How To Translate Cognitive Outcomes Measures? The Case Study Of The Parkinson's Disease-Cognitive Rating Scale In 15 Languages

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The Methodological Question Being Addressed

This poster intends to address the methodological question of translating the subtests of the Parkinson's Disease-Cognitive Rating Scale (PD-CRS). The main difficulty was in developing the best methodology to create translations using words, numbers, letters, and images culturally and linguistically acceptable and capturing the same concept as the original measure.

Introduction (Aims)

The Parkinson's Disease-Cognitive Rating Scale (PD-CRS)[1] is a screening battery designed to assess cognitive alterations associated with Parkinson's disease (PD). It includes nine subtests assessing posterior-cortical and frontal-subcortical defects:
- Immediate verbal memory (read aloud 12 written words, and recall as many words as possible after 3 trials)
- Confrontation naming (name the line drawings shown on 20 consecutive cards)
- Sustained attention (report number of letters in a sequence of numbers and letters)
- Working memory (repeat the numbers first, and then the letters)
- Clock drawing
- Clock copying
- Delayed free recall verbal memory
- Alternating verbal fluency (to alternately generate as many different words as possible beginning with the letter 'S' and words describing clothing articles)
- Action verbal fluency (to say as many actions as possible)

The PD-CRS was originally developed in Castilian Spanish. The objectives of this study are to present the methodology used to translate the PD-CRS into 15 languages (representing six language families – Table 1), and to display the outcomes of the translations.

Table 1. List of languages into which the PD-CRS has been translated

Family	Language
Afro-Asiatic	Arabic (Israel), Hebrew
Austronesian	Malay (Singapore)
Dravidian	Tamil (Singapore)
Indo-European	French (Canada, France), German (Germany), Norwegian, Portuguese (Portugal), Russian (Israel), Spanish (USA), Swedish (Sweden)
Japonic	Japanese
Sino-Tibetan	Mandarin (Singapore, Taiwan)

Methods

- The British English version was used as the source document. The standard linguistic validation process[2] generally used to translate patients' self-reported measures had to be adapted to face the challenges of adapting to another culture the list of words, letters, numbers and drawings presented to the patients.

- In each country, the process was as follows:
  – one forward translation by a medical translator,
  – a meeting with a speech therapist and a neuropsychologist to review the translation and discuss the suitability of the words and the drawings in the linguistic and cultural context of their country, one back-translation into English,
  – a review by another neurologist, a review by the developer,
  – a final proofreading step.

- In addition, the adaptation of each subtest had to follow specific rules. For instance, the rules for adapting each drawing were:
  1) if culturally acceptable, use the most frequent word to describe it, and 2) if not culturally acceptable, replace it by a suitable equivalent, making sure that the confrontation naming task is based on similar levels of difficulty independently on language used.

Results

Two subtests raised a lot of queries and discussion, i.e., the Confrontation naming and the Alternating verbal fluency. Translation issues are presented below along with a detailed description of each subtest.

Confrontation naming

Instructions: Participant is asked to name the line drawings shown on 20 consecutive cards. There is no time limit for response, and only one trial is given. No semantic or phonemic cues are provided. When objects are included in their context (bib, buckle, mane, hook, jingle bell, and hoof), the examiner is allowed to indicate the part of the line drawing to be named. See complete list of images in Table 2 (Scoring).

- No changes in the line drawings were required in nine languages, i.e., Hebrew and all Indo-European languages (n=8).
- In total, nine drawings raised a lot of discussion, i.e., bib, cherry, stool, anchor, buckle, mane, panel screen, hoof, and door bolt. See Table 3.
- The languages the most impacted were Chinese for Singapore and Taiwan, and Tamil for Singapore with respectively six, five and three drawings changed. For instance, hoof was replaced by chicken feet (Chinese), and bib by craddle (Tamil).

Table 2 (Scoring). 1 point for each line drawing correctly named (0-20)

	YES	NO		YES	NO
BIB	1	0	BUCKLE	1	0
CANDLE	1	0	MANE	1	0
CHERRY	1	0	HOOK	1	0
STOOL	1	0	SCREWDRIVER	1	0
ANCHOR	1	0	PANEL SCREEN	1	0
TURTLE	1	0	SAFETY PIN	1	0
KITE	1	0	JINGLE BELL	1	0
FISHBOWL	1	0	HOOF	1	0
BULB	1	0	EXTINGUISHER	1	0
GUITAR	1	0	DOOR BOLT	1	0
TOTAL					

Table 3. Line drawings modified in the Confrontation naming task

Original line drawings	Languages with modified line drawings					
	Arabic	Chinese (SG)	Chinese (TW)	Japanese	Malay (SG)	Tamil (SG)
Bib	No change	Apron	No change	No change	No change	Craddle
Cherry	No change	Banana	Banana	No change	Banana	Banana
Stool	Sofa	No change	No change	Sofa	No change	No change
Anchor	No change	Sail	No change	No change	No change	Ship
Buckle	No change	No change	Belt	Belt	No change	No change
Mane	No change	Horn	Cat Whiskers	No change	No change	No change
Panel Screen	Bunk Bed	No change	No change	No change	No change	No change
Hoof	No change	Chicken feet	Chicken feet	No change	No change	No change
Door Bolt	No change	Padlock	Door Handle	No change	No change	No change

Alternating verbal fluency

Instructions: The participant is asked to alternately generate as many different words as possible beginning with the letter 'S' and words describing articles of clothing during 60 seconds. Participants are instructed not to use proper nouns or to repeat the same word with a different ending (e.g., swim, swimming, swimsuit).

Scoring: 1 point for each correct answer maintaining the alternation between words beginning with 's' and articles of clothing. (0-20)

Example:… *sand, trousers,* coat, *sun, jumper*… Although five words have been provided, only two alternations have been made (in bold and italics). So, the number of correct words in this case would be 4.

All Indo-European languages and Malay for Singapore kept the letter "S" word generation system.

The other languages, used other letters or characters:
- Japanese used the character か (ka)
- Chinese (Singapore and Taiwan), the character 中
- Arabic, the letter ل (equivalent to l)
- Tamil, the compound form க (ka)
- Hebrew, the letter ק (qoph - :/k/)

Conclusions

The specificities of the PD-CRS prompted the translation team to modify the standard linguistic validation process to develop culturally appropriate translations.

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