Cultural Adaptation of Translated Neurocognitive Assessments in Russia, Switzerland and Italy: Pilot Testing for a Program to Delay the Onset of Mild Cognitive Impairment Due to Alzheimer's Disease

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Background

- Cultural adaptation of neurocognitive assessments can improve the quality of translated instruments by ensuring tasks, stimuli, instructions, and scoring are appropriate for populations of interest.
- Successful adaptation assures cultural appropriateness while maintaining the construct validity and integrity of the original instruments.
- FDA recommends cultural adaptation in accordance with the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guidelines.[1,2] These guidelines served as the basis for the present approach.
- Three pilot studies investigated newly adapted instruments included in a cognitive battery intended for use in a pivotal investigation of transition from normal aging to mild cognitive impairment (MCI) due to Alzheimer's disease (AD).
- Pilot testing interviews, including abbreviated administrations of the neurocognitive battery, were conducted in Russia, Switzerland (German language), and Italy.
- Feedback from in-country psychologists, testers, and subjects led to revision of adapted measures to account for cultural and linguistic differences and to improve the quality of translations prior to large-scale use.

Cognitive Battery

The Cognitive Battery included the Mini Mental State Examination (MMSE), in addition to the following assessments:

Table 1. Cognitive Battery

Cognitive Domain	Tests
Episodic Memory	California Verbal Learning Test – 2nd Edition (CVLT-II) Brief Visuospatial Memory Test – Revised (BVMT-R)
Executive Function	Trail Making Test, Part B (TMT B) Wechsler Adult Intelligence Scale (WAIS-III) Digit Span Test – backwards span
Language	Multilingual Naming Test (MiNT) Semantic Fluency (animals) Lexical/Phonemic Fluency (F, A, and S)
Attention	WAIS-III Digit Span Test – forward span Trail Making Test, Part A (TMT A)
Visuospatial	Clock Drawing Test (CDT) Copy of BVMT figures

Methods

- Trained testers conducted interviews with ten participants (ages 65-86 years) in each country.
- Participants in Russia were 5 men and 5 women, mean age 73.3 years (range 68-82, median 72); in Switzerland, 5 men and 5 women, mean age 73.4 (range 65-78, median 71); and in Italy 3 men and 7 women, mean age 73.0 (range 66-86, median 71).
- Subjects and testers in each country provided feedback regarding clarity of test instructions and test items, difficult or unclear wording, and potential improvements to language.
- Three psychologists /neuropsychologists in each country reviewed each assessment along with tester and subject feedback to provide insight on construct validity and cultural appropriateness of adapted measures.

Results

Table 2. Number of Comments Received by Country

Assessment	Country			
	Russia	Switzerland (German)	Italy	TOTAL
	105 (48%)	30 (14%)	84 (38%)	219
General Feedback	9	0	9	18
MMSE	4	0	3	7
CVLT-II	13	6	21	40
BVMT-R	24	0	12	36
Digit Span	6	0	9	15
TMT A & B	3	1	11	15
MiNT	13	20	29	62
Semantic Fluency	5	1	7	13
Lexical Fluency	3	2	3	8
Clock Drawing	4	0	1	5
TOTAL	**105 (48%)**	**30 (14%)**	**84 (38%)**	**219**

Feedback Regarding Cultural Adaptation

- In all three countries, alternative wording was recommended to clarify task demands and to produce better understanding by the target population (42% of all comments); **Tables 3-5**.
  - Revision of California Verbal Learning Test-II (CVLT-II) word lists was beyond the scope of the present project. Suggestions for improved translation of items were incorporated, but alternate words and word lists were not.
- Russian feedback indicated potential differences in speed of processing tasks due to a strong cultural emphasis on accuracy over speed, reduced exposure to alphabetical sequencing (TMT B), and unfamiliarity with timed testing.
- The MiNT (Multilingual Naming Test) elicited the most feedback (28% of comments), including requests for improved pictures and allowances for alternate acceptable responses.
  - Following pilot testing, improved picture stimuli were provided by the author.
  - Picture of the "plug" item was adapted for each region in which testing will occur (**Figure 1**).
  - Alternate correct responses were included to account for regional differences in vocabulary.
- Swiss reviewers expressed a preference for Swiss German over High German words (e.g. Lastwagen vs. LKW, Heugümper vs. Grashüpfer).
  - In order to facilitate more widespread use of the translated (German) measures, the decision was made to adhere to High German vocabulary in all cases.

Table 3.

Measure	Feedback Regarding Cultural Adaptation – Russia
General Comments	• Extra words common in English (e.g., just, please, because) are unnecessary in Russian.Δ • Update instructions: In Russian, the word "simply" suggests that task may be performed in a simple or complicated way.Δ • Instructions are very long, possibly due to Russian words being longer.
Mini Mental State Examination (MMSE)	• Instructions should include endings for both males and female, depending on gender of subject and rater.□
California Verbal Learning Test – 2nd Edition (CVLT-II)	• Requests to change words based on length, usage, double meaning, frequency in the population. • Accept diminutive forms of words denoting small-ness (kitchen – kitchenette, handkerchief – hanky, book – booklet).Δ • Reviewers reported that Russian words are longer than their English counterparts. Longer words may be difficult to memorize.○ • Substitute the word "Termites" (ТЕРМИТ), not encountered in Russian territory, subjects unfamiliarΔ • Remove use of the word "I" in instructions, this distracts and fixes attention on rater, not task.Δ
Brief Visuospatial Memory Test – Revised (BVMT-R)	• Remove phrases "I know it sounds difficult" and "I understand, it may seem difficult". In Russian, this conveys an attitude that task is difficult and may frighten subjects, causing unnecessary anxiety.Δ • Remove words "try" and "best that you can": In Russian it is assumed that subjects are already trying their best.Δ
Trail Making Test (Part B)	• Reviewers indicated that the Cyrillic alphabet may not be used by Russians with the same frequency or be as highly overlearned as the English alphabet is in America.○ • Elderly Russians unaccustomed to timed tasks, which may make them nervous. Tend to prioritize accuracy over speed.○
Multilingual Naming Test (MiNT)	• Electrical plug picture should be updated to be culturally appropriate.Δ • Remove pictures of objects that elderly Russians do not encounter in their everyday life or are difficult to perceive (e.g. 'portholes' on a ship; 'blinds' only recently became widely available in Siberia).○ • Include alternate responses: – Witch – "Baba Yaga", a Russian folk witch, rides in a bucket instead of broom.Δ – Peacock - Peacock is similar to "Russian Firebird" from folklore, typical depiction is similar to peacock and may be indistinguishable.Δ – Kite – "ВОЗДУШНЫЙ ЗМЕЙ" (literally, 'Air Serpent'), need to allow for responses not typical in English , due to linguistic ideology of word (e.g., "Serpent" ("ЗМЕЙ") as a derivation of "Air Serpent").Δ
Semantic Fluency (Animal)	• Remove phrase "as fast as possible": Timed task concerns, may focus on doing something well, rather than quickly.○
Clock Drawing Test	• Allow for cultural variations in clocks – e.g., Russians may draw square clocks, instead of circular (reportedly square clocks are equally common). • Change instructions on paper dimension: '8 1/2" x 11' to 'A4'.Δ

Δ Feedback incorporated in revision of adapted measure.
○ Potential performance difference.
□ Addressed through rater training.

Table 4.

Measure	Feedback Regarding Cultural Adaptation – Switzerland
California Verbal Learning Test – 2nd Edition (CVLT-II)	• Requests to change words based on length, usage, double meaning, frequency in the population. • Preference for Swiss German words over (High) German words. • Request to change phonological distractors to more prototypically German items.
Multilingual Naming Test (MiNT)	• Electrical plug picture should be updated to be culturally appropriate.Δ • Subjects had difficulty with semantic cue "insect" for butterfly – many did not know butterflies are insects. • Difference in cultural perceptions of when rainbows appear could affect semantic cue – with the rain (Swiss) vs. after it rains (Western). Semantic cue from Western perspective – "is found in the sky *after* it rains". • Include alternate responses: – Dustpan – "Schaufel" or "Schüfeli" (a small shovel).Δ – Blind – "Lamellenstoren" or "Jalousie".Δ – Butterfly – "Sommervogel" (Summer Bird).Δ
Clock Drawing Test	• Change instructions on paper dimension: '8 1/2" x 11' to 'A4'.Δ

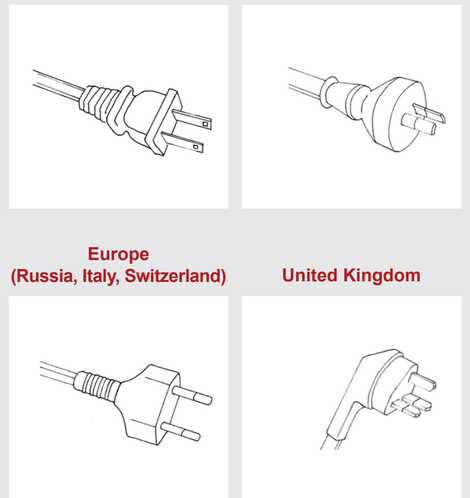
Δ Feedback incorporated in revision of adapted measure.

Table 5.

Measure	Feedback Regarding Cultural Adaptation – Italy
Mini Mental State Examination (MMSE)	• Change Repetition phrase "Nessun se, e o ma" (No Ifs ands or buts) to "Non c'è se né ma che tenga". This is more appropriate for Italian.Δ
California Verbal Learning Test – 2nd Edition (CVLT-II)	• Requests to change words based on length, usage, double meaning, frequency in the population. • Remove/replace non-Italian words (e.g. jeans, shampoo, patio) – common in modern Italian, but unfamiliar to older population.Δ
Trail Making Test (Part B)	• Remove letters J & K, (inserting letters up to N). Letters J & K are not contained in Italian alphabet.Δ
Multilingual Naming Test (MiNT)	• Electrical plug picture should be updated to be culturally appropriate.Δ • 'Seesaws' are not common in Italy. The word for swing/seesaw ("altalena") is used interchangeably to refer to both a seesaw and a swing. • Change pictures based on male and female stereotypes: 'Pressure gauge' more familiar to men, women may interpret as thermometer, like that of an oven, (unit measure may help). • Include alternate response: Witch – "Befana", an Italian folk witch.Δ
Lexical/Phonemic Fluency (F, A, and S)	• Change letters F-A-S to P-F-L: Letters represent high frequency letters in Italian language.Δ
Clock Drawing Test	• Change instructions on paper dimension: '8 1/2" x 11' to 'A4'.Δ

Δ Feedback incorporated in revision of adapted measure.
○ Potential performance difference.
□ Addressed through rater training.

Figure 1.



Conclusions

- Pilot studies allowed for the identification and correction of errors and inconsistencies prior to finalization of adapted measures.
- Results suggest that pilot testing can improve adaptation of performance-based neurocognitive assessments and provide insight regarding potential performance differences.
- Insights from these pilot studies have helped produce an improved culturally-appropriate neuropsychological test battery for use in English, German, Italian, and Russian.

References

1. Wild D, et al. *Value Health*. 2005;8(2):94-104.
2. Wild D, et al. *Value Health*. 2009;12(4):430-40.

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