Validation of the Moroccan Arabic version of the Token Test

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Abstract

The aim of this study was to translate and cross-culturally adapt the Token Test. 54 participants were recruited to evaluate the validity ratio (CVR) of the Token Test. A one-way between subjects ANOVA was conducted to compare MATT scores of 25 non-brain-damaged individuals, 18 individuals with aphasia and 11 individuals with epilepsy. The one-way showed a significant difference at the $p<0.01$ level for the three groups [$F_{(2, 51)} = 72.31$, $p < 0.01$]. Auditory comprehension raw score was significantly correlated with the token test score ($r_{(18)} = 0.836$, $p<0.01$). The aphasic group had higher variance in terms of Token Test scores. The results support the appropriateness of using MATT to assess language skills in Moroccan Arabic-speaking subjects with cognitive deficiencies.

Keywords: adaptation, Token Test, cognitive deficiencies, Moroccan Arabic, aphasia

Introduction

Aphasia is an acquired language disorder that results from damage to areas of the brain that produce and process language. Aphasia can be assessed using a series of screening tools, including the Token Test (De Renzi & Vignolo, 1962), a widely used tool. The Token Test is made up of tokens that come in two shapes (rectangle and circular), two sizes (large and small), and five colors. The Token Test has been translated to 40 different languages (Bastiaanse et al., 2016). Despite this, a valid assessment tool is not available in Moroccan Arabic.

Methods and procedures

Study population

54 right-handed individuals participated in this study. The group consisted of 25 healthy adults ranging in age from 27 to 76 with a mean of 51.60 (SD=14.13). Ages for 18 patients with brain damaged in the left hemisphere ranged from 41 to 80 with a mean of 61 (SD=12.28). The mean of 11 Epileptic patients was 42.36 (SD=11.36) with a range of 25-62. The time elapsed since onset of aphasia ranged from 1 week to 3 years. The stroke and epileptic subjects were referred to the university hospital M6 (CHU M6) and other clinics in Marrakech for rehabilitation. The epileptic patients were identified as

non-aphasic by the Moroccan version of the Montreal–Toulouse Protocol of Aphasia Linguistic Examination (TM86) (El Alaoui Faris et al., n.d), while the aphasic patients had experienced stroke and were identified aphasics by the same assessment.

Adaptation and procedure

The purpose of translating a test is to create a version that is conceptually equivalent to the original. This can be accomplished by following the international gold standard translation (Efstathiou, 2019) and the translation techniques recommended by the MAPI Research (Acquadro et al., 2012). Translation steps that comply with these guidelines were forward translation from English to Moroccan Arabic, a review of forward translation, backward translation into English, a review of the backward translation, pretesting the translated version of the test, followed by final testing.

Statistical analysis

To compare MATT scores of the three groups: post-stroke aphasic group, Epileptic group, and non-brain-damaged group, a one-way between subjects ANOVA was conducted. A bivariate correlation was conducted to investigate how the MATT scores relate to the raw auditory comprehension score of the Moroccan version of the Montreal–Toulouse Protocol of Aphasia Linguistic Examination (TM86).

Results

Regarding Shapiro-Wilk's test ($p > 0.05$), skewness and kurtosis values, our data are a little skewed and kurtotic, but they do not differ significantly from normality. We can assume that our data are normally distributed. A one-way between subjects ANOVA was conducted to compare Token Test scores of the three groups: post stroke aphasic group, Epileptic group, and healthy group. There was a significant difference at the $p < 0.01$ level for the three groups [$F_{(2, 52)} = 72.31$, $p = .00$]. Post hoc comparisons using the Tukey HSD test showed that the scores of the healthy group (M=32.60, SD=2.82) was significantly higher than both the Epileptic group (M=30.86, SD= 2.32) and post-stroke aphasic group (M=17.47, SD=6.25). Table 1 summarizes the comparison of mean scores for all the participants on the MATT and the auditory comprehension test. The Epileptic group scored significantly higher than the post-stroke aphasic group (p=.00).

As table 2 illustrates, a bivariate correlation was conducted to see how the MATT scores relate to the raw auditory comprehension score of the Moroccan version of the Montreal–Toulouse Protocol of Aphasia Linguistic Examination (TM86), which is a sentence/word-picture matching task. Participants had to point to the correct action or picture that matches the word or sentence. Auditory comprehension raw score was significantly correlated with the token test score ($r_{(18)} = 0.836$, p=.00). Compared to the two non-aphasic groups, the

aphasic group had higher variance in terms of Token Test scores, which suggests that aphasic severity can be measured through this task.

Table 1. Performance on part 1 to 6 of the MATT and Auditory Comprehension.

Group		Part1	Part2	Part3	Part4	Part5	Part6	Total	AC
H	M	7.00	4.00	3.96	3.74	3.62	10.28	32.60	12.36
	SD	.00	.00	.13	.32	.415	2.28	2.82	.99
E	M	7.00	4.00	3.90	3.86	3.50	8.59	30.86	11.72
	SD	.00	.00	.30	.23	.31	2.17	2.32	1.67
A	M	6.52	3.05	2.69	2.08	1.61	1.50	17.47	7.72
	SD	.65	.98	1.15	1.16	1.19	2.07	6.25	2.49

H=Non-brain damage, E=Epileptic, A=Aphasic, A.C= Auditory Comprehension, M= Mean, SD= Standard Deviation

Table 2. Correlations of MATT and the Auditory Comprehension.

		MATT	A.C
Healthy	MATT	1	.772**
	Auditory Comprehension	.772**	1
Epileptic	MATT	1	.681*
	Auditory Comprehension	.681*	1
Aphasics	MATT	1	.836**
	Auditory Comprehension	.836**	1

** $p<0.01$,   *$p<0.05$

Discussion

This study evaluated the efficiency of available screening tools to accurately identify potential language problems in Moroccan aphasic patients. This investigation revealed subtle receptive language processing that potentially contributes to the language performance frequently reported among Moroccan-speaking aphasic patients.

   The Token Test performance of the three groups were significantly different from one another. The healthy group scored higher than the other groups. The epileptic patients scored slightly lower, and the aphasic stroke patients performed the poorest of the three groups. The MATT was significantly correlated with the auditory comprehension score of the Moroccan version of the Montreal–Toulouse Protocol of Aphasia Linguistic Examination (TM86).

Conclusion

The findings of the current study indicate that the MATT is a valid measure for the assessment and diagnosis of aphasic symptoms in Morocco, in particular, distinguishing aphasic to non-aphasic subjects, and providing information regarding aphasic severity.

Acknowledgements

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