to indicate good model fit.

3 | RESULTS

Table 1 presents sample information for each society, such as sample size, primary reference, descriptive statistics for age and gender, sampling procedure, the residence of the assessed person (where he/she lived at the time of assessment), respondent type (i.e.,

respondent's relationship to the assessed person), and response rate. For all societies except China and Korea, the primary reference was for unpublished raw data that were collected for this project.

Samples ranged from 299 (Brazil) to 1635 (Japan), with a mean N of 558. Mean ages ranged from 69.7 (China) to 75.6 (Japan), with an overall mean age of 71.7 years. Percent male ranged from 33% (Korea) to 48% (Albania) with an overall mean of 39.8%. Most (94%) of the assessed older adults lived in the community, either in their own home or with relatives. Proportions of respondent types differed widely across societies preventing us from systematically testing the effect of respondent type on model fit.

The tested model converged for all societies. For Taiwan, the model excluded items 61. *Sees things that aren't there* and 75. *Strange ideas* because they were seldom reported.

Across the 11 societies, the RMSEA ranged from 0.021 (Iceland and Serbia) to 0.033 (Portugal), indicating a good fit for all societies. Also across the 11 societies, the RMSEAs were 0.023, 0.026, and 0.030 at the 25th, 50th, and 75th percentiles, respectively. CFI/TLI values ranged from 0.831/0.826 for Korea to 0.965/0.964 for China, indicating acceptable to a good fit for all societies. CFI and TLI values were similar within societies (Pearson $r > 0.999$).

Large loadings of items on their assigned factors are another indicator of model fit. As Table 2 shows, averaging across societies, the median item loadings ranged from 0.12 (item 89. *Too concerned about being neat or clean*) to 0.88 (item 22. *Doesn't get along with other people*), with an overall median of 0.69. Considered by syndrome across societies, the median item loadings ranged from 0.47 for Worries to 0.77 for Functional Impairment.

The OABCL items also had large loadings on their assigned factors in each society. The median of factor loadings in each society ranged from 0.60 (Korea) to 0.82 (China), with an overall median of 0.69. As Table 3 shows, for 9 of the 11 societies, median factor loadings were large for all syndromes. For Albania and Brazil, median factor loadings were large for all syndromes except Worries.

Of the 1067 item loadings (97 loadings \times 11 societies), 1052 (99%) were statistically significant (which Mplus determines based on the p value of the ratio of the parameter estimate over its standard error). As Table 3 shows, all items had statistically significant loadings on their respective factors for China, Japan, and Poland. For Albania, Iceland, Korea, and Serbia, one item had a nonsignificant loading on its factor. For Taiwan and Turkey, two items had nonsignificant loadings. Finally, three items had nonsignificant loadings for Brazil and four items for Portugal.

Of the 15 nonsignificant item loadings, 10 were for items on the Worries syndrome: 3 were for item 72. *Worries about family*; 2 each were for items 51. *Worries about appearance*, 89. *Too concerned about being neat or clean*, and 101. *Wakes up too early*; and 1 was for item 102. *Worries about health* (see Table 3). Of the remaining five nonsignificant items, two were for item 86. *Thinks about sex too much*, and one each were for items 21. *Worries about his/her future*, 49c. *Nausea or feels sick*, and 49d. *Can't see well, even with glasses*.

Another indicator of model fit is whether the estimated model parameters fall within their allowable range, or are "identified."

TABLE 1 Descriptive information about the samples and sampling procedures

Society (N)	Primary reference	Mean age	SD	Age range	% Male	Sampling procedure	Residence	Respondents' relationship to the assessed person	Response rate
Albania (858)	Sokoli (2018)	70.1	7.1	60–93	48	Multistage, demographically stratified sample of households within all Albanian municipalities.	Own home or with relative: 809 (94.3%) Other: 37 (4.3%) Missing data: 12 (1.4%)	Spouse/partner: 449 (52.3%) Child: 31 (3.6%) Other: 335 (39%) Missing: 43 (5%)	NA
Brazil (299)	Da Silva Oliveira (2018)	70.8	8.3	60–93	34	Community sample of convenience recruited through researchers' professional networks and social centers serving older adults.	Own home or with relative: 290 (97%) Other: 5 (1.7%) Missing data: 4 (1.3%)	Spouse/partner: 53 (17.7%) Child: 124 (41.5%) Other: 87 (29.1%) Missing: 35 (11.7%)	92%
China (639)	Liu et al. (2021)	69.7	7.4	60–90	45	Community sample of convenience recruited by nursing teams from the Shanghai Longhua Hospital and the Shanghai Shuguang Hospital. Team members used their social networks and attended a community health fair to recruit participants.	Own home or with relative: 633 (99.1%) Other: 6 (0.9%)	Spouse/partner: 48 (7.5%) Child: 317 (49.6%) Other: 247 (38.7%) Missing: 27 (4.2%)	86%
Iceland (392)	Guðmundsson and Sigurðardóttir (2018)	73.4	8.5	60–98	41	Older adults registered with the Icelandic national registry who were assessed by collateral informants they chose, plus older adults who were assessed by adults (age 18 and older) who are registered with the Icelandic national registry.	Own home or with relative: 353 (90%) Other: 38 (9.7%) Missing data: 1 (0.3%)	Spouse/partner: 128 (32.7%) Child: 106 (27%) Other: 155 (39.5%) Missing: 3 (0.8%)	25%
Japan (1,635)	Funabiki (2018)	75.6	9.5	60–99	36	National household sample recruited by an online research firm that maintains nation-wide participant panels.	Own home or with relative: 1611 (98.5%) Other: 24 (1.5%)	Spouse/partner: 784 (48%) Child: 584 (36%) Other: 267 (16%)	NA
Korea (597)	Kim et al. (2015)	72.1	7.7	60–100	44	Demographically stratified national community sample recruited face-to-face in community programs and enriched with a small sub-sample recruited in residential facilities.	Own home or with relative: 463 (77.6%) Other: 134 (22.4%)	Spouse/partner: 213 (35.7%) Child: 72 (12.1%) Other: 312 (52.3%)	47% of OASR sample, which had an 80% rate

(Continues)

TABLE 1 (Continued)

Society (N)	Primary reference	Mean age	SD	Age range	% Male	Sampling procedure	Residence	Respondents' relationship to the assessed person	Response rate
Poland (301)	Zasepa and Mistic (2018)	70.9	8.9	60–100	33	Demographically stratified community sample conducted face-to-face and enriched with a small subsample recruited in residential facilities.	Own home or with relative: 293 (97.3%) Other: 7 (2.3%) Missing data: 1 (.3%)	Spouse/partner: 83 (27.6%) Child: 94 (31.2%) Other: 124 (41.2%)	72%
Portugal (352)	Caldas et al. (2018)	72.9	9.0	60–102	39	A community sample recruited via a snowball/referral procedure: recruited participants were asked to identify potential participants in their social networks.	Own home or with relative: 304 (86.4%) Other: 48 (13.6%)	Spouse/partner: 65 (18.5%) Child: 63 (17.9%) Other: 218 (61.9%) Missing: 6 (1.7%)	90%
Serbia (300)	Markovic et al. (2018)	71.0	8.6	60–97	33	Convenience community sample stratified by age and gender to be representative of the Novi Sad metropolitan area.	Own home or with relative: 248 (82.7%) Other: 52 (17.3%)	Spouse/partner: 68 (22.7%) Child: 94 (31.3%) Other: 130 (43.3%) Missing: 8 (2.7%)	65%
Taiwan (318)	Chen (2018)	70.6	7.5	60–93	48	Demographically and regionally stratified community sample recruited mostly via word of mouth, flyers and the internet.	Own home or with relative: 318 (100%)	Spouse/partner: 142 (44.7%) Child: 83 (26.1%) Other: 93 (29.2%)	95%
Turkey (450)	Anafarta-Sendag and Erol (2018)	72.0	8.3	60–94	42	Demographically and regionally stratified community sample. Participants were recruited in diverse recreational, health, lay and religious, and residential community centers.	Own home or with relative: 438 (97.3%) Other: 11 (2.4%) Missing data: 1 (0.2%)	Spouse/partner: 70 (15.6%) Child: 194 (43.1%) Other: 186 (41.3%)	NA

Note: Residence = where the assessed person lived at the time of assessment.

Abbreviations: NA, not available; SD, standard deviation.

TABLE 2 Descriptive statistics for factor loadings across 11 societies by OABCL syndrome

Syndromes and items	Mean factor loading	SD	Median factor loading
Anxious Depressed	0.67	0.12	0.67
8. Can't get mind off thoughts	0.58	0.11	0.60
9. Can't sit still	0.47	0.17	0.44
11. Lonely	0.68	0.09	0.69
13. Cries	0.66	0.13	0.66
14. Concerned about getting old	0.64	0.12	0.64
21. Worries about future	0.54	0.26	0.63
23. Feels too guilty	0.69	0.13	0.71
26. Fears	0.58	0.12	0.57
28. Fears doing bad	0.65	0.15	0.66
32. Feels worthless	0.83	0.10	0.83
34. Restless, fidgety	0.69	0.15	0.69
40. Nervous	0.75	0.07	0.75
42. Lacks self-confidence	0.72	0.11	0.71
45. Fearful, anxious	0.77	0.09	0.76
47. Guilty conscience	0.75	0.13	0.76
62. Self-conscious	0.58	0.14	0.56
91. Thinks about past	0.63	0.12	0.67
93. Sad	0.81	0.08	0.82
100. Worries	0.59	0.19	0.58
109. Concerned about death	0.67	0.10	0.65
Worries	0.36	0.36	0.47
51. Worries about appearance	0.40	0.28	0.49
72. Worries about family	0.23	0.28	0.20
89. Concerned about neatness	0.13	0.29	0.12
90. Trouble sleeping	0.35	0.43	0.53
101. Wakes up early	0.24	0.30	0.20
102. Worries about health	0.49	0.37	0.66
117. Get too tired	0.47	0.44	0.65
121. Feels burdensome	0.48	0.59	0.77
Somatic Complaints	0.66	0.10	0.66
5. Too much medication	0.59	0.08	0.57
33. Feels sick	0.86	0.04	0.85
46. Dizzy	0.74	0.07	0.75
49a. Aches	0.65	0.08	0.64
49b. Headaches	0.56	0.13	0.56
49c. Nausea	0.69	0.19	0.72
49d. Eye problems	0.52	0.17	0.54
49e. Itching, rashes	0.56	0.11	0.55
49f. Stomachaches	0.63	0.11	0.64
49g. Vomits	0.66	0.21	0.65
49h. Heart pounds	0.67	0.10	0.62
49i. Numbness	0.70	0.05	0.70

(Continues)

TABLE 2 (Continued)

Syndromes and items	Mean factor loading	SD	Median factor loading
49j. Short of breath	0.72	0.07	0.73
103. Nightmares	0.73	0.08	0.70
Functional Impairment	0.74	0.09	0.77
3. Difficulty getting things done	0.73	0.07	0.76
10. Too dependent	0.76	0.03	0.77
16. Sits around	0.73	0.09	0.76
29. Difficulty preparing meals	0.68	0.11	0.68
54. Poor task performance	0.84	0.09	0.85
55. Clumsy	0.80	0.07	0.82
68. Sleeps more than most	0.59	0.09	0.56
92. Lacks energy	0.75	0.12	0.76
104. Trouble dressing	0.76	0.15	0.73
106. Trouble bathing	0.77	0.11	0.76
111. Soiling accidents	0.68	0.09	0.69
Memory/Cognition Problems	0.71	0.08	0.72
7. Can't concentrate	0.71	0.05	0.72
12. Confused	0.85	0.06	0.85
20. Forgets names	0.60	0.09	0.63
52. Can't finish things	0.80	0.06	0.78
69. Trouble with decisions	0.75	0.07	0.74
70. Can't talk	0.71	0.11	0.69
110. Can't remember	0.73	0.05	0.73
114. Forgets if not written down	0.55	0.12	0.54
122. Worries about memory	0.65	0.13	0.67
Thought Problems	0.67	0.12	0.69
24. Jealous	0.69	0.20	0.72
27. Bad relations with neighbors	0.63	0.12	0.65
30. Feels no one cares	0.78	0.10	0.80
31. Feels others out to get him/her	0.78	0.11	0.77
36. Hears things	0.63	0.19	0.65
38. Rather be alone	0.49	0.10	0.47
41. Twitches	0.62	0.12	0.58
57. Repeats acts	0.69	0.13	0.66
58. No friends	0.72	0.08	0.72
60. Secretive	0.44	0.17	0.43
61. Sees things	0.68	0.19	0.70
74. Strange behavior	0.79	0.11	0.75
75. Strange ideas	0.74	0.13	0.75
77. Mood changes	0.77	0.07	0.78
99. Withdrawn	0.63	0.14	0.66

(Continues)

TABLE 2 (Continued)

Syndromes and items	Mean factor loading	SD	Median factor loading
Irritable/Disinhibited	0.69	0.11	0.72
2. Argues	0.62	0.13	0.62
15. Mean	0.81	0.09	0.82
18. Seeks attention	0.69	0.11	0.71
19. Damages things	0.75	0.16	0.73
22. Doesn't get along	0.87	0.05	0.88
25. Gets along badly with family	0.78	0.09	0.77
35. Wants own way	0.38	0.14	0.39
37. Impulsive	0.71	0.06	0.71
39. Does things other don't like	0.79	0.07	0.82
43. Not liked	0.79	0.10	0.80
59. Screams	0.71	0.10	0.72
65. Shows off	0.51	0.15	0.52
67. Irresponsible	0.76	0.11	0.77
76. Stubborn	0.73	0.13	0.78
79. Suspicious	0.69	0.14	0.68
83. Talks too much	0.51	0.09	0.50
84. Irritates people	0.83	0.04	0.82
85. Loses temper	0.77	0.08	0.77
86. Thinks about sex	0.44	0.26	0.39
94. Loud	0.63	0.18	0.62

Note: Items are designated with numbers they bear on the OABCL and summary labels for their content. Values in italics are descriptive statistics for syndromes. Syndrome means and SDs were calculated as means of mean loadings and of SDs across societies. Syndrome medians were calculated as medians of median loadings across societies.

Abbreviations: OABCL, Older Adult Behavior Checklist; SD, standard deviation.

When testing a complex model such as ours, minor model un-identification (un-identification of a few parameters) is generally acceptable. For 10 societies, all items were identified. For China, two items were unidentified (i.e., had negative residual item variance): Item 19. *Damages or destroys things* and item 49g. *Vomiting or throwing up*.

4 | DISCUSSION

We tested how well the 7-syndrome OABCL model of elder psychopathology derived for United States elders fit data obtained in 11 other societies. Our results indicated that the model fit in every tested society. The primary model fit index indicated good fit, whereas the secondary indices indicated acceptable to a good fit in all societies. The cross-society median item loading was a high 0.69, and 99% of item loadings were statistically significant. The overwhelming majority of items thus measured their respective syndromes well. When considered by syndrome, the median OABCL

item loadings ranged from 0.47 for Worries to 0.77 for Functional Impairment, indicating large-item loadings for each syndrome. Our findings were consistent with previous findings for the OASR, a parallel self-report questionnaire, whose syndrome structure was supported in 19 societies, in addition to the United States (Ivanova et al., 2020).

Of the handful of item loadings that were not statistically significant, 10 (67%) belonged to the Worries syndrome. Combined with the smaller median item loading (0.47) for Worries than for other syndromes (the second smallest median item loading was 0.66 for Somatic Complaints) and the relatively poor fit of this syndrome for Albania and Brazil, this finding suggests that the Worries syndrome may not be as strongly generalizable across societies as the other OABCL syndromes. This may be because collateral informants are less consistent when rating the most unobservable problems assessed by this syndrome than the more observable problems assessed by other syndromes. Moreover, because Worries has the fewest items, its smaller correlational matrix may make its factor structure harder to confirm than the other syndromes. It is important to note that the median cross-society loading of 0.47 still indicates that its items have substantial associations with the Worries factor.

When assessing older adults, nurses and other health professionals recognize the importance of obtaining information from collateral informants, as well as from the older adults themselves. Collateral reports are, of course, essential when assessing older adults who are unable to report on their own functioning. Consistencies and inconsistencies between informants can provide important information about how the assessed person is functioning in different contexts and how self-aware he or she is. They can also offer complementary perspectives, with collateral informants being better positioned to judge certain overt problems (e.g., impulsive or disruptive behavior), and the assessed persons being better positioned to report about their internal experiences (e.g., feeling worried or sad). Rescorla et al. (2020) reported a correlation of 0.68 for the Total Problems score (the sum of ratings on all items) for 5584 cross-informant pairs in the 11 societies, plus the United States, who completed the OABCL and OASR.

The seven tested syndromes assess a broad spectrum of problems, such as anxiety and depression, somatic complaints (without known medical cause), functional impairment, irritability, and disinhibition, as well as memory and other cognitive problems. Because the OASR and OABCL have parallel formats, items, and syndrome structures, professionals working with older adults can use scoring software to generate profiles of elders' scores that directly compare their OABCL and OASR scores at the item and syndrome levels. These cross-informant profiles can provide a more comprehensive picture of the assessed person than the picture provided by a single-informant's report.

Loi and Lautenschlager (2017) found that, while clinicians working in residential elder care facilities recognized the importance of assessing elder psychopathology using standardized assessment instruments, they did not employ standardized assessments. Because assessments can be completed online or on paper in 15–20 min by

TABLE 3 CFA results

Society	RMSEA	RMSEA 95% CI	CFI	TLI	Items with nonsignificant loadings	Median factor loadings							
						Overall	A/D	W	SC	FI	M/C	TP	I/D
Albania	0.030	0.029–0.031	0.879	0.876	51	0.62	0.58	–0.27	0.64	0.68	0.66	0.55	0.66
Brazil	0.025	0.022–0.027	0.890	0.887	89, 86, 102	0.68	0.66	–0.13	0.66	0.76	0.69	0.66	0.76
China	0.023	0.021–0.024	0.965	0.964		0.82	0.84	0.71	0.78	0.79	0.75	0.89	0.84
Iceland	0.021	0.019–0.024	0.946	0.945	86	0.69	0.72	0.57	0.60	0.73	0.69	0.65	0.71
Japan	0.026	0.026–0.027	0.939	0.938		0.82	0.80	0.66	0.81	0.80	0.82	0.83	0.83
Korea	0.028	0.027–0.029	0.831	0.826	72	0.60	0.51	0.28	0.62	0.79	0.67	0.66	0.56
Poland	0.028	0.026–0.031	0.896	0.893		0.70	0.62	0.46	0.68	0.75	0.76	0.68	0.76
Portugal	0.033	0.031–0.035	0.846	0.842	21, 51, 89, 101	0.67	0.59	0.31	0.67	0.78	0.76	0.71	0.69
Serbia	0.021	0.018–0.024	0.933	0.931	72	0.66	0.67	0.49	0.69	0.65	0.68	0.68	0.69
Taiwan	0.026	0.023–0.029	0.913	0.911	49c, 49d	0.73	0.76	0.62	0.64	0.70	0.73	0.72	0.73
Turkey	0.030	0.028–0.032	0.904	0.901	72, 101	0.68	0.61	0.48	0.69	0.73	0.68	0.69	0.77

Note: For Taiwan, the model excluded items 61 and 75 due to insufficient item variance.

Abbreviations: AD, anxious depressed; CFA, confirmatory factor analysis; CI, confidence interval; FI, functional impairment; I/D, irritable/disinhibited; M/C, memory/cognition problems; RMSEA, Root Mean Square Error of Approximation; SC, somatic complaints; TP, thought problems; W, worries.

elders and collateral informants and cover a broad spectrum of problems that are relevant for most older adults, the OABCL and OASR offer nurses and other clinicians practical assessment instruments for a variety of eldercare settings, including general and specialty health services and residential care facilities.

Van der Linde et al. (2012) conducted an ambitious systematic review of 36 other reviews of studies of older adult “behavioural and psychological symptoms,” which they defined broadly to include “depressive symptoms, anxiety, apathy, sleep problems, irritability, psychosis, wandering, elation, and agitation.” Van der Linde et al. (2012) found that “behavioural and psychological symptoms” occurred across the spectrum of cognitive functioning, including in older adults without dementia, with cognitive impairment, and with dementia. Also, they concluded that advances in this area were constrained by the limited use of standardized assessment instruments, the overwhelming focus on depression at the expense of other types of problems, and lack of attention to informant factors. The OABCL and OASR can help to advance nursing research on elder psychopathology by providing standardized assessment of diverse emotional, behavioral, social, and cognitive problems from a coordinated, multi-informant perspective. Data collected with the OABCL and OASR can be scored in relation to multicultural norms that account for differences in scale scores across societies (Achenbach & Rescorla, 2019).

Although the 7-syndrome model derived from ratings of United States elders was supported in societies that differed in many ways from the United States, it is possible that different assessment items and/or different data processing and analytic methods might yield different results. For example, not dichotomizing item ratings or using a different estimator might have led to different results. It is

also possible that the OABCL and our analytic methods would yield different results in societies that were not included. These possible limitations need to be addressed in future research.

The present study offers evidence of the generalizability of the structural validity of constructs of psychopathology measured by the OABCL in 11 societies outside the United States. In the framework of measurement invariance, these results support configural invariance of the OABCL, or the prediction that its pattern of item loadings on their assigned latent factors is the same in the tested societies. Configural invariance is the foundational form of measurement invariance that is a prerequisite for all other forms. Results of this study are thus the first step in establishing the full measurement invariance of the OABCL across societies.

CONFLICT OF INTERESTS

Masha Ivanova, Thomas Achenbach, Lori Turner, and Julie Dumas are employed by the non-profit University of Vermont Research Center for Children, Youth, and Families (RCCYF) which publishes the Older Adult Behavior Checklist (OABCL).

DATA AVAILABILITY STATEMENT

The data used in this study are available from the corresponding author upon reasonable request and with permission from all co-authors.

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How to cite this article: Ivanova, M. Y., Achenbach, T. M., Rescorla, L. A., Turner, L. V., Dumas, J. A., Almeida, V., Anafarta-Sendag, M., Carlos Caldas, J., Chen, Y.-C., da Silva Oliveira, M., Erol, N., Funabiki, Y., Guðmundsson, H. S., Kim, Y. A., Leite, M., Liu, J., Markovic, J., Misiec, M., Oh, K. J., ... Zasępa, E. (2021). The generalizability of empirically derived syndromes of collateral-reported elder psychopathology across 11 societies. *Res Nurs Health*. 44, 681–691. <https://doi.org/10.1002/nur.22161>