RESEARCH REPORT

International Journal of Language & Communication Disorders

Cultural adaptation and psychometric analysis of Communication Activities of Daily Living third edition in Spanish and Catalan for people with aphasia

Clàudia Roca | **Ignasi Ivern** | **Ignacio Cifre** | **Olga Bruna**

Ramon Llull University, FPCEE
Blanquerna, Barcelona, Spain

Correspondence
Clàudia Roca, Ramon Llull University,
FPCEE Blanquerna, Barcelona, Spain.
Email: claudiarh@blanquerna.url.edu

Abstract

Background: In the Spanish and Catalan context, there is currently a lack of standardized, linguistically adapted tools to assess people with communication disorders. This lack is especially evident when it comes to instruments designed to assess functional communication.

Aims: The main objective of this study is to adapt the instrument entitled *Communication Activities of Daily Living* 3rd edition (CADL-3) into European Spanish (CADL-3VE) and Catalan (CADL-3VC), thus providing a new tool to assess the functional communication of patients with aphasia in the Spanish and Catalan populations.

Methods & Procedures: A total of 152 people, all residents of Catalonia, took part in the study. The CADL-3VE test was administered to 125 Spanish-speaking participants, who were divided into two groups, one consisting of patients with aphasia and the other a control group. The CADL-3VC test was administered to 27 Catalan-speaking patients with aphasia. Other tests and assessment scales were used for the external validation of the test.

Outcomes & Results: Reliability scores were recorded for both new versions of the test. There was a very strong correlation between the CADL-3VE test and external criteria. The scores for both of the new versions showed significant differences in terms of performance between the aphasia and control groups. Both versions displayed similarities with the original test with respect to most of the psychometric analyses carried out.

Conclusion & Implications: The test makes it possible to assess everyday communicative functioning and participation in real-world contexts. As such, it helps inform the creation of personalized, interdisciplinary treatment plans aimed at functional objectives that consider the patient's context.

WHAT THIS PAPER ADDS

What is already known on the subject

- In order to effectively assess aphasia based on a bio-psycho-social perspective, it is necessary to examine functional communication. In other words, there is a need to explore the kinds of communication difficulties that people face in their everyday lives. *Communication Activities of Daily Living* (CADL-3) is an English-language test that was developed to assess functional communication by simulating certain everyday activities.

What this study adds

- This paper offers an analysis of the items, reliability and validity of the Spanish and Catalan versions of the CADL-3 test.

What are the clinical implications of this work?

- This new instrument has the potential to play an essential role in assessing the everyday functional communication of people with aphasia in Spain.

INTRODUCTION

Recent years have seen significant progress in research into the assessment of aphasia, but these advances have not been evenly distributed among countries (Beveridge & Bak, 2011). While a wide range of diagnostic tests are available in the English-speaking world, there remains a need for instruments to be translated into other languages and adapted to be used in other cultural contexts (Ivanova & Hallowell, 2013). Even on the occasions when such adapted versions are available, they are rarely up to date enough to provide a thorough assessment of communication and language. In Spain, for example, there is a clear lack of suitable assessment tools, especially when it comes to instruments that measure functional communication abilities. In other words, more tools are needed to assess the ability of people with aphasia (PWA) to communicate effectively in the context of everyday activities and situations (Armstrong et al., 2013). The situation in Spain is further complicated by the coexistence in the country of four languages, namely, Spanish, Catalan, Basque and Galician. There are some existing Spanish-language tests that measure the degree of language deterioration in PWA and that examine the emotional states of these individuals, but there is no standardised instrument in this language to assess functional communication. Meanwhile, few, if

any, tests are available in the minority languages spoken in the country. The absence of these instruments means that many people cannot be assessed in their native languages.

Instruments designed to assess language use in aphasia are valuable in that they are often able to paint a detailed picture of the gravity and specific type of the disorder in a given case. Such instruments tend to measure spontaneous speech, comprehension, repetition, word retrieval, reading and writing. However, a biopsychosocial approach demands a test that goes beyond the kinds of formal data gathered in these traditional tests. Embracing such an approach means attempting to learn how the person with aphasia deals with real-life interactions and communicative situations. Starting in the early 1980s, a number of researchers have adopted this perspective and have argued in favour of adding more pragmatic elements to the clinical assessment of people suffering from brain damage, with some highlighting the clear need for new instruments to assess the functions of communicative competency (Holland, 1980; Lomas et al., 1989). Researchers have specified that such tests would need to be able to assess how people understand and transmit messages through verbal and nonverbal communication, without regard to grammatical structure (Aten et al., 1982; Holland, 1991; Ruiter et al., 2011). By doing so, these instruments would shed light on how language disorders affect people's ability to

communicate in real-world contexts, thereby providing information that could inform the planning of treatment with the goal of improving everyday communication (Hartley, 1990).

Some studies on aphasia have analysed the disorder within the framework of the World Health Organization's International Classification of Functioning, Disability and Health (ICF) (WHO, 2001). Such studies have often sought to identify the factors that allow PWA to continue to be satisfied with their lives, with a special focus on everyday activities and social participation (Brown et al., 2011; Worrall et al., 2017). This body of research has led to a paradigm shift in the assessment and treatment of language disorders, as greater priority is now given to exploring the functions of communicative competency and, in turn, to examining the effects on people's overall well-being and quality of life (Holland, 1992). The clinical guide published by the Royal College of Speech and Language Therapists (RCSLT, 2005) indicates that the diagnosis of aphasia should be carried out in accordance with the ICF (WHO, 2001), and it sets out a series of steps that should be included in the process: the detection of the individual's degree of language deterioration, the detection of their functional communication abilities and a test of psychological well-being.

Some conventional aphasia assessment instruments have been adapted and validated for their use in Spanish. For example, the *Test de Boston para el diagnóstico de la afasia* (TBDA) (Garcia-Albea et al., 1996) (and others that had been created in Spain, such as the *Test Barcelona* (Peña-Casanova, 2005)) are aimed at detecting neurolinguistic changes, which are seen as indicators of certain established clinical profiles in accordance with a patient's symptoms. This semiology is used to establish a diagnosis. Moreover, a number of studies have examined the suitability of different kinds of pragmatic tests. For example, Prutting and Kirchner (1987), along with other researchers such as Gerber and Gurland (1989), advocate more observation-based theories, which recognise that a wide range of elements have roles to play in pragmatic interactions. More recent years have seen the appearance of newly created Spanish-language tools that assess pragmatic behaviours. For example, the *Protocolo Rápido de Evaluación Pragmática Revisado* (Fernández-Urquiza et al., 2015) and the *Cuestionario de Valoración Pragmática* (Gallardo-Paúls, 2009) are tests that allow for the observation of various pragmatic elements that patients use to communicate. Additionally, the *Protocolo de exploración de habilidades metalingüísticas para pacientes afásicos MetAphAs* (Rosell-Clari & Hernández-Sacristán, 2014) is designed to assess the interrelations between executive functioning and language. However, observational techniques are unlikely to capture all of a patient's communication skills, as data gathering is often limited to the recording of a specific conversation at a given moment. Additionally, while it is true that conversational methodologies make use of a natural format, the results can be less representative due to the strong potential for sampling error. In short, while observational tests conducted in the form of conversation may be useful in helping to plan interventions, they are not able to yield quantitative results, nor can they provide an objective assessment of a patient's improvements (Manochiopinig et al., 1992).

Nowadays, the most frequently used pragmatic tests tend to assess communicative competence in real-life situations or to simulate these situations in a specific context. For example, the *Porch Index of Communicative Abilities*, which was adapted into Spanish in 1991, is designed to yield a quantitative measurement of a person's gestural, verbal and graphical skills using 10 common objects. However, even the author of this Spanish version has expressed doubts about whether the instrument in fact offers an accurate measurement of functional communication or whether it is more a measurement of certain language functions (Sangorrín, 1991). Manning and Martín (1992) observed the need for assessment instruments that were able to produce a more functional quantitative measurement of both verbal and nonverbal communication skills. Therefore, they created a Spanish version of the *Communication Activities of Daily Living* (CADL), based on the Italian version by Pizzamiglio et al. (1984). However, this test was never published or used with a Spanish-speaking population. In other words, there are currently no objective, quantitative tools in use in Spain to assess the functional communication of PWA within their social context.

Tests designed to measure communicative efficacy are especially useful when it comes to evaluating the results of treatment. Such instruments can be especially of interest when they are able to create situations wherein professionals can measure functional communication through standardised procedures. These tests give professionals the opportunity to conduct quantitative analyses of a patient's behaviour in a simulated everyday situation. Thus, it is possible to identify the kinds of situations in which the patient faces difficulties (Holland, 1980; Lomas et al., 1989). Such instruments are also able to provide useful information on a patient's improvement over time, as they can determine which of the skills practised in a clinical setting can be applied in everyday life (Manochiopinig et al., 1992). Finally, the valuable information that these tests provide about a person's social context can help in the planning of therapy and in the setting of realistic goals.

Holland did pioneering work in the development of a test that assesses the everyday communication skills of PWA. The original publication of the CADL test in 1980

was a response to the growing scientific consensus that the assessment of aphasia should take into account the patient's communication within his or her social context. As the CADL came into broader use, there was a significant increase in the body of research on communication skills. This period also saw growth in the number of studies that recognised the importance of assessing and treating communication difficulties in a natural social setting, and of teaching patients communicative strategies to strengthen their pragmatic abilities and improve their interactions. Later, Holland et al. (1999) created a second version of the instrument, called CADL-2. They ensured that the items covered the whole range of functional communication that affects adults with neurological disorders, and they sought to create items capable of generating specific behaviours. Nearly 2 decades after that, Holland et al. (2018) used the same procedure to publish the third version of the test under the title CADL-3. In this newer version, just as in the earlier ones, the introductory text of the items is used to situate the participant in a certain context, and each item then goes on to test the participant's skill and capacity to communicate functionally in the given everyday situation.

CADL-3 is made up of 50 items, divided into seven categories:

- Reading, writing and using numbers.
- Social interaction.
- Contextual communication.
- Nonverbal communication.
- Sequential relations.
- Humour, metaphor and absurdity.
- Internet basics.

All items related to everyday situations are presented using photographs. Each response is assigned a score of 0, 1 or 2, according to whether it is deemed *incorrect, incomplete/insufficient* or *correct*, respectively. The tool was validated and standardised with a sample of 115 patients with brain damage and 49 participants without brain damage, recruited from 13 states in the United States. The results of the item-wise analysis conducted using a biserial correlation coefficient showed that 98% of the items displayed acceptable levels of discrimination, meaning that they effectively discriminated between high and low scores. In terms of reliability, the test demonstrated high internal consistency, $\alpha = 0.94$. It also demonstrated high test-retest reliability intraclass correlation coefficient (ICC) = 0.94 ($n = 22$) ($p < 0.001$), with a mean of 98 ($SD = 16$) on the first testing and a mean of 104 ($SD = 16$) on the retest. The interrater concordance coefficient for the test taken was excellent, ICC = 0.99 ($n = 50$) ($p < 0.001$), which represents convincing evidence that the CADL-3 is not susceptible to significant errors emerging from discrepancies

between examiners. The degree of correlation between the CADL-3 and *Western Aphasia Battery-Revised*'s Aphasia Quotient was found to be very high (0.79 corrected and 0.74 uncorrected). Finally, when it came to differences among groups, the scores of those without aphasia were significantly higher than participants with aphasia ($M = 100$ vs. $M = 119$, respectively).

The research described here was undertaken out of a desire to contribute to improvements in the assessment of aphasia. To this end, we have sought to adapt and validate CADL-3 for use in the Spanish and Catalan contexts. The process has been carried out in accordance with International Test Commission (ITC, 2017) guidelines for the cultural adaptation of tests. The test allows professionals to assess patients' current level of functioning and to monitor changes over time.

Objectives

The CADL-3 was adapted into European Spanish under the title *Communication Activities of Daily Living* 3rd edition Spanish version (CADL-3VE). It was also adapted into Catalan under the title *Communication Activities of Daily Living* 3rd edition Catalan version (CADL-3VC). The objective of this study was to analyse the items on the test, to evaluate its reliability (specifically in terms of internal consistency, interrater reliability and test-retest reliability) and to examine its validity based on the relationship of the results with certain other assessment tools. Finally, a comparison between the participants with aphasia and a control group was carried out in order to determine whether the groups displayed significant differences in terms of functional communication.

METHODS

Design

The study made use of a cross-sectional, quasi-experimental design (given that non-random sampling was used) to objectively assess the psychometric properties of the CADL-3VE and CADL-3VC tests.

Participants

Prior to the main study, a pilot study ($n = 25$) was conducted to examine the acceptability of the Spanish and Catalan adaptations. Participants in the initial pilot study group were undergoing rehabilitation at a public hospital in Barcelona. Subsequently, we broadened the sample by
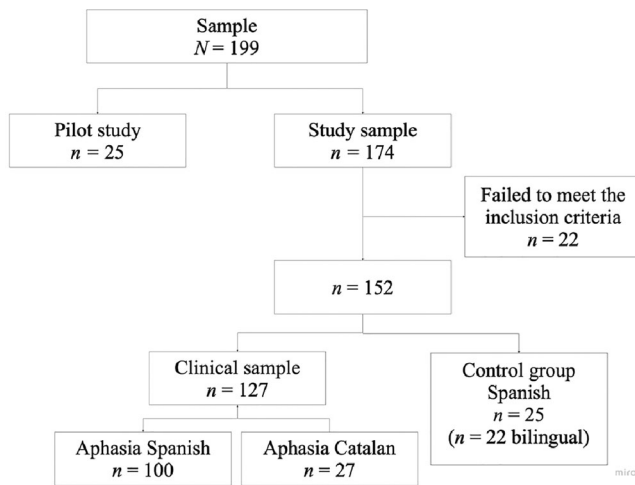
FIGURE 1 Sample recruitment.

recruiting new participants to take part in the final study. The sample for the main study ultimately consisted of a total of 152 adults between 21 and 95 years of age, split into two groups: a control group of individuals without any signs of language difficulties and a clinical sample of PWA. All the participants in the control group speak Spanish as their main language, and 88% of them ($n = 22$) identify as bilingual speakers, equally fluent in Spanish and Catalan. The bilingual control group members reported that their answers would have been the same had the test been administered in Catalan rather than in Spanish. The clinical sample was in turn divided into two groups: one made up of Spanish-speaking participants with aphasia, and one of Catalan-speaking participants with aphasia (Figure 1).

The inclusion criteria for the control group, established prior to the recruitment of the sample, called for adult participants who: did not have any untreated hearing or vision difficulties and did not display any observable signs of cognitive impairment. Meanwhile, the inclusion criteria for the clinical sample called for adults who were experiencing aphasia resulting from acquired brain damage (as determined by an expert professional) and for whom a period of at least a month had elapsed between the episode causing brain damage and the administration of the test. A total of 22 participants were excluded from the final sample, nine because they displayed levels of general language deterioration that implied a lack of communicative intention and/or auditory comprehension, two because they displayed a lack of understanding of the role-playing activities or an unwillingness to participate in them, four because they indicated that their native languages were not Catalan or Spanish, two due to language difficulties associated with degenerative disorders and five because their personal data could not be collected.

The members of the clinical group ($n = 127$) were selected from among those who had consented to participate in the study. The participants were recruited from different health services and institutions throughout Catalonia. The members of the control group were recruited from among the spouses of the participants in the clinical group and the nearby general population, as well as from attendees of an activity centre for older people in Barcelona.

The study collected data on a number of sociodemographic variables, as well as variables connected to the participants' clinical histories (Table 1).

Instruments

The following tests were administered to collect the data necessary to meet the objectives of this study: CADL-3VE, CADL-3VC and *Test de Boston para el diagnóstico de la afasia Language Competency Index* (TBDA$_{ICL}$) (Garcia-Albea, et al., 1996).

Either the CADL-3VE or the CADL-3VC was administered to each participant as the main instrument in the study. The two adapted versions maintain the structure of the original English-language CADL-3. The materials used in each version of the test consist of the examiner's form, the answer sheet and the stimuli notebook.

Procedure and data collection

Prior to adopting the test CADL-3, we first sought out permission from the main author of the original test, Dr. Audrey Holland. Subsequently, we found that the publisher Pro-Ed controlled the intellectual property rights over CADL-3. Via the overseas copyright department of this company, official permission to use the instrument for this study was obtained.

We went on to adapt the test by translating it into the languages of the target population, with a focus on meaning and on the linguistic and cultural issues we believed could arise in connection with the items themselves, the associated images, and the choice of responses. The adaptation into Spanish and Catalan was carried out using the back-translation method (Brislin, 1986) by two translators at the Blanquerna-Universitat Ramon Llull Faculty of Psychology, Educational and Sports Sciences. The two translators (hereinafter referred to as translator A and translator B) worked independently of one another, one on the English-Spanish and English-Catalan translations, and the other on the Spanish-English and Catalan-English back-translations. Translator A was a native speaker of Catalan and Spanish and was thus able to create versions

TABLE 1 Sociodemographic and clinical characteristics of the control group and the clinical sample.

Variables	Control group n = 25	Clinical sample n = 127	
		Aphasia Spanish n = 100	Aphasia Catalan n = 27
Gender [%]			
Male	11 [44]	55 [55]	17 [63]
Female	14 [56]	45 [45]	10 [37]
Age (years) M (SD)	54.64 (17.85)	61.83 (14.20)	60.52 (16.77)
Men	54.55 (21.24)	63.20 (13.30)	58.82 (14.67)
Women	54.71 (15.52)	60.16 (15.21)	63.40 (20.39)
Schooling/education [%]			
1	3 [12]	30 [30]	7 [25.9]
2	6 [24]	36 [36]	6 [22.2]
3	5 [20]	20 [20]	2 [7.4]
4	11 [44]	14 [14]	12 [44.4]
Evolution [%]			
Acute (>3 months)		2 [2]	0 [0]
Subacute (3–12 months)		52 [52]	6 [22.2]
Chronic (<12 months)		46 [46]	21 [77.8]
Language affectation–Boston test [%]			
0 points		0 [0]	0 [0]
1 point		24 [24]	10 [37]
2 points		21 [21]	2 [7.4]
3 points		18 [18]	5 [18.5]
4 points		33 [33]	10 [37]
5 points		4 [4]	0 [0]
Type of aphasia [%]			
Fluent-impaired comprehension		5 [5]	0 [0]
Nonfluent–good comprehension		38 [38]	3 [11.1]
Nonfluent–impaired comprehension		28 [28]	13 [48.1]
Anomia		29 [29]	11 [40.7]

Notes: Schooling/education: 1 = attended school up to 12 years of age; 2 = attended school up to 16 years of age; 3 = attended school up to 20 years of age; 4 = university degree, master's degree or PhD.
Abbreviations: *M*, mean; *n*, number of participants.

of the test in these two languages that reflected contemporary usage in Catalonia. Using the version produced by the back-translation, the researchers worked with translator B, a native English speaker residing in Catalonia with extensive knowledge of Catalan and Spanish culture, to arrive at a consensus version. Translators A and B are experts in the languages involved and have a great deal of familiarity with American, Catalan and Spanish culture, but they are not experts in the contents or in the overall subject matter of the test. In order to minimise the potential for flaws and risks that is inherent in the reliance on individual translations, the study followed the recommendations of Muñiz et al. (2013). We enlisted a committee of eight professional specialists in aphasia from a range of disciplines to analyse the adapted version and help ensure the test's linguistic accuracy. The changes they suggested informed the creation of the second version of the test. Finally, the

pilot study made it possible to detect, analyse and correct issues related to the test's adaptation, thus informing the drafting of the final version of the test.

As the adaptation was being carried out, ethical approval was obtained from the ethics committees of the institutions and health services involved. The research was ultimately carried out by the principal author of the study with the assistance of qualified collaborators and under the supervision of qualified professionals. All those responsible for administering the instruments were provided with training in the use of the CADL-3VE and CADL-3VC. To administer the testing instruments, appointments were made with those who had expressed a willingness to participate. An information and data collection protocol designed especially for this study was used, specifically featuring a study information sheet and informed consent. Then, a selected series of subtests was administered only

to the Spanish-speaking participants ($n = 26$) to obtain the scores for the TBDA$_{ICL}$.

The testers followed the procedure established in the original test in English, starting with an oral explanation of the testing procedure and the issuing of instructions. The examiners also made sure that the patients were able to see the visual materials and that they had easy access to the resources they tended to use to communicate in their everyday lives (such as tablets, notebooks or cell phones). The instructions were repeated as many times as necessary, and clarifications were offered to resolve any questions.

The tests were carried out on an individual basis in a quiet space, in sessions lasting between 30 and 45 min. To assess test-retest reliability, willing participants ($n = 18$) were invited to an additional session, and the CADL-3VE or CADL-3VC was readministered. Meanwhile, two of the four administrators were enlisted as raters to ensure interrater reliability. This analysis was carried out via observation of the administration of the test by a second examiner, who scored the participants' answers along with the examiner conducting the test.

Psychometric testing and data analysis

Firstly, we calculated the percentage of the participants who had answered each item correctly to determine the items' degree of difficulty. This concept was expressed as a number between 0 and 1, with acceptable items falling in the range between 15% and 85%. Meanwhile, we calculated the point-biserial correlation coefficient to determine the degree to which the items served to identify the individual differences between the participants in terms of the variables measured. We chose to use the point-biserial correlation coefficient because we believe, in accordance with the authors of the original test, that this is the most suitable method in cases when the results of the items are expressed as one of three possible values and the overall score is continuous (Muñiz, 2003). The resulting coefficient can range from −1 to 1, with 0 indicating that there is no correlation between the variables under comparison. We elected to use the same reference values as the authors of the original instrument, who established that results above 0.20 represented an acceptable degree of correlation (Ebel, 1965). Finally, we analysed the variance of each item.

To conduct the reliability analysis, we first analysed the internal consistency of the CADL-3VE and the CADL-3VC. Then, we examined the test-retest stability and attempted to identify any differences between raters. Participants completed the test a second time 7–30 days after the first assessment. Instruments are considered to have an acceptable degree of test-retest reliability if this coefficient reaches a value above 0.90. Similarly, when the interrater

coefficient is greater than 0.90, the test is said to have an acceptable level of inter-rater agreement (Nunnally & Bernstein, 1994; Salvia et al., 2017).

This study made use of concurrent criterion validity, meaning that the CADL-3VE or CADL-3VC test data were collected at the same time as the external measurements (in this case, the severity rating scale of the TBDA and the classification of the degree of aphasia according to the National Institutes of Health Stroke Scale [NIHSS]). Additionally, the data for the CADL-3VE and the information for the TBDA$_{ICL}$ were gathered within the same time frame. The magnitude of the coefficients can be interpreted and classified as either very low (from 0 to 0.09), low (from 0.10 to 0.29), moderate (from 0.30 to 0.49), high (from 0.50 to 0.69), very high (from 0.70 to 0.89) or nearly perfect from (0.90 to 1) (Hopkins, 2002).

Finally, non-parametric tests were used. A comparative analysis was carried out using the Mann–Whitney U test to compare independent groups (aphasia group and control group).

RESULTS

Adaptation of the test design

Thanks to the contributions and support of the committee of experts and translator B, we were able to complete the second version of the test for use in the first phase of the study. This version incorporated both changes to the test's format and linguistic and cultural adaptations. It also included alterations or replacements of images and new responses (Table 2).

The pilot phase made it possible to confirm that the instrument had been suitably adapted for use in the Spanish context, thus allowing us to move on to the operational phase of the study. Upon completion of the study with the pilot sample ($n = 25$), we conducted a preliminary reliability analysis and validity study. The results demonstrated high internal consistency ($\alpha = 0.946$) and showed that there was a significant correlation ($r_s = 0.840$, $p < 0.001$) between the scores on the CADL-3VE and those on the TBDA$_{ICL}$. Figure 2 below shows the overall process used to adapt and translate the original test to create the CADL-3VE and the CADL-3VC.

This initial phase yielded some valuable information about the test. It allowed us to confirm that the participants' reactions over the course of the test were highly positive. We were also able to establish that examiners needed to have access to ways to reformulate certain questions, specifically in the cases of six items that tended to give rise to confusion or lack of understanding. Additionally, we recognised the need for tangible support materials

TABLE 2 Type of adaptation.

| Adaptation type	Example	
Linguistic	Modification of words or addition of words to an item, without altering the meaning	'Football game' instead of 'game'
Cultural	Changes to adapt the test to the cultural context to the target population	'Euros' instead of 'dollars'
Format	Introduction of tangible materials	Use of personal cell phone
Edited image	Partial modification of an image that maintains most of the original	Names of streets on the map 'Km' instead of 'miles'
Replaced image	Overall replacement of an image for the purposes of cultural adaptation	'Roundabout' instead of 'railway crossing'
Response	Changes in responses for the purposes of cultural adaptation, and the introduction of new possible responses to be scored 2 and/or 1	Patient requests text to be read aloud.
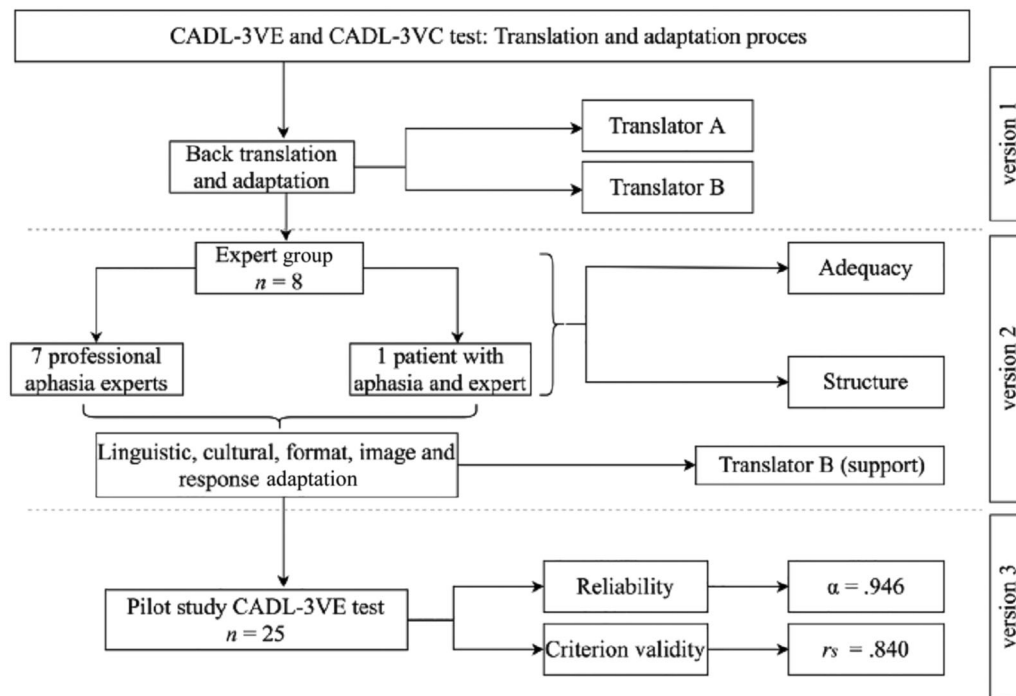
FIGURE 2 Translation and adaptation of the CADL-3VE and CADL-3VC test. *Note*: n = number of participants. α = Cronbach's Alpha coefficient. r_s = Spearman's correlation coefficient.
Abbreviations: CADL-3VC, *Communication Activities of Daily Living* 3rd edition Catalan version; CADL-3VE, *Communication Activities of Daily Living* 3rd edition Spanish version.

on two of the items, specifically, an analogue clock and the patient's own cell phone. Finally, the pilot test was a chance to confirm the scoring criteria for each item (and for four items, more specific or additional responses were added). Beyond the results themselves, the pilot process produced some qualitative observations. Firstly, many participants and their families took advantage of the various opportunities afforded by the test to tell the professional about the kinds of everyday situations where the patient experienced difficulties. Secondly, patients exhibited satisfaction at their ability to respond to the items,

whether verbally or non-verbally. Based on the information gathered in the piloting process, we were able to define the third version of the CADL-3VE and CADL-3VC tests.

Subsequently, we calculated the distribution of the dependent variable, the final score on the CADL-3VE or CADL-3VC, using the Kolmogorov–Smirnov statistical test. The sample distribution for the Spanish-speaking group with aphasia ($n = 100$) was defined as non-normal. Within these parameters, the sample of Catalan-speaking participants with aphasia ($n = 27$) was also assumed not to

TABLE 3 Internal consistency results of CADL-3VE and CADL-3VC tests.

Categories[n_{items}]	CADL-3VE $n = 100$				CADL-3VC $n = 27$			
	Cron. alpha	SD	SEM_PD	IC_PD 95%	Cron.alpha	SD	SEM_PD	IC_PD 95%
Items [50]	0.943	19.28	4.72	[x ± 4.72 1.96]	0.948	19.97	4.89	[x ± 4.89 1.96]

Abbreviations: CADL-3VC, *Communication Activities of Daily Living* 3rd edition Catalan version; CADL-3VE, *Communication Activities of Daily Living* 3rd edition Spanish version; IC_PS, direct score confidence interval; n_{items}, number of items; n, number of participants; SEM_DS, standard error of measurement of direct score.

be large enough to warrant an examination of the presence of a normal distribution.

Item analysis

The results obtained for the Spanish-speaking and Catalan-speaking samples of PWA can be seen in the Appendix. The point-biserial coefficient indicates that 74% of the items on the CADL-3VE and 70% of the items on the CADL-3VC reached acceptable levels of discrimination (>0.20). In other words, a large percentage of the respondents who answered these items correctly also recorded high overall scores on their respective test, the CADL-3VE or the CADL-3VC. Most of the remaining items, 22% and 18% of those on the CADL-3VE and the CADL-3VC, respectively, were not found to be useful in discriminating between participants because most of the respondents were able to answer them correctly, with a coefficient of variance of less than 0.15. Finally, the rest of the items (4% and 12% of the two tests, respectively) were not found to have acceptable levels of discriminatory power, meaning that they were less useful when it came to distinguishing between participants with higher or lower overall scores.

Reliability analysis

To analyse the tests' internal consistency, we considered the following: the intercorrelation between the elements, calculated via Cronbach's alpha; and the standard error of measurement (see Table 3).

It should be noted that each item contributes its specific weight to the overall internal consistency of the CADL-3VE or the CADL-3VC. Therefore, calculations were carried out for each item to determine what the Cronbach's alpha value of the test would be if that item were eliminated. The analysis of the resulting values shows that nearly all the items contribute to the overall consistency of the instruments. In the case of the CADL-3VE, the exceptions were items 13, 26 and 49, which did not make positive contributions to the internal consistency of the test. On the CADL-3VC, meanwhile, items 2, 12, 13, 21, 24, 26 and 34 were found not to contribute to the overall internal consistency.

We continued by measuring the stability of the new versions of the test and identifying any differences between raters. For the purposes of this analysis of stability and interrater agreement, we opted to combine the two samples of participants with aphasia (Spanish and Catalan speakers) into a single group, because the difference between the Spanish and Catalan versions is not clinically significant.

The test-retest reliability coefficient for the tests ($n = 18$) was 0.985 ($p < 0.001$), with a mean of 64 ($SD = 18.99$) on the first test and a mean of 66.50 ($SD = 18.48$) on the retest. The test-retest reliability coefficients indicate a significant correlation. Thus, we can confirm that the results of the CADL-3VE and CADL-3VC tests remain stable over time. The interrater concordance coefficient for the test ($n = 18$) was 0.989 ($p < 0.001$), which represents convincing evidence that the CADL-3VE and CADL-3VC do not display significant errors due to discrepancies between examiners.

Validity study

We obtained coefficients of correlation between the participants' final scores on the CADL-3VE and the CADL-3VC, on the one hand, and their scores on the various external measurements, on the other. Table 4 shows the correlation coefficient between the test and the results of each of the external criteria included in this study.

The correlation coefficient between the results of our test and those of the TBDA$_{ICL}$ indicates a positive correlation of a size that can be classified as very high ($n = 26$, $r_s = 0.756$). Meanwhile, the magnitude of the correlation with the external criterion of the language impairment severity scale, as measured by the TBDA, also indicates strong positive correlations between this measure and both the CADL-3VE and the CADL-3VC ($n = 100$, $r_s = 0.879$; $n = 27$, $r_s = 0.904$, respectively). Finally, the calculation yielded a negative correlation coefficient with the additional external criterion, namely, the classification of impairment in aphasia according to the NIHSS. In this case, the correlation with the CADL-3VE was classified as high, while the

TABLE 4 Correlation coefficient indicating the test-criterion relationship for each external criterion.

External criterion	CADL-3VE			CADL-3VC		
	n	*r_s*	Sig.	*n*	*r_s*	Sig.
TBDA$_{ICL}$	26	0.756[a]	$p < 0.001$	0	–	–
Severity scale for assessing TBDA language impairment	100	0.879[a]	$p < 0.001$	27	0.904[a]	$p < 0.001$
Classification of aphasia severity according to the NIHSS	100	−0.687[a]	$p < 0.001$	27	−0.843[a]	$p < 0.001$

Abbreviations: CADL-3VC, *Communication Activities of Daily Living* 3rd edition Catalan version; CADL-3VE, *Communication Activities of Daily Living* 3rd edition Spanish version; n, number of participants; rs, Spearman correlation coefficient; Sig., significance; TBDA, *Test de Boston para el diagnóstico de la afasia*; TBDA$_{ICL}$, *Test de Boston para el diagnóstico de la afasia Language Competency Index*.

[a]The correlation is significant at the 0.01 (bilateral) level.

correlation with the CADL-3VC was in the very high range ($n = 100$, $r_s = 0.−687$; $n = 27$, $r_s = 0.−843$, respectively).

Group comparison

The participants with aphasia were expected to record lower scores than those in the control group for functional and communicative ability, as measured by the CADL-3VE and the CADL-3VC. This expectation was fulfilled, as the mean score on the CADL-3VE obtained by the participants with aphasia ($n = 25$) was 69.05 ($SD = 19.28$), lower than that of the CADL-3VE control group, whose members registered a mean score of 96.92 ($SD = 3.64$). On the Catalan version of the test, the mean score recorded by the participants with aphasia ($n = 22$) was 71.04 ($SD = 19.97$), while the bilingual members of the control group registered a mean score of 97.50 ($SD = 3.25$). The Mann–Whitney *U* test indicated significant differences ($p < 0.001$) between the control group and the two clinical samples.

DISCUSSION

Efforts to help PWA maintain a satisfactory quality of life have attracted the interest of a number of researchers in recent years. The well-being of PWA depends largely on social and psychological factors (Worrall et al., 2017). Therefore, it is of the utmost importance to have access to standardised, rigorous tools to assess the functional communication abilities of people with this disorder, and this adaptation of the CADL-3 was an attempt to address this need.

Respondents to the CADL-3VE and the CADL-3VC are asked to complete tasks designed to represent some of the most common communication situations that emerge in the everyday lives of Spanish- and Catalan-speaking people in Spain. The authors of the CADL-3VE and the CADL-3VC followed the same steps as the authors of the original

test, which helped ensure that the items of these adapted versions were representative of our context.

It should be noted that the results of the pilot study suggested that the items on the CADL-3VE are a relevant and representative means to measure the construct of functional communication, that the contents of the items were suitable for the target population and that the specific instructions issued were clear and easy to understand. This piloting process was also useful in helping ensure that the responses were a good fit with the Spanish population, and the experience sometimes prompted us to widen the range of acceptable answers, thus facilitating the examiner's correction tasks.

Meanwhile, the results of the final study fully support the reliability and validity of the CADL-3VE and CADL-3VC tests. Firstly, the results of the item analysis of the CADL-3VE and CADL-3VC indicated that the items on the tests had varying degrees of difficulty. The presence of both easier and more difficult items allows the test to distinguish more effectively between participants. Specifically, the item difficulty index shows that 22% and 24% of the items on the CADL-3VE and the CADL-VC, respectively, were answered correctly by the majority of the participants. A very similar percentage of the items on the original CADL-3 test were answered successfully by most respondents. The specific items with a greater percentage of correct answers on the CADL-3VE and the CADL-VC coincided with those on the original test at rates of 73% and 70%, respectively. From a qualitative perspective, the presence of items that are easier for the participant might both help ensure that the whole test will be completed and produce a positive effect in terms of the participant's feeling of satisfaction. Other items, 26% and 30% (respectively) of the new Spanish and Catalan versions, displayed point-biserial coefficients of correlation of <0.20, indicating a lack of discriminatory power. In other words, these items do not effectively discriminate between participants with higher and lower overall scores. It should be noted that correlation coefficients are sensitive to the variability of data,

which could have affected the results for certain items. In any case, it is worth noting that the responses to the different items can be affected by any number of variables. One example of this could be a person who performs well on the test but, due to his or her age, might not be familiar with new technology and, as such, might score lower on the items related to internet basics. Another example might be in the items that involve humour, metaphor or absurdity, the interpretation of which might be more associated with ageing, with the specific location of a respondent's brain damage, or with any other development disorder related to theory of mind rather than with the person's overall performance on the test.

The second area of psychometric analysis was the test's reliability and validity. The results with regard to the internal consistency of the two new versions of the test, the CADL-3VE and the CADL-3VC, indicate that these instruments are sensitive enough to measure the communicative competence of adults with aphasia. These internal consistency results are very similar to those obtained for the original test (Holland et al., 2018). The test-retest analysis took into account both the time elapsed between the two tests and the evolution of the participants. It was considered unwise to administer the retest immediately after the first test, as working memory and fatigue are significant variables in the target population. Thus, the patients in the subacute stages of aphasia took the CADL-3VE or the CADL-3VC a second time after a period of between 7 and 20 days had elapsed from the first administration of the test. Patients with chronic aphasia retook the test after a maximum period of 30 days, in order to prevent the results from being influenced by possible improvements or evolutions in their condition, or by other social or personal factors. Agreement between raters was also analysed, and results showed convincing evidence that the CADL-3VE and CADL-3VC do not display significant errors due to discrepancies between examiners. However, it should be stressed that future raters should become familiar with the scoring guidelines before administering and scoring tests, and that they should follow these guidelines closely.

When it came to the relationship between the new test and other variables, we believe that the correlations between the scores on the CADL3-VE and the CADL-3VC and those recorded for other assessment tools are consistent with the interpretation of these scores that we suggest. Prior studies have shown that assessments of the functionality of communicative competence tend to be similar to results of language-based assessments (Frattali et al., 1995; Laska et al., 2007; Meier et al., 2017), but that sometimes the measurements of these two phenomena can differ. For example, Lomas et al. (1989) concluded that scores on *The Communicative Effectiveness Index* did not correlate with results on the *Western Aphasia Battery* (Kertesz, 1982). As the authors observed, this finding is not surprising, given that the settings of everyday communication are often accompanied by a whole range of extra-linguistic factors that can ease communication. More functional approaches to assessing communication consider both such extra-linguistic factors and other nonverbal forms of communication (Hartley, 1990). The use of all the possible means of communication (for example, pointing, gestures, writing a message, etc.) is known as total communication (Rautakoski, 2011). If patients with aphasia make use of these alternative or additional means of communication to carry out tests that assess their communicative function, they are likely to perform much better than they would on a strictly linguistic test, which would only assess specific language issues without considering the context.

Finally, a comparison between groups was carried out. The participants with aphasia recorded significantly lower scores than those in the control group.

In light of this, one of the main advantages of having access to the CADL-3VE or the CADL-3VC in the Spanish context is the ability to measure any mode of communication, whether it is verbal, non-verbal or a combination of the two. The test makes it possible to observe and assess the kinds of communication that patients use (such as language, gestures, drawing or use of a device) and how often they use them. The test also shows how easy or difficult it is for them to move between one kind of communication and another. Additionally, it allows professionals to see when their patients need additional help or support. For example, it can help them distinguish between those who are able to understand situations in context and those who are not, and it can help them tell the difference between those who are able to transmit a message and those who cannot, regardless of their verbal communication level. This information is vital for professionals wishing to carry out an assessment based on a biopsychosocial approach. It also helps them plan their interventions by setting goals in light of the patient's real situation and actual everyday communication needs. Furthermore, the information yielded by these tests can help to determine whether a person needs to use an Augmented and/or Alternative Communication System, or, when patients are already using such devices, to assess the extent to which they have chosen the most suitable and efficient options.

Some of this study's limitations lie in the sample itself. It should be noted that the sample required for this study had to come from a specific population, namely, adults with aphasia. Consequently, it is difficult to recruit very large samples. Here, it was considered desirable for the number of Spanish-speaking participants to be very similar to that used in the original English version of the test. In accordance with the instructions of the author of this original version, the sample included here was considered large enough to move forward. It is worth mentioning, though, that recruitment of participants was limited to the

provinces of Barcelona and Girona. Thus, one should take care in interpreting the scores of people from sociodemographic groups that may not have been represented in this study. It is also worth highlighting that the sample of Catalan speakers with aphasia was not large enough, which means that the results should be taken as preliminary and not necessarily as an accurate reflection of the population as a whole.

Additionally, the item-based analysis made clear that some of the items on the CADL-3VE and the CADL-3VC should be reassessed in future studies. Furthermore, it should be noted that in the existing psychometric literature on aphasia there is no measurement that directly assesses the construct of functional communication. That is why this study has examined validity in terms of a single criterion. Nevertheless, it is difficult to establish the validity of the study, as it is not possible to draw precise conclusions about a criterion based on a single test.

Finally, we are aware of the need to continue to adapt and standardise tests of functional communication for use in Spain, both in Spanish and, especially, in the minority languages spoken in the country.

CONCLUSIONS

The CADL-3VE and CADL-3VC have been shown to be useful, valid and reliable clinical tools for the assessment of functional, daily-life communication. Their psychometric properties are in line with previous psychometric findings reported originally by Holland et al. (2018). Thus, this study demonstrates that the tools can be confidently administered to assess the function of communicative competence of PWA as they go about their everyday activities. The instruments can also help professionals to design intervention plans with goals that better reflect the realities of each patient.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID
Clàudia Roca https://orcid.org/0000-0002-8706-1505

REFERENCES

Armstrong, E., Ferguson, A. & Simmons-Mackie, N. (2013) Discourse and functional approaches to aphasia. In: Papathanasiou, I., Coppens, P. & Potagas, C. (Eds.) *Aphasia and related neurogenic communication disorders*. Massachussets, MA: Jones & Bartlett Learning, pp. 217–231.

Aten, J.L., Caligiuri, M.P. & Holland, A. (1982) The efficacy of functional communication therapy for chronic aphasic patients. *The Journal of Speech and Hearing Disorders*, 47(1), 93–96. https://doi.org/10.1044/jshd.4701.93

Beveridge, M.E.L. & Bak, T.H. (2011) The languages of aphasia research: bias and diversity. *Aphasiology*, 25(12), 1451–1468. https://doi.org/10.1080/02687038.2011.624165

Brislin, R.W. (1986) The wording and translation of research instruments. In: Lonner, W.J. & Berry, J.W. (Eds.) *Field methods in cross-cultural psychology*. Thousand Oaks, CA: Sage Publications, pp. 137–164.

Brown, K., Worrall, L., Davidson, B. & Howe, T. (2011) Living successfully with aphasia: a qualitative meta-analysis of the perspectives of individuals with aphasia, family members, and speech-language pathologists. *International Journal of Speech-Language Pathology*,14(2), 141–155. https://doi.org/10.3109/17549507.2011.632026

Ebel, R.L. (1965) Confidence weighting and test reliability. *Journal of Educational Measurement*, 2(1), 49–57.

Fernández-Urquiza, M., Díaz, F., Moreno, V., Lázaro, M. & Simón, T. (2015) *Protocolo Rápido de Evaluación Pragmática Revisado*. Valencia, Spain: Guada Impresores.

Frattali, C., Thompson, C.K., Holland, A., Wohl, C.B. & Ferketic, M. (1995) *Functional assessment of communication skills for adult*. Rockville, MD: American Speech-Language-Hearing Association.

Gallardo-Paúls, B. (2009) Valoración del componente pragmático a partir de datos orales. *Revista de Neurología*, 48(Suppl 2), S57–S61.

García-Albea, J.E., Sánchez-Bernardos, M.L. & Viso, S. (1996) Test de Boston para el diagnóstico de la afasia. Adaptación Española. In: Goodglass, H. & Kaplan, G. (Eds.) *La evaluación de la afasia y de trastornos relacionados* (2ª ed.). Madrid, Spain: Médica-Panamericana.

Gerber, S. & Gurland, G.B. (1989) Applied pragmatics in the assessment of aphasia. *Seminars in Speech and Language*, 10(4), 270–281.

Hartley, L.L. (1990) Assessment of Functional Communication. In: Tupper, D.E. & Cicerone, K.D. (Eds.) *The neuropsychology of everyday life: assessment and basic competencies. Foundations of neuropsychology*, vol. 2. Boston, MA: Springer.

Holland, A. (1980) *Communicative abilities in daily living: a test of functional communication for aphasic adults*. Baltimore, MD: University Park Press.

Holland, A. (1991) Pragmatic aspects of intervention in aphasia. *Journal of Neurolinguistics*, 6(2), 197–211. https://doi.org/10.1016/0911-6044(91)90007-6

Holland, A. (1992) Some thoughts of future needs and directions for research and treatment of aphasia. In: Cooper, J.A. (Ed.), *Aphasia Treatment: Vol.2. Current approaches and research opportunities*. Bethesda, MD: National Institute of Health, National Institute on Deafness and Other Communication Disorders, pp. 147–152.

Holland, A., Frattali, C. & Fromm, D. (1999) *Communication activities of daily living*, 2nd edition. Austin, TX: Pro-Ed.

Holland, A., Fromm, D. & Wozniak, L. (2018) *CADL-3: communication activities of daily living*, 3rd edition Austin, TX: Pro-Ed.

Hopkins, W.G. (2002) A scale of magnitudes for the effect statistics. A new view of statistics. http://www.sportsci.org/resouece/stats/effectmag.html

International Test Commission. (2017) The ITC Guidelines for Translating and Adapting Tests (2ª ed.). www.InTestCom.org

Ivanova, M.V. & Hallowell, B. (2013) A tutorial on aphasia test development in any language: key substantive and psychometric considerations. *Aphasiology*, 27(8), 891–920 https://doi.org/10.1080/02687038.2013.805728

Kertesz, A. (1982) *Western aphasia battery*. New York, NY: Pearson.

Laska, A.C., Bartfai, A., Hellblom, A., Murray, V. & Kahan, T. (2007) Clinical and prognostic properties of standardized and functional aphasia assessments. *Journal of rehabilitation medicine*, 39(5), 387–392. https://doi.org/10.2340/16501977-0070

Lomas, J., Pickard, L., Bester, S., Elbard, H., Finlayson, A. & Zoghaib, C. (1989) The Communicative Effectiveness Index: development and psychometric evaluation of a functional communication measure for adult aphasia. *The Journal of Speech and Hearing Disorders*, 54(1), 113–124. https://doi.org/10.1044/jshd.5401.113

Manning, L. & Martín, P. (1992) Pruebas de la vida diaria en la evaluación de la afasia: El CADL. In: L. Manning (Ed.), *Introducción a la neuropsicología clásica y cognitiva del lenguaje*. Madrid, Spain: Trotta, pp. 335–362.

Manochiopinig, S., Sheard, C. & Reed, V. (1992) Pragmatic assessment in adult aphasia: a clinical review. *Aphasiology*, 6(6), 519–533. https://doi.org/10.1080/02687039208249489

Meier, E.L., Johnson, J.P., Villard, S. & Kiran, S. (2017) Does naming therapy make ordering in a restaurant easier? Dynamics of co-occurring change in cognitive-linguistic and functional communication skills in aphasia. *American journal of speech-language pathology*, 26(2), 266–280. https://doi.org/10.1044/2016_AJSLP-16-0028

Muñiz, J. (2003) *Teoría Clásica de los Tests*. Madrid, Spain: Pirámide.

Muñiz, J., Elosua, P. & Hambleton, R.H. (2013) Directrices para la traducción y adaptación de los tests (2ª ed.). *Psicothema*, 25(2), 149–155. https://doi.org/10.7334/psicothema2013.24

National Institute of Health Stroke Scale (NIHSS). (2018) http://www.amn-web.com/documentos/Escala_NIHSS.pdf

Nunnally, J.C. & Bernstein, I.H. (1994) The assessment of reliability. *Psychometric Theory*, 3, 248–292.

Peña-Casanova, J. (2005) Test Barcelona Revisado. Normalidad, Semiología y Patología Neuropsicológicas. Barcelona, Spain: Masson.

Pizzamiglio, L., Laicardi, C., Appicciafuoco, A., Gentili, P., Judica, A., Luglio, L., Margheriti, M. & Razzano, C., (1984) Capacità comunicative di pazienti afasici in situazioni di vita quotidiana: adattamento italiano. *Archivio di Psicologia, Neurologia e Psichiatria*, 45(2), 187–210.

Prutting, C.A. & Kirchner, D.M. (1987) A clinical appraisal of the pragmatic aspects of language. *The Journal of Speech and Hearing Disorders*, 52(2), 105–119. https://doi.org/10.1044/jshd.5202.105

Rautakoski, P. (2011) Training total communication. *Aphasiology*, 25(3), 344–365. https://doi.org/10.1080/02687038.2010.530671

Rosell-Clari, V. & Hernández-Sacristán, C. (2014) *MetAphAs Test. Metalanguage in Aphasia Assessment*. Valencia, Spain: Nau Llibres.

Royal College of Speech and Language Therapists (RCSLT). (2005) *Royal college of speech and language therapists clinical guidelines*. London, England: Routledge. https://doi.org/10.4324/9781315171548

Ruiter, M.B., Kolk, H.H.J., Rietveld, T.C.M., Dijkstra, N. & Lotgering, E. (2011) Towards a quantitative measure of verbal effectiveness and efficiency in the Amsterdam-Nijmegen Everyday Language Test (ANELT). *Aphasiology*, 25(8), 961–975. https://doi.org/10.1080/02687038.2011.569892

Salvia, J., Ysseldyke, J.E. & Witmer, S. (2017) *Assessment in special and inclusive education*, 13th edition. Boston, MA: Cengage Learning.

Sangorrín, J. (1991) *Adaptación en castellano y catalán del Porch Index of Communicative Ability (PICA)* [Tesis Doctoral]. Barcelona, Spain: Universidad de Barcelona.

World Health Organization. (2001) Clasificación internacional del funcionamiento de la discapacidad y de la salud: CIF: Versión abreviada. https://apps.who.int/iris/handle/10665/43360

Worrall, L.E., Hudson, K., Khan, A., Ryan, B. & Simmons-Mackie, N. (2017) Determinants of living well with aphasia in the first year post stroke: a prospective cohort study. *Archives of Physical Medicine and Rehabilitation*, 98(2), 235–240. https://doi.org/10.1016/j.apmr.2016.06.020

APPENDIX

Difficulty index, discrimination coefficient and variance for each CADL-3VE and CADL-3VC item

CADL-3VE								CADL-3VC							
I	Diff	Dis	V	I	Diff	Dis	V	I	Diff	Dis	V	I	Diff	Dis	V
1	0.98	0.00	0.02	26	0.92	0.00	0.08	1	0.98	0.00	0.02	26	0.91	0.01	0.24
2	0.87	0.21	0.12	27	>0.99	0.00	0.00	2	0.87	0.00	0.11	27	>0.99	0.00	0.08
3	0.87	0.15	0.11	28	0.62	0.27	0.24	3	0.89	0.21	0.10	28	0.65	0.29	0.00
4	0.92	0.40	0.07	29	0.81	0.04	0.16	4	0.85	0.32	0.13	29	0.74	0.23	0.23
5	0.65	0.50	0.23	30	0.70	0.34	0.21	5	0.65	0.54	0.23	30	0.85	0.08	0.19
6	0.49	0.35	0.25	31	0.66	0.59	0.22	6	0.48	0.54	0.25	31	0.76	0.43	0.13
7	0.83	0.25	0.14	32	0.73	0.21	0.20	7	0.91	0.37	0.08	32	0.67	0.43	0.18
8	0.59	0.35	0.24	33	0.71	0.17	0.21	8	0.72	0.23	0.20	33	0.72	0.60	0.22
9	0.67	0.53	0.22	34	0.79	0.19	0.17	9	0.78	0.52	0.17	34	0.91	0.02	0.20
10	0.43	0.38	0.24	35	0.81	0.26	0.15	10	0.46	0.41	0.25	35	0.74	0.57	0.08
11	0.74	0.48	0.19	36	0.60	0.40	0.24	11	0.76	0.41	0.18	36	0.59	0.16	0.19
12	0.69	0.38	0.22	37	0.92	0.43	0.07	12	0.76	0.37	0.18	37	0.85	0.49	0.24
13	0.81	0.14	0.16	38	0.63	0.32	0.23	13	0.80	−0.01	0.16	38	0.57	0.58	0.13
14	0.31	0.41	0.21	39	0.56	0.52	0.25	14	0.43	−0.14	0.24	39	0.56	0.76	0.24
15	0.61	0.46	0.24	40	0.64	0.20	0.23	15	0.70	0.62	0.21	40	0.63	0.22	0.25
16	0.64	0.52	0.23	41	0.45	0.18	0.25	16	0.54	0.39	0.25	41	0.56	0.19	0.23
17	0.86	0.44	0.12	42	0.30	0.28	0.21	17	0.87	0.46	0.05	42	0.35	0.21	0.25
18	0.52	0.50	0.25	43	0.38	0.53	0.24	18	0.54	0.68	0.25	43	0.43	0.52	0.23
19	0.56	0.18	0.25	44	0.66	0.58	0.23	19	0.56	0.47	0.25	44	0.72	0.40	0.24
20	0.58	0.58	0.24	45	0.81	0.21	0.15	20	0.50	−0.02	0.25	45	0.83	0.29	0.20
21	0.83	0.42	0.14	46	0.79	0.21	0.17	21	0.87	0.65	0.11	46	0.81	0.12	0.14
22	0.57	0.45	0.25	47	0.50	0.38	0.25	22	0.52	0.14	0.25	47	0.59	0.65	0.15
23	0.53	0.52	0.25	48	0.89	0.11	0.10	23	0.54	0.53	0.25	48	0.91	0.39	0.24
24	0.86	0.13	0.12	49	0.71	0.14	0.21	24	0.87	0.52	0.11	49	0.76	0.19	0.08
25	0.64	0.44	0.23	50	0.98	0.21	0.02	25	0.61	0.04	0.02	50	0.96	0.25	0.18

Notes: Acceptable difficulty index is defined as between 0.15 and 0.85. Acceptable discrimination coefficient is defined as >0.20.

Abbreviations: CADL-3VC, *Communication Activities of Daily Living* 3rd edition Catalan version; CADL-3VE, *Communication Activities of Daily Living* 3rd edition Spanish version; Diff, difficulty; Dis, discrimination; *I*, item; V, variance.