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ALAPSZAKOS SZAKDOLGOZAT

Csernák Ákos

Anglisztika alapszak

Angol szakirány

2014

A HKR 346. § ad 76. § (4) c) pontja értelmében:

„… A szakdolgozathoz csatolni kell egy nyilatkozatot arról, hogy a munka a hallgató saját szellemi terméke…”

NYILATKOZAT

Alulírott (Csernák Ákos) ezennel kijelentem és aláírásommal megerősítem, hogy az ELTE BTK ..... alapképzés/alapszak ..... szakirányán írt jelen szakdolgozatom saját szellemi termékem, melyet korábban más szakon még nem nyújtottam be szakdolgozatként/záródolgozatként és amelybe mások munkáját (könyv, tanulmány, kézirat, internetes forrás, személyes közlés stb.) idézőjel és pontos hivatkozások nélkül nem építettem be.

Budapest, 20 .....

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aláírás

EÖTVÖS LORÁND TUDOMÁNYEGYETEM

Bölcsészettudomány Kar

ALAPSZAKOS SZAKDOLGOZAT

A kétnyelvű afázia teszt (BAT) rendszere, használata és jövőbeli alkalmazásai.

The Bilingual Aphasia Test (BAT) system. Its use and future directions.

Témavezető:

Dr. Illés Éva

Készítette:

Csernák Ákos

Anglisztika alapszak

Angol szakirány

2014

The Bilingual Aphasia Test (BAT) system. Its use and future directions.

Ákos Csernák

Eötvös Loránd Tudományegyetem

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Abstract

Bilingual aphasia is a form of language impairment with a growing clinical population. Testing methods measuring this disorder include the Bilingual Aphasia Test (BAT), created in 1989 by Michel Paradis. Because of its multilingual test group, successful adaptation of the BAT from one language to another is of paramount importance. This paper explores the system of the BAT by investigating the English and Hungarian versions of the test. The aim of my research is to find test items in the Hungarian version that show inconsistencies with the original ones. A linguistic comparison of the two language versions yielded results that call for a phonetic and morphological revision of the Hungarian BAT. As the scope of the investigation was restricted to select tasks of the test, further research is needed in order to improve the overall cross-language adaptability of the Bilingual Aphasia Test.

Keywords: aphasia, bilingualism, language assessment, language testing

1. Introduction

Bilingualism in general is the ability to speak two languages. Today, bi- or multilingual people outnumber those who speak only one language, and their proportion is predicted to grow with, for example, the endorsement of multilingual education (Tucker, 1999). According to Wei (2000), "one in three of the world's population routinely uses two or more languages" (Wei, 2004, p. 4), and with those included who use multiple languages irregularly, i.e. occasionally, monolingual people will count as "a tiny minority in the world today" (Wei, 2004, p. 5).

With the growing prevalence of bilingualism, aphasia, a language disorder that is a frequent outcome of stroke, will affect more and more bilingual individuals. According to the National Aphasia Association (n.d.), more than 100,000 Americans acquire the disorder each year, making it more frequent than Parkinson's Disease (NAA, n.d., para. 7). Although bilingualism and aphasia have each been under considerable scientific investigation, bilingual aphasia and related testing methods remain to be areas with insufficient research yielding conflicting results. Individuals with bilingual aphasia are a growing clinical population whose rehabilitation needs addressing. Thus, the use of valid and consistent tests is of crucial importance.

The Bilingual Aphasia Test (BAT) is a testing method developed in 1989 by Michel Paradis (Paradis, 1989). In their clinical review of bilingual aphasia, Lorenzen and Murray (2009) describe the BAT as a test that "identifies which language skills and linguistic structures have been affected for each language" (Lorenzen & Murray, 2009, p. 309-310). The BAT has become a frequently used test by aphasia researchers in assessing each language spoken by their bilingual or multilingual aphasic patients. Although the BAT has been met

with both acclaim and criticism, the extent to which the test can be regarded as a reliable means of assessing aphasia remains debated. The BAT is used along with the Aachener Aphasia Test in Fabbro's research (2001) and the Boston Naming Test in Bialystok's (2009), two of my main referenced studies (Fabbro, 2001; Bialystok, 2009). Thus, the BAT seems to be a test complementing, rather than comprising, the entire testing process that a bilingual aphasic patient has to undergo in the rehabilitation process. This suggests that researchers do not or cannot rely only on the BAT when assessing bilingual aphasia, the possible reasons for which will be discussed in this paper.

My research paper intends to investigate how successfully the BAT is adapted across languages phonetically, morphologically, syntactically, and semantically. In so doing, I will mainly examine the English and the Hungarian versions of the test. Based on the results yielded, and in view of the criticism worded by test conductors, I will present suggestions for future amendments to the test.

In my thesis paper, I intend to first define the key terms relevant to the topic. A linguistic evaluation of the Hungarian adaptation of the originally English test is to follow, along with suggestions for necessary amendments. Lastly, the paper will discuss criticism along with amendments and possible future directions of the BAT system.

2. Definition of key notions

A main source of inconsistency regarding the research and testing of bilingual aphasia is that different researchers may define and use basic terms such as *aphasia*, *bilingualism*, and *test validity*, differently. This is important because such ambiguity can influence how patients with bilingual aphasia are categorized in the testing process. For instance, in Fabbro's research (2001), dialects were categorised as languages in their own right, as native speakers of Italian

and those of the Friulian dialect (a dialect of the Italian language) were grouped and tested separately as speakers of two different languages (Fabbro, 2001), while other studies might not allow such categorization. It is also important to note that several research documents used in my thesis paper as reference, use the terms *bilingual*, *multilingual*, and *polyglot*, interchangeably. In order to reduce the chances of misinterpretation in the present document, an explanation of how the key terms are understood in my paper is provided in this section.

2.1 Aphasia

According to Trask (1999), "aphasia is a language disability resulting from damage to the language areas of the brain" (Trask, 1999, p. 150). Depending on the severity of either a stroke or brain injuries, the two most common sources of brain damage that result in aphasia, the level of impairment can vary. Additionally, the exact position of the impact exerted in the brain affects what components of the language become disabled. For instance, Broca's area and Wernicke's area, found in the left frontal lobe and the left temporal lobe, are the language centres of the brain whose damage triggers different types of language loss (Bánréti, 2011). Damage to Broca's area, the part of the brain that is responsible for language production, renders the individual unable to formulate correct grammatical structures (Bánréti, 2011). Patients suffering from Broca's aphasia, therefore, have an intact mental lexicon, because they can speak existing, meaningful words. However, they cannot connect them in an easily understandable way as their command of the rules of grammar is broken. Wernicke's aphasia, on the other hand, suggests an altogether different language disorder. Individuals with this type of aphasia pronounce utterances in a fluent way with a correct production of sounds and intonation. Only the sounds they select form words that do not seem to make sense. This is owing to lesions to Wernicke's area, the centre of language comprehension (Bánréti, 2011).

To further complicate the conditions of those suffering from aphasia, not every type of damage to the brain triggers intellectual disorders along with impaired speech production skills. A brain infection, for example, can cause an individual to have impaired language, while retaining unlimited intelligence (NAA, n.d., para. 19).

It is also important to note that individuals with aphasia are held to be unlikely to recover if aphasia lasts longer than two or three months after the brain damage occurs. Fabbro (2001) distinguishes between three phases in a patient's lifecycle beginning from the onset of aphasia. The first one is the *acute phase,* which lasts for the first month. This is followed by the *lesion phase,* whose duration ranges from four to five months post-onset. The final stage is the *late phase,* which continues for the rest of the patient's life. Although improvement can be maintained through treatment, complete recovery is uncommon and the chances of recovery are dependent on the type and extent of the disorder (NAA, n.d., para. 15). This necessitates the use of tests (for example, the BAT) that assess language damage time efficiently so that language recovery can sooner be stimulated through therapy. As pointed out by Fabbro (2001), "recovery, either spontaneous or following rehabilitation, may continue also during the late phase, though generally less intensively than during the lesion phase" (Fabbro, 2001, p. 203).

Furthermore, owing to dissimilar brain sizes, shapes and constructions in every human, the location and dimensions of the language areas are also bound to vary from patient to patient. Other individual factors influence the position and extent of certain language areas, as well. Among others, a person's handedness can determine in which of the brain's hemispheres Broca's and Wernicke's areas are situated: a left-handed person stands a higher chance of having their centre of language situated in the right hemisphere of their brain (Bánréti, 2011).

2.2 Bilingualism

Bilingualism, the second key term in relation to BAT, is a concept that, similarly to aphasia, allows for a large number of types due to individual differences. According to Grosjean (1994), in terms of linguistics and neurolinguistics, those people are defined as bilingual who use two or more languages in their everyday lives. Still, "debate persists on how best to quantify and qualify, and thus define, bilingualism" (Lorenzen & Murray, 2007, p. 300). Consequently, researchers rely on different distinctions when defining the types of bilingualism. Wei (2004), for instance, distinguishes among over 25 types of bilingualism according to language proficiency, the context in which the languages were learned, and the time passed between the development of each language (Wei, 2004). An age-determined approach by McLaughlin (as cited in Beardsmore, 1986) states that a child exposed to a second language before reaching the age of three has *simultaneous bilingualism*, while *successive bilingualism* means exposure occurring beyond the third year. On its official website, McGill University (n.d.) uses an approach more focused on language use than age and distinguishes among three main types: *co-ordinated*, *compound*, and *late bilingualism* (McGill University, n.d., para. 5-9). A child with *co-ordinated* bilingualism differentiates between each of the two languages spoken without difficulties. This frequently happens to children addressed by parents who each speak their own, different mother tongues. A child with *compound bilingualism*, on the other hand, "cannot detect the conceptual differences between the two languages" (McGill University, n.d., para. 6), resulting from the fact that both parents are bilingual and each speaks to the child "in both languages indiscriminately" (McGill University, n.d., para. 6). If an individual learns a language after the age of twelve, *late bilingualism* takes place.

According to Fabbro (2001), bilingual speakers need not speak their languages on an identical level, nor do these languages necessarily have to be mother tongues. In general, different languages are acquired and used for different purposes and in different domains of life. A person whose mother tongue is Hungarian and uses it at home, with their use of English restricted to academic contexts, would be considered by Fabbro a Hungarian-English bilingual speaker, irrespective of their degree of command of the second language (L1 = Hungarian, L2 = English in this case). In this paper I apply the definition of bilinguals provided by Fabbro (2001) and understand bilinguals as people who speak at least two languages regardless of their level of proficiency and the contexts in which these languages are spoken.

2.3 Bi- and multilingual aphasics

As described above, all the factors introduced in the case of individuals with aphasia or bilingualism vary due to individual differences. When paired with bilingualism, the nature and workings of aphasia become even more complex. Bilingual aphasics can demonstrate different language disorders with a different degree of severity in each language spoken (Fabbro, 2001).

Furthermore, evidence supports that bilingualism strongly affects brain organization: “increased density of grey matter in the left inferior parietal cortex”, a brain region related to the acquisition of vocabulary items, was found in multilingual individuals (Bialystok, 2009, p. 3). Such findings prove the many variables related to bilingual aphasics and support the fact that individual differences require individual approaches to patients. In addition, grey matter density in the brain is present to a greater extent in proficient users of a second language than in a beginner. In assessing bilingual aphasia, such variables could provide clinicians with valuable information. This finding also accounts for why bilingual aphasic patients have to be assessed in both languages rather than just one. Therefore, the use of a test measuring each

impaired language is crucial because the fact that individual differences arguably call for individual tests immediately calls into question whether a regulated testing system, such as the BAT, can serve as a universally applicable test for a highly irregular disorder like bilingual aphasia.

2.4 Test validity and the validity of the BAT

Reliability is one of the core concepts in testing along with validity. In this paper, the BAT is understood as a language test as it measures the language skills of its test group; therefore, this section concerns itself with the reliability and validity of language tests.

Reliability indicates how consistently a test measures, that is, to what extent a test returns the same scores in a test group upon its repetition (Hughes, 1989). In the case of the BAT, a test is usually not repeated owing to time considerations, which renders reliability a rather redundant concept as opposed to validity.

According to Hughes (1989), a language test is valid "if it measures accurately what it is intended to measure" (Hughes, 1989, p. 22). Hughes distinguishes among several types, such as *construct, criterion,* and *content validity,* and highlights the latter as a first priority: "every effort should be made in constructing tests to ensure content validity" (Hughes, 1989, p. 27). Hughes exemplifies *content validity* through a test measuring language skills and claims that such a test is considered valid in terms of content "if its content constitutes a representative sample of the language skills, structures, etc. with which it is meant to be concerned" (Hughes, 1989, p. 22). Additionally, "a proper sample of relevant structures" is needed, which can vary according to what the purpose of the test is (Hughes, 1989, p. 22).

Upon assessing the validity of the BAT, Ruiz (2008) investigated two language versions of the test (the Catalan and the Castilian ones) and arrived at the following conclusion. The two language versions of the BAT have great internal consistency; therefore, the test indeed measures what it is set out to (Ruiz, 2008). Ruiz's study is a referenced document on the validity of the BAT on the official website of the test (McGill University, n.d.). This indicates that the test creator considers cross-language internal consistency of the tasks of the BAT to be equal with the test's overall validity. My investigation in the cross-language adaptability of the BAT section of the present paper investigates the Hungarian and the English language versions of the test, and relies on the ideas of the validity of language tests introduced by Hughes (1989) and those of the validity of the BAT by Ruiz (2008). Accordingly, I will explore to what extent the language sample in the Hungarian BAT is relevant against the English version, and whether the sample items in the separate tasks are consistent with each other. Further comments by researchers on the BAT's validity will be included in the criticism section of my thesis paper.

3. Cross-language adaptability of the BAT

The complete Bilingual Aphasia Test consists of three main parts: Part A, Part B, and Part C, each functioning differently and measuring language comprehension and production. The first two parts are monolingual and thus assess comprehension and production of one language at a time, whereas Part C measures those of language pairs. I decided to investigate cross-language adaptability of the BAT by comparing the English and the Hungarian versions of Part B (Paradis, 1989ab; adapted to Hungarian by Labas-Weber, n.d.). I chose Part B for two main reasons. First, it comprises the largest proportion of the BAT with 377 questions, and thus offers a range of linguistic data wider than the other parts (the complete BAT has 512

questions) (Paradis, 1989a). Second, this part looks to assess the patient's language abilities post-onset by targeting 4 units of language, phonetics, morphology, syntax, and semantics, an approach that renders the section the linguistically most diverse of the three parts. In my evaluation I will move from the smallest unit of language (phonetics) to the largest (semantics in this case, as pragmatics is out of the scope of the BAT) rather than following the task order of the test. I will investigate those tasks that explicitly measure only one unit of language at a time rather than those that combine language units.

As for cross-language adaptation of the BAT, Paradis and Libben (1987) published the book The Assessment of Bilingual Aphasia, where test adaptors can find suggestions on how to adapt the BAT successfully to their needs (Paradis & Libben, 1987). Fabbro's adaptation of the BAT to the Friulian language (2001), for example, indicates that in order to adapt a language sample successfully, the translation of the sample items is of secondary importance to maintaining the internal structure of the language units across languages (Fabbro, 2001). Modification to the meaning of the sample items and the visual stimuli representing these is allowed and encouraged, as long as the given task continues to measure the relevant language skills.

3.1 Phonetics

Two tasks of Part B are concerned explicitly with the assessment of the phonetic skills of the aphasic patient: *Verbal Auditory Discrimination* and *Verbal Fluency*.

Verbal Auditory Discrimination features minimal pairs (words that differ from one another in exactly one sound) read out by the clinician. The aphasic patient then needs to select out of five pictures the one that represents the concept heard before. The exercise

investigates language comprehension through measuring the patient's ability to draw a distinction among sounds uttered by the test administrator.

This task exemplifies the need to adapt the test rather than simply translate it. While the English version contains the words and corresponding pictures representing a "bar", a "car", a "jar", and a "star", the corresponding Hungarian words are clearly not a group of minimal pairs, and thus had to be altered along with the images representing them (Paradis, 1989b, p. 55). For example, the Hungarian version features the words and corresponding images representing "só", "tó", "ló", and "hó", meaning "salt", "lake", "horse", and "snow" (Labas-Weber, n.d., p. 55). In this way, the Hungarian version continues to present minimal pairs to the patient, as required by the test. Deviation from the meaning of the original items is indeed acceptable as long as the linguistic structure of the items remains intact after adaptation. While most items were successfully adapted to Hungarian, some were found to contain inconsistencies insofar as in some items the Hungarian version of the task fails to feature only minimal pairs.

I discovered one of these violations while checking the words and images against one another in each word group. Question 51 contains pictures representing the Hungarian words "fóka", "róka", csóka, and "boka" (Labas-Weber, n.d., p. 51). *Verbal Auditory Discrimination* is supposed to feature words that differ "from each other by only one initial phoneme" (Fabbro, 2001, p. 202), yet the word "boka" differs from the rest not only in its first consonant but also in the length of the following vowel. This difference might be accounted for by the limited number of consonants that can precede "–óka" in Hungarian, a constraint that could have convinced the test adaptor to use "boka". Placing the consonant "m" in front of "-óka", however, constructs the meaningful word "móka", which renders the above-mentioned excuse

irrelevant. Against the replacement of “boka” for “móka”, the latter meaning “amusement” in English, it might be argued that the task should include words expressing objects for the sake of unambiguous visual representation. However, there are examples for concept words in the English version of the task, too. The word “dead”, among others, is indeed related to a concept rather than an object. Still, its visual representation, a man lying in a coffin, remains unambiguous (Paradis, 1989b, p. 63).

Another source of inconsistency was found when reviewing the group “rák”, “zsák”, “mák”, and “fák” (Labas-Weber, n.d., Hallási Megkülönböztetés Szavakban section, para. 5). Although this set of words (Question 49) seems to conform successfully to the minimal pair rule set by the English “ball”, “shawl”, “fall”, and “mall” (Paradis, 1989a, Verbal Auditory Discrimination section, para. 5), the last item in the Hungarian group stands out as it contains two morphemes instead of one. This again raises the issue of cross-language adaptability. Individual language characteristics, such as the agglutinating nature of Hungarian, need to be considered when adapting the test into another language. This word group proves that these characteristics were indeed adapted in the case of the Hungarian BAT, but only, at least in this example, at the expense of internal consistency. While the lexemes “rák”, “zsák”, and “mák” stimulate the aphasic patient’s ability to distinguish between sounds, the item “fák” imposes on the patient the grammatical burden of construing “fák” as a single noun (“fa”), to which a plural bound morpheme (“k”) is attached, a morpheme combination not encountered before in this task. An aphasic patient might not answer Question 49 correctly either because of their impaired auditory discrimination abilities, or because their command of the rules of grammar is damaged, as is the case with those suffering from Broca’s aphasia (Bánréti, 2011). *Content*

validity, the aim to offer linguistic sample that is meant to be measured, is thus violated. As this inconsistency increases the risk of test invalidity, it has to be addressed and resolved.

Verbal Fluency, the second task concerned with phonetics, is focused more on language production than comprehension, and shows a number of differences throughout the various language versions of the BAT. Because of its focus, this task is especially relevant for Broca's aphasics whose language production areas in the brain are damaged (Bánréti, 2011). The patient in this task is asked to utter as many words beginning with a particular sound as they are capable of producing in a one-minute timeframe. While aphasic speakers of English are asked to find words beginning with the sounds /p/, /f/, and /k/, those of Hungarian are assigned the word-initial phonemes /b/, /k/, and /s/. In order to understand these differences, I first collected data from BAT tests in other languages, grouped by language families. (See Appendix A for data on word-initial phonemes used in the *Verbal Fluency* task in sixteen language versions of the BAT.) The majority of the language versions conform to the English one and feature the sounds /p/, /f/, and /k/, irrespective of language families, with /f/ replaced with /v/ in a few cases. The Hungarian version, on the other hand, includes only one of the four most frequently used phonemes in *Verbal Fluency*.

The data collected prove that the set of sounds allowed in this task is not bound, as it shows variation from language to language. As for how to select the sounds when adapting the BAT to a new language, instructions included in the guidebook The Assessment of Bilingual Aphasia should be followed. Without access to the abovementioned book, but intrigued by the relatively large deviation of the Hungarian task from that in other languages, I further investigated the phonetic properties of the five phonemes used in the English and in the Hungarian versions of the BAT (Nádasdy, 2006). (See Appendix B for the properties of the

phonemes featured in the English and Hungarian versions of the task.) I also consulted studies investigating phonetics in the case of aphasics, in order to find a rationale behind the phoneme selection principle. I expected to find the answer to two questions: why the sound /k/ was retained and why /p/ and /f/ were substituted for /b/ and /s/ in the Hungarian task.

The research papers consulted claim that the phonemic behaviour of aphasics has been "an area of confusion and controversy" (Burns & Canter, 1977, p. 492). As expected, individual differences and the various types of aphasia affect the kinds of speech production errors, as "the Broca's aphasic exhibits primarily a phonetic or articulatory deficit, whereas the Wernicke's aphasic exhibits primarily a phonemic or phonological planning deficit" (Shinn & Blumstein, 1983, p. 90).

I reorganized the data found along the two organizing principles of consonants: the place of articulation and the manner of articulation, with special attention to the voiceless/voiced distinction, "an important sub-criterion of manner" (Nádasdy, 2006, p. 53).

In relation to voicing, the following data were found. According to Shinn and Blumstein (1983), the phonetic categories voiceless and voiced (pairs include /p/-/b/, /k/-/g/, and /t/-/d/) overlap when produced by Broca's aphasics (Shinn & Blumstein, 1983). This means that the voiced-voiceless distinction is avoided with the substitution of voiced for voiceless sounds, such as /b/ for /p/ (Burns & Canter, 1977). Ball, Damico, and Code (2007) also report of a patient who could produce voiced phonemes where voicing had no contrasting role, but replaced voiced sounds with voiceless counterparts where contrast was a possibility. Thus, Broca's aphasics tend to avoid the vibration of the vocal cords, and thus utter voiceless phonemes (Ball, Damico, & Code, 2007). Patients with this type of aphasia also produce more

errors related to voicing than the place of articulation: “14 utterances contained a place error, and 33 utterances a voicing error” (Shinn & Blumstein, 1983, p. 109). It is important to note, however, that Burns and Canter (1977) recorded the opposite order of frequency after working with Wernicke’s aphasics. They found that mistakes in the place of articulation were the most frequent errors, whereas voicing problems occurred the least often (Burns & Canter, 1977, p. 501-502). These contrasting results further highlight the importance of taking the types of aphasia and individual differences into consideration before using the BAT.

As for the place of articulation, it is hypothesized that for Broca’s aphasics, the “correct production of an alveolar consonant may require finer motor control than the more gross movements of the lips or tongue body for the labial and velar consonants respectively” (Shinn & Blumstein, 1983, p. 98). Such alveolar consonants include the phoneme /s/, featured in the Hungarian version of the task.

Blanken, Wallesch, and Papagno (1990) claim in relation to the manner of articulation that “the high proportion of plosives [that is, stops] partly reflects motorically easier sounds to produce” (as cited in Ball, Damico, & Code, 2007, p. 4). The findings about the place and manner of articulation could account for the many phoneme substitutions recorded by researchers insofar as the voiceless alveolar stop /t/ was in many cases substituted for the voiceless velar stop /k/ or the voiceless bilabial stop /p/ by the aphasic patient (Burns & Canter, 1977; Shinn & Blumstein, 1983).

In brief, the following findings were recorded in relation to Broca’s aphasics. First, producing voiceless sounds is easier than uttering voiced ones. Second, the articulation of bilabial, labio-dental, and velar sounds allows for cruder movements than that of alveolar

consonants, and is thus deemed easier to pronounce. Third, stops are found to be more easily produced due to their relatively high prevalence in English.

In view of these facts, it can be argued that the English BAT was constructed in a way that it would assess the production of some less difficult phonemes. /p/, /f/ and /k/ are all voiceless, either labial or velar, and stops with the exception of /f/. The Hungarian version of the task, on the other hand, seems to measure sound production impairment on a larger scale. Apart from the voiceless velar stop /k/, it features the voiced sound /b/, and the alveolar phoneme /s/, which could cause the tested patient to perform the task with less success, while helping maintain a more diverse sample for testing.

Overall, the controversial and evolving nature of the topic necessitates regular revision of the *Verbal Fluency* task, both in the original English and the adapted versions of the BAT.

3.2 Morphology

Two morphology-based tasks test the aphasic patient's ability to produce target words following the comprehension of base words. *Derivational Morphology* in the English BAT includes nouns to be turned into adjectives with the application of the appropriate bound morphemes. The Hungarian version tests the understanding and production of different word classes, as the base words in this version are adjectives out of which the patient is asked to create adverbs.

It can be argued that the adaptation rendered this task more easily approachable in Hungarian since target words remain phonetically and morphologically closer to the base words than in the English version. The ten adjectives are turned into adverbs by attaching the

affix "–an" or its variants to the end of the unbound morpheme, the latter left intact on the surface throughout the task. Word pairs produced include "látható-láthatóan" and "erős-erősen" (Labas-Weber, n.a., Szószerkezet section, para. 4, 11). The English version, on the other hand, triggers phonetic and morphological changes that show more diversity. Some items are closer on the surface to the Hungarian stimuli ("power-powerful"), while others require the changing of the base item ("youth-young", "pride-proud"), as well (Paradis, 1989a, Derivational Morphology section, para. 9, 11).

The relationship between adaptability and language characteristics gains importance with this task because even by keeping to the original rules and using nouns as base words and adjectives as target words, the discrepancy between the levels of difficulty could not be balanced out between the English and the Hungarian versions. Turning "láthatóság" into "látható" instead of "látható" into "láthatóan" would also leave the base word intact and require only the addition or removal of a Hungarian affix. In this case, language differences prevent the task from a successful adaptation, that is, conversion without differing levels of difficulty.

The adaptation of the next morphology-based task, called *Morphological Opposites*, seems to justify the previous claim. This task tests the aphasic patient's command of the privative prefixes. The English version presents items from different word classes, including adjectives and verbs, while the Hungarian version is restricted to adjectives as base words. Individual language characteristics here allow for modification of the base word in the Hungarian version, as exemplified by "páros-páratlan" and "törékeny-törhetetlen" (Paradis, 1989a, Morphological Opposites section, para. 10, 13). The English sample, however, again shows more diverse stimuli owing to language differences. The English target words contain

privative prefixes such as “dis-”, “un-”, “in-”, “im-”, and “il-”, while the same Hungarian affix group comprises the one affix “–talan” (along with its other surface representations).

Overall, the morphology-based tasks present another issue that adaptors have to face while creating a new language version of the BAT. Differences among languages can prevent an adapted task from generating the same stimuli as the original. Deviation from the original test, in this case, is inevitable. The violation of content validity, in this case, is a two-folded issue: looking at the different language versions separately, the Hungarian task measures the use of affixes as successfully as the English one. However, when comparing the two versions, the English one seems to have more *content validity* than the Hungarian one. Thus, when evaluating task results of an English-Hungarian bilingual aphasic patient, the clinician needs to compare data with extra caution, and calculate with the possibility of discrepancy triggered with unavoidable language differences.

3.3 Syntax

Over 60 questions measure the aphasic patient’s understanding of syntactic relations in *Syntactic Comprehension* in the BAT. Upon hearing a sentence, the patient’s task is to touch a picture that describes a situation closest to the meaning of the utterance. This section contains items whose meanings were changed during adaptation in order to conform to the Hungarian rules of grammar.

Changes were triggered, among others, with the English gender-specific pronouns, which have no Hungarian alternatives. Accordingly, while Question 68 in the BAT (“She holds him.”) is an unambiguously illustratable concept, its Hungarian mirror translation (“Ő fogja őt.”) bears no information as to which character in the picture holds who (Paradis, 1989a, Syntactic Comprehension section, para. 7; Labas-Weber, n.d., Mondattani Szerkezetek

Megértése section, para. 7). As a result, this and similar sentences were adjusted by the elimination of the gender-specific pronoun and the introduction of demonstrative pronouns instead ("Ő fogja azt.", meaning "She holds that."). To compensate for the loss of some similar sentences ("She holds him." and "She holds her." are both redundant in the Hungarian BAT), the distinction between "őket" and "azokat" (the first referring to animate, the latter to inanimate concepts, but both translating into "them") was used, with pictures successfully expressing the necessary relationships.

Another grammatical construction that prompted the modification of the task is the Passive Voice, on which the English version of the task heavily relies. The patient's command of the Passive Voice is tested along with their understanding of negation, as well as the Subject-Object relation within a sentence. In the Hungarian BAT, the Passive Voice is avoided altogether, in response to the test creator's suggestion for the adjustment of inappropriate use of language (McGill University, n.d., para. 1). In some cases, the original sentence is not simply turned into the Active Voice, but the Subject and the Object are switched, as well: while the English BAT features the sentence "The car is not pulled by the truck.", the Hungarian version has "A teherautót nem húzza az autó.", meaning "The car is not pulling the truck." (Paradis, 1989a, Repetition of Words and Nonsense Words, and Lexical Decision section, para. 41; Labas-Weber, n.d., Szavak és Értelmetlen Szótagok Utánmondása, és Azok Értelmességének az Eldöntése section, para. 41). It is important to note that the French BAT, which uses the Passive Voice, albeit less often than the English one, offers yet another solution to the adaptation issue. The corresponding sentence conforms more to the original English utterance and remains passivised, but nevertheless changes the Subject-Object relation similarly to the Hungarian adaptation ("Le camion n'est pas tiré par la voiture.", meaning

"The truck is not pulled by the car.") (Golblum & Paradis, 1989a, Répétition de Mots et de Logatomes, et Décision Lexicale section, para. 41).

The syntax-based tasks seem to be adapted to Hungarian with more success and less ambiguity than the phonetics- and morphology-based ones. Although grammatical concepts such as negation or the Subject-Object relation work differently in the two languages, adaptation from one to another seems to cause no inconsistencies. Because it is recommended that the bilingual patient be tested on two languages on two separate days, discrepancy between the meaning of sentences in the English and the Hungarian versions does not seem to be an issue, either.

3.4 Semantics

Semantic Categories and *Semantic Acceptability*, along with *Synonyms* and *Antonyms*, focus on the grouping of words based on similar or dissimilar meanings. Accordingly, only grammatically correct words and sentences are included in this section. The Hungarian adaptation is an almost identical translation of the English one with only minor changes introduced, such as the replacement of "sardine" for "ponty", meaning "carp". In terms of semantics, cultural appropriateness is the key issue to consider during adaptation rather than language characteristics. Expressions denoting concepts that are alien to cultures (potential examples include "tulip", "blackbird", or "ashtray") might need adjustment in some language versions of the BAT (Paradis, 1989a, Semantic Categories section, para. 4, 8; Synonyms section, para. 5). As for the Hungarian version, however, no such corrections were needed.

3.5 Summary

The comparison of the English and Hungarian versions of the BAT supports the idea that there are complex linguistic, cultural, and individual differences across language versions that need to be taken into consideration when adapting the test to new languages.

Despite the correct adaptation of some tasks in the Hungarian BAT, certain problems pertain and need revision. Apart from many spelling mistakes and occasional punctuation errors that could negatively affect the testing process, there are inconsistencies mainly in those tasks that explicitly target one specific level of language. Among these, some items were adapted with a disregard for other levels of language (for instance, the example of "fák", a phonetically correct but morphologically incorrect inclusion in the *Verbal Auditory Discrimination* task). Moreover, issues could emerge in those tasks, as well, which measure more than one level of language at the same time. If Part B is used in both languages to test an English-Hungarian bilingual aphasic, the phonetic and morphological errors made during the adaptation could further distort results. While these parts of the Hungarian BAT are critical and need correction, the inconsistencies revealed in this paper could be beneficial to clinicians who decide to adapt the BAT to new languages.

3.6 Criticism

To offer criticism of the BAT is itself a complex issue owing to the high number of variables involved in the different versions of the test and the individual differences in relation to the testing process, as observed during an overview of the cross-language adaptability of the test. A reasonable approach may be to discuss validity and time efficiency concerns, two common issues raised by test conductors, along with their suggestions for future amendments to the BAT.

3.6.1 Validity concerns and suggestions for future amendments. There is a peculiar lack of data available on the validity of the BAT on the official website of the test (McGill University, n.d.). The doctoral thesis by Ruiz (2008), the only document referenced on the official website that is concerned with validity, is written in Spanish with a focus on the Catalan and Castilian versions of the test (Ruiz, 2008). The scarcity of more documents targeting validity in the Spanish BAT definitely necessitates further research. An even more alarming problem is the complete lack of referenced studies looking into the validity of the BAT in other languages, primarily in English (McGill University, n.d.). The issue of unavailable information on test validity was raised by Hughes, who warned against using tests that lack these data (Hughes, 1989). In order for the test to become a more stable point of reference in the future, it is vital that validity measurements be performed and made available first and foremost in English, the first official language of the BAT, and other languages, too. Only then can BAT-related infelicities and errors be targeted effectively with necessary amendments put forward, a set of goals pursued by the test creator on the official website (McGill University, n.d.).

Despite the lack of referenced studies, there are data available on the validity of the BAT because test conductors have worded criticism relating to this issue. Ivanova and Hallowell (2009), for example, claim to have identified problems with "internal consistency and validity" of several items of the Russian BAT (Ivanova & Hallowell, 2009, p. 544). They also found the test to be in need of revision owing to, for example, "low discrimanibility and consistency of some of the items" and "unbalanced difficulty within or across subtests" (Ivanova & Hallowell, 2009, p. 554). For instance, they found in one question item that "the picture of a storm that is supposed to correspond to the target word ‘‘rolling motion’’ is too

visually complex and it is difficult to interpret what is happening in the picture" (Ivanova & Hallowell, 2009, p. 548). Kiran and Roberts (2009) further pointed out in terms of the test's validity that until the different language versions of the test are validated in relation to one another, "to make any meaningful interpretations of scores on these tests" will continue to face limitations (Kiran & Roberts, 2009, p. 27).

3.6.2 Time efficiency concerns and suggestions for future amendments. In terms of time efficiency of the BAT, one major drawback of the test is the testing time that drastically increases as more languages become involved in the process. Fabbro (2001) hypothesises that the number of sessions spent on rehabilitation a week would be doubled with a second language included, and tripled with a third one (Fabbro, 2001). Reducing the time spent on testing, however, is especially important in terms of assessing and rehabilitating bilingual aphasia, with the extent of recovery achievable varying with different post-onset phases. Thus, the issue of delays because of time spent on testing and the initiation of other testing methods measuring different skills for different types of aphasia, such as the Boston Naming Test (Bialystok, 2009), should be targeted.

The question of time efficiency has been addressed by Paradis (1989) in that he redrafted the BAT and issued a shorter version of it with the removal of a number of question items. As explained on the official website, "when time is limited, the short version may be used" (McGill University, n.d.). Because several researchers commented in their papers on the lack of time for testing, the initiation of the short BAT may seem justified. Ivanova and Hallowell (2009), for example, claim to have omitted tasks on "spontaneous speech, copying, and dictation" for the sake of faster administration of the test (Ivanova & Hallowell, 2009, p. 547). Gaining time at the expense of excluding tasks that measure crucial language skills,

however, proves that while the short BAT may temporarily have focus shift from time considerations, the issue of time efficiency remains relevant in the long run and requires a permanent solution.

3.7 Future directions

The BAT is likely to improve as suggestions for future amendments are welcome and their incorporation in the test is considered by the test creator (McGill University, n.d.). As the BAT has widespread availability ("the BAT is currently available in 65 languages (part B) and 160 language pairs (part C)" and counting (Fabbro, 2001, p. 202)), there are a number of studies conducted with the inclusion of the test, which increases the number of suggestions for future amendments to the test. Muñoza and Marquardt (2008), for example, comment on the need for assessment of language skills from before the onset of aphasia: "interpretation of BAT results for bilingual speakers with aphasia requires accounting for pre-morbid differences in language skill", with pre-morbid standing for "before onset" (Muñoza & Marquardt, 2008 [Abstract]).

Apart from improvements, the resilience of the BAT is also justified, as the test allows for modifications that clinicians have successfully introduced to accommodate the test to their specific needs, with cross-language adaptations being only one example to support this idea. In several cases, alterations for non-linguistic reasons are initiated in relation to the BAT. Schneider and Hopp (2011), for example, combined a modified BAT with tDCS (a form of neurostimulation) to adjust language acquisition in "minimally verbal children with autism" (Schneider & Hopp, 2011 [Abstract]). The BAT was used "to test only basic canonical subject-verb-object sentences" (Schneider & Hopp, 2011 [Abstract]). The clinicians conclude their study by encouraging the further administration of modified BAT tests to bilingual

children suffering from autism (Schneider & Hopp, 2011). Apart from autism, the BAT has been used in the assessment of a set of conditions, including Alzheimer's, multiple sclerosis, Parkinson's, and vascular dementia, too (Paradis, 2011).

It is also worth noting that the official BAT application is now available for smart phones, a move that proves the regular updating of the test and contributes to the seamless, global, and cheap access to it.

Overall, the improvement of the Bilingual Aphasia Test is possible and expected in the future, as feedback is generated by the test conductors, and is taken into consideration by the test creator. Suggestions have been provided in terms of the test's different language versions, along with its modified ones, and with the frequent checking of the test's validity, improvement is attainable.

4. Conclusion

4.1 Summary

My thesis paper explored the structure and cross-language adaptability of the Bilingual Aphasia Test. Test-related concepts, such as bilingualism, aphasia, and test validity, were first explained. This was followed by the investigation of the Hungarian adaptation of the English test from the point of view of language units. Issues with the phonetic and morphological adaptation were found, and suggestions for future amendments were included. Following an overview of researchers' criticism towards the BAT, and the test constructors' readiness to improve the test, I concluded that the Bilingual Aphasia Test had the potential to measure bilingual aphasia with more success, provided that test validity measurements and amendments to the test were introduced in the future.

4.2 Limitations of the research

It is important to note that my research focuses on those tasks of the English and Hungarian Part B of the BAT that explicitly measure only one unit of language, for example, phonetics, at a time. In the majority of the tasks, however, language units overlap. Consequently, further investigation is needed in the assessment of cross-language adaptability of the English and Hungarian versions of the test.

Furthermore, I had no access to the guidebook The Assessment of Bilingual Aphasia (Paradis & Libben, 1987) during the time of writing the present paper. Evaluating the official guidelines provided in terms of, for example, the *Verbal Fluency* task, might have offered an objective point of view to complement my investigation of the way the phonemes in that task were selected.

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Appendix A

Word-Initial Phonemes in the Verbal Fluency Task of Sixteen Language Versions of the Bilingual Aphasia Test

Language Family	Language	Phonemes featured in the Verbal Fluency task										
		/p/	/f/	/k/	/v/	/s/	/l/	/d/	/m/	/b/	/t/	/r/
Uralic	Hungarian			Yes		Yes				Yes		
	Finnish			Yes	Yes							
	Estonian	no data available										
Germanic	English	Yes	Yes	Yes								
	German	Yes	Yes	Yes								
	Dutch	Yes		Yes	Yes							
	Danish	Yes	Yes	Yes								
	Swedish	Yes		Yes		Yes						
Italic	European Portuguese	Yes	Yes					Yes				
	European Spanish	Yes	Yes	Yes								
	French	Yes	Yes				Yes					
	Italian	Yes							Yes		Yes	
	Romanian	Yes	Yes				Yes					
Slavic	Polish	Yes				Yes						Yes
	Czech	Yes			Yes			Yes				
	Russian	Yes	Yes	Yes								
	Ukrainian	Yes		Yes	Yes							

Appendix B

Properties of Phonemes Featured in the English and the Hungarian Versions of the Verbal Fluency Task of the Bilingual Aphasia Test

Test version	Phoneme used in the test	Voiceless/voiced distinction	Place of articulation	Manner of articulation
English	/p/	voiceless	bilabial	stop
	/f/	voiceless	labio-dental	fricative
	/k/	voiceless	velar	stop
Hungarian	/b/	voiced	bilabial	stop
	/s/	voiceless	alveolar	fricative