COMPARISON OF WAB SCORES IN TELUGU MONOLINGUALS AND TELUGU-ENGLISH BILINGUAL SPEAKERS

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Abstract

Aphasia is a breakdown in the two-way translation processes that establishes the relation between thought and language. As a consequence, people with aphasia have an inability to translate, with reasonable fidelity. The Western Aphasia Battery (WAB, Kertesz, 1979 has become a popular protocol for the clinical evaluation of aphasia. The present study aimed to compare WAB scores across Normal Monolinguals (Telugu) and Bilingual (Telugu-English) Speakers across different age groups. The study was carried out among 120 typical adult Telugu speaking individuals in the age range of 20-70 years who were considered for control group. These 120 participants were categorized into five age groups like 20-30, 31-40, 41-50, 51-60 and 61-70 years with 24Participants in each group. Each group consists of 12 monolinguals (6males and 6 females) and 12 bilinguals (6 males and 6 females). All the Participants in the study have Telugu as their native language, and with no history of any neurological or psychiatric illness, alcoholism or drug abuse. All the participants were matched for their age, gender, language level, handedness, socio-economic status and educational level. Results revealed that bilingual participants performed better than monolingual participants in all the tasks in different age groups and also across both the genders. In the present study overall performance of bilingual participants was better than monolingual participants. Bilinguals are able to mastery over two different sets of skills or strategies than monolinguals and also all the bilingual participants in the study are from higher educational qualification and socio-economic status.

Key words: *Aphasia, Monolinguals, Bilinguals*

Introduction

Aphasia is a language disorder which is defined as an acquired impairment of language processes underlying receptive and expressive modalities and caused by damage to areas of the brain which are primarily responsible for language function (Davis, 1983). Aphasia is generally caused by diffuse or focal injury to brain, and thus impairs a person's ability to understand, produce and use language. Western Aphasia Battery (Kertesz, 1979) is considered as one of the important assessment tool which is most frequently used in clinics for the assessment of individuals with aphasia and allied disorders. Such a test would help in identifying the aphasic, describing the aphasia and classifying it into various subgroups for the purpose of diagnosis, therapy and prognosis. Bilingualism in India is ubiquitous and normative, meaning most people, especially literate urban adults, in India are multilingual. Considering the majority of the population in an Indian context, there arises a need to pay attention to the 'bilingual phenomenon' in clinical settings as well. It is thought to be an adaptive strategy of the minor and minority linguistic community for the maintenance of the mother tongue. The typical language use pattern is likely to be; use of L1 in the intimate domain, L1, L2 (both Indian languages) or even L3 (English) in the informal domain and mostly English in the formal domain. Albert and Obler (1978) in their study report that perceptual strategies of bilinguals differ from those of monolinguals. The bilinguals seem to have mastery over two different sets of skills or strategies which monolinguals use for each language. They reported that bilinguals mature earlier than monolinguals both in terms of cerebral lateralization for language and in acquisition skills for linguistic abstraction. They also reported that bilinguals have better developed auditory language skills than monolinguals but there is no clear evidence that they differ from monolinguals in written language skills.

According to Grosjean (1994) the term "bilingual" refers to all people who use two or more languages or dialects in their everyday lives. Rajasudhakar (2005) studied the effects of age, gender & bilingualism on cognitive-linguistic performance. Two group of participants participated in the study. Group one and eleven consisted of forty young and old individuals respectively. Each group had twenty monolinguals & twenty bilinguals. Equal number males & females participated in each group. The results revealed that younger individuals were better on cognitive linguistic tasks than elderly individuals. Bilinguals were better on all the domains of CLAP, compared to monolinguals. Gender difference was not observed in any of the tasks. The study highlights the age and language-related performance differences on cognitive linguistic skills. The aim of the present study was

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to compare WAB scores across Normal Monolinguals (Telugu) and Bilingual (Telugu-English) Speakers across different age groups.

Method

The aim of the present study was to compare Western Aphasia Battery (Kertesz, 1979) scoresacrosstypical NormalMonolinguals (Telugu) and Bilingual (Telugu-English) Speakers. The Western Aphasia Battery (WAB; Kertesz, 1982) has become a popular protocol for the clinical evaluation of aphasia. Among its advantages are the simplicity of the test, yet quantifiable scoring system and a relatively short administration time (approximately 1 hour), although for few aphasics it may take two sessions often required to complete the full battery. The Western Aphasia Battery (WAB; Kertesz, 1982) was designed to evaluate the main clinical aspects of the oral language functions: spontaneous speech, auditory verbal comprehension, repetition and naming, as well as reading, writing and calculation. Nonverbal skills are also tested, such as drawing, block design and praxis and Raven's Progressive Matrices. In the present study Western Aphasia Battery in Telugu (WAB-T) developed by Sri Pallavi &Chengappa, (2010) was administered for both monolingual and bilingual participants. For Sentence completion task in naming question numbers 5 is modified and in responsive naming question number 2 and 4 aremodified. In reading task question number 3 is modified. All the Words in writing of dictated or visually presented words in writing task were modified except for the word nose. All other tasks were same as that of Western Aphasia Battery (WAB; Kertesz, 1982) and modifications were done according to the frequent occurrence of words and linguistic principles of Telugu.

Table 1: Age range of normal monolinguals and bilinguals groups

Sl. No	Age Groups (Years)	Participants	ML Male	BL Male	ML Female	BL Female
1	20-30	24	6	6	6	6
2	31-40	24	6	6	6	6
3	41-50	24	6	6	6	6
4	51-60	24	6	6	6	6
5	61-70	24	6	6	6	6

*ML- Monolingual, BL- Bilingual.

120 typical normal adult Telugu speaking individuals in the age range of 20-70 years were considered for control group. These 120participants were categorized into five age groups like 20-30, 31-40, 41-50, 51-60 and 61-70 years with 24Participants subjects in each group.

Each group consists of 12 monolinguals (6males and 6 females) and 12 bilinguals (6 males and 6 females). All Participantsin the study have Telugu as their native languageand with no history of any neurological or psychiatric illness or of alcoholism or drug abuse. All the subjects were matched for their age, sex, language level, handedness, socio-economic status and educational level.

Monolinguals in the present study were selected with Telugu as theirnative language with no educational background.NIMH Socio economic status scale revised versiondeveloped and Standardized by Venkatesan (2011) was used in the study which includes aspects like pooled monthly income, Highest education, Occupation, Family properties was also administered for 60 monolingual participants to categorize them into different levels of socio-economic status.

Table 2: Scores of Monolingual Participants

SES	SES I
0-4	5-8

Monolingual Participants obtained a score in the range of SES (0-4), SES I (5-8)

Bilingual participants in the present study were selected with Telugu as their native language and English as their second language.International Second Language Proficiency Rating Scale (ISLPR) was administered to 60 bilingual (T-E)speakers in order to find the second language proficiency. International Second Language Proficiency Rating Scale (ISLPR) includesspeaking, listening, readingand writing tasks.

Table 3: Scores of Bilingual Participants

Speaking	Listening	Reading	Writing
4+-5	4+-5	4-5	4+-5

Table 3 shows scores obtained by the bilingual participants in all the tasks. This shows good second language proficiency in bilingual speakers.

NIMH Socio economic status scale revised versiondeveloped and Standardized by Venkatesan (2011) was used in the study which includes aspects like pooled monthly income, Highest education, Occupation, Family properties was administered to all bilingual participants.

Table 4: Scores of Bilingual Participants

SES II	SES III	SES IV
9-12	13-16	17-20

Bilingual Participants obtained a score in the range of SES II (9-12), SES III (13-16), and SES IV (17-20).

Western Aphasia Battery in Telugu (WAB-T) developed by Sri Pallavi & Chengappa, (2010) was administered for both monolingual and bilingual participants and Aphasia Quotient and Cortical Quotients were calculated.

Results and Discussion

Western aphasia battery (WAB) scores obtained have been compared across Normal Monolinguals (Telugu) and Bilingual (Telugu-English) Speakers and mean values were also calculated across different age groups.

Table 5: Mean values of Monolinguals and Bilinguals in different tasks

Parameters	Monolinguals	Bilinguals	Parameters	Monolinguals	Bilinguals
SS	19.4	20	AQ	96.4	99.22
Y/N	59.6	59.85	Reading	77.6	96.3
AWR	59.3	60	Writing	55,6	94
SC	77.8	80	Apraxia	60	60
Repetition	97.1	99.1	Drawing	21.4	27.9
ON	60	60	Calculations	7	8.6
WF	14.2	17.9	BD	10.1	8.76
SC	8.63	9.36	RCPM	22.5	19.1
RN	9.26	9.7	CQ	72.6	77.2

SS-Spontaneous speech, Y/N-Yes/no questions, AWR-Auditory word recognition, SC-Sequential commands, ON-Object naming, WF-Word fluency, SC-Sentence completion, RN-Responsive naming, AQ-Aphasic quotient, BD-Block design, RCPM-Ravens colored progressive matrix, CQ-Cortical quotient.

Tables 5 depict the mean values obtained for Bilingual Participants are better compared to that of monolingual participants. Mean values for both aphasic and cortical quotients obtained for bilingual participants were comparatively better than that of monolingual participants.

Table 6: Mean scores of normal Monolingual male participants in Western aphasia battery (WAB) across the gender in different age groups

Age groups	20-30	31-40	41-50	51-60	61-70
SS	19.3	19.1	19.1	19.6	19.5
Y/N	60	59	60	60	58.5
AWR	60	60	60	58.5	59
SC	80	80	80	76.6	73.3
Repetition	98.3	96.8	97	95.3	97.6
ON	60	60	60	60	60
WF	16.5	17.3	14.3	13.5	15.8
SC	8.3	8.33	8.6	9	9.3
RN	9	10	10	9	8.3
AQ	97.1	96.7	96.3	96.7	96.1
Reading	85	89.3	76	85.3	84
Writing	74.3	69.1	59.6	88	65
Apraxia	60	60	60	60	60
Drawing	23.5	25	23.8	24.6	22.8
Calculation	12	12.5	13.5	12.6	12.3
BD	7	8	7	7.5	7.3
RCPM	24.8	25.8	23.1	21.1	20.8

*SS-Spontaneousspeech,Y/N-Yes/noquestions,AWR-Auditorywordrecognition,SC-Sequential commands, ON-Object naming, WF-Word fluency, SC-Sentence completion, RN-Responsive naming, AQ-Aphasic quotient, BD-Block design, RCPM-Ravens colored progressive matrix, CQ-Cortical quotient.

Table 7: Mean scores of normal Monolingual female participants in Western aphasia battery (WAB) across the gender in different age groups.

Age groups	20-30	31-40	41-50	51-60	61-70
SS	19.5	19.1	19.3	19.6	19.6
Y/N	60	60	60	60	58.5
AWR	60	60	59.5	57.1	59
SC	77.6	80	80	75	75.8
Repetition	98.5	97.5	98	95.1	96.8
ON	60	60	60	60	60
WF	13	14	14	10.5	12.6
SC	8.6	9.3	8.6	7.6	8.33
RN	9.6	10	10	8.3	8.3
AQ	96.7	96.5	96.9	95.1	95.9
Reading	72	89.6	85.3	14	86
Writing	57.2	58.7	50.6	15	18.3
Apraxia	60	60	60	60	60
Drawing	22.4	23.8	21.3	9.3	17.3
Calculation	10.8	12.8	6.1	5.5	2.8
BD	7.5	9	6	4.5	6.1
RCPM	28.6	22.6	24.8	16	17.5
CQ	73.1	74	73.1	64.7	70

*SS-Spontaneous speech, Y/N-Yes/no questions, AWR-Auditory word recognition, SC-Sequential commands, ON-Object naming, WF-Word fluency, SC-Sentence completion, RN-Responsive naming, AQ-Aphasic quotient, BD-Block design, RCPM-Ravens colored progressive matrix, CQ-Cortical quotient.

Table 8: Mean scores of normal Bilingual male participants in Western aphasia battery (WAB) across the gender in different age groups

Age groups	20-30	31-40	41-50	51-60	61-70
SS	20	20	20	20	20
Y/N	60	60	60	60	60
AWR	60	60	60	60	60
SC	80	80	80	80	80
Repetition	98.5	98.8	99.6	99	99
ON	60	60	60	60	60
WF	18.3	17.6	18.3	17.3	17
SC	8.6	8.66	10	9.6	9.3
RN	10	9.6	10	9.6	9.3
AQ	99.1	99	99.6	99.2	98.9
Reading	100	94.6	97.3	94.6	94.6
Writing	98.3	95	92.5	95.8	91.6
Apraxia	60	60	60	60	60
Drawing	28	28.6	29	27.6	26.3
Calculation	16	16.6	21.3	20	18.5
BD	9	9	9	8	8.6
RCPM	28.5	28.6	31	28	28.8
CQ	78.5	78.1	78.8	78.3	77.9

*SS-Spontaneousspeech,Y/N-Yes/noquestions,AWR-Auditorywordrecognition,SC-Sequential commands, ON-Object naming, WF-Word fluency, SC-Sentence completion, RN-Responsive naming, AQ-Aphasic quotient, BD-Block design, RCPM-Ravens colored progressive matrix, CQ-Cortical quotient.

Table 9: Mean scores of normal Bilingual female participants in Western aphasia battery (WAB) across the gender in different age groups

Age groups	20-30	31-40	41-50	51-60	61-70
SS	20	20	20	20	20
Y/N	60	60	60	58.5	60
AWR	60	60	60	60	60
SC	80	80	80	80	80
Repetition	100	98.1	99.3	99	100
ON	60	60	60	60	60
WF	18.3	18	19	17.6	17.6
SC	9.6	9.3	9.6	9.3	9.3
RN	10	9.3	10	9.6	9.3
AQ	99.6	98.9	99.6	98.9	99.2
Reading	100	97.3	94.6	95.3	94.6
Writing	93.6	91.5	93.1	94.1	94.1
Apraxia	60	60	60	60	60
Drawing	28.6	24.6	28.8	29.1	28.6
Calculation	18.8	18.1	20.3	21.3	19.5
BD	9	9	9	8.5	8.5
RCPM	33.6	32.6	30.1	25.1	28.1
CQ	78.9	78.1	78.6	66.4	78.3

*SS-Spontaneousspeech,Y/N-Yes/noquestions, AWR-Auditorywordrecognition, SC-Sequential commands, ON-Object naming, WF-Word fluency, SC-Sentence completion, RN-Responsive naming, AQ-Aphasic quotient, BD-Block design, RCPM-Ravens colored progressive matrix, CQ-Cortical quotient.

Results revealed that bilinguals performed better than monolinguals across all the tasks in different age groups. Across the gender bilinguals performed better than monolinguals in all the age groups which shows that the bilinguals seem to have mastery over two different sets of skills or strategies which monolinguals use for each language. Maturity level for bilinguals is earlier than monolinguals both in terms of cerebral lateralization of language and linguistic acquisition skills. Education and socioeconomic status also plays a very important role. Monolinguals with low socioeconomic status with limited educational status performed poorer compared to that of bilinguals with higher socioeconomic status with good education compared to that of monolinguals. studied on the normative data on the Korean version of the Western Aphasia Battery K-WAB was administered to 224 normal adults in seven age groups (15-24, 25-34, 35-44, 45-54. 55-64, 65-74, and 75 years or older), in five educational levels (0, 1-6, 7-9, 10-12, and 13 years or more) and by gender to obtain the normative data by Kim & Duk (2004). The age and educational levels were influential to the K-WAB performance. Accordingly, they formed six subgroups of the normal: two groups (15-74, and 75 years or older groups) by three educational groups (0, 1-6. and 7 years or more).The highest aphasia quotient (AQ), language quotient (LQ), and cortical quotient (CQ) were achieved by 15-74 age groups with 7 or more years of education thus adults with good education got good scores which is in support to present study. According to Baker (1993) bilingual individuals by knowing two or more words for one object or idea may possess an added cognitive flexibility. Chengappa (2008) reported that cognitive expansion and flexibility in individuals exposed to two or more languages. In the present study bilinguals performed better than monolinguals in different task in western aphasia battery (WAB) due to added cognitive flexibility which is in support with the present study.

Conclusion

In the present study an attempt has been made to compare Western aphasia battery (WAB-T) developed by Sri Pallavi & Chengappa, (2010) was administered to both monolingual and bilingual participants to compare the performance of monolingual and bilingual participants across different age groups and gender. Bilinguals across different age groups and gender performed comparatively better than that of monolingual participants in all the tasks. Bilinguals with higher educational qualification and socioeconomic status obtained better scores than that of

monolinguals with no education and poor socio-economic status for all the tasks.

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APPENDIX – 1

WESTERN APHASIA BATTERY

TEST BOOKLET

(Telugu Version)

ALL INDIA INSTITUTE OF SPEECH AND HEARING

Manasagangotri, Mysore -570006

C. Sentence Completion
Ask patient to complete what you say .Provide an example, such as "ice is (cold)". Score 2 p
correct response and 1 point for phonemic paraphasias. Accept reasonable alternatives,
e.g.; sugar is … (flattening) but not grass is… . (brown)

1. గడ్డి ఏ రంగులో—— ఉంటుంది ? (ఆకుపచ్చ)

2. దక్షిర/మందార ఎలా————ఉంటుంది? (తీయగా/తియ్యని)

3. గులాబి పువ్వు ఎర్రగా ఉంటుంది,మల్లి పువ్వు ———ఉంటుంది? (తెలుపు)

4. వాళ్ళ నన్న ——— లా కొట్టడుతున్నాడు ? (సీట్)

5. భారత స్వాతంత్ర దినోత్సవం———నెలలో జరుపుకుంటారు (ఆగస్ట్)

Maximum Score 10
Patient's Score——

D .Responsive Naming
Score 2 points for acceptable responses , 1 point for phonemic paraphasias

1.　　మీరు దేనిలో రాస్తారు? (పెన్, పెన్సిల్)

2.　　పాలు ఏ రంగులో ఉంటాయి? (తెలుపు)

3.　　సంవత్సరంలో ఎన్ని నెలలు ఉంటాయి?(పది)

4.　　వార్తలు ఎక్కడ వస్తాయి? (న్యూస్ పేపర్)

5.　　మీరు వ్రాయటానికి ఎక్కడ కూర్చుంటారు? (స్కూల్, స్టడీ టేబుల్)

Maximum Score 10
Patient's Score------

V. Reading

A .Reading comprehension of Sentences
Present test sentences, one per card .Instruct the patient to: "Read these sentences and point to the missing word. Choose the best from those." The oral instructions should be accompanied by gesture and by pointing to the words missing and the choice of answers. The instructions may be repeated if the patient does not seem to understand. Ask the patient to do the examples. If the patient does not do it correctly, point to the correct answer and say: "See, this is the missing word, e.g. the tree has...." (Wheels, leaves, grass, or fire)

	Score
1.చేప ------- గా ఉంటుంది నీరు గడ్డి చేప సముద్రం	2
2.ప్రజలు ------------- ని ఆరాధిస్తారు సూర్య కాంతులు సెలవ్ పడవలు	2
3.మనం కార్లు ట్రక్కులు నడిపే నేల్పడు అదను బట్ట --------- ట్రాఫిక్ మందిరం మైదానం ఇంద్ర	4
	11

4. జాన్ పది తర్వాత ఉపాధ్యాయులు ఇదుఆ ప్రసటిప్పరుచారు క—— పాఆు చెప్పరు   4
వర్షాఖ
బిఆఅ
అనవరి
ఫిష్పాఖ

5. ఆఆఆు రెండఆు సాధారణ వనిముఖ్బు వాటివి——————తో చెప్పరు.   6
ప్రైఅు
అఆవి
రోహాం
కొయ్యఆం

6. రైఆుఆు తరచుగా ధాఖ్యం గోధుమఆు మఆిఖు ఇఆర ధాఖ్యఆు పండిస్పరు. వారు ఇఆా——పండించగలుగుతారు.   6
బోగ్గు
ఆ్యాస్టర్సు
ధాఖి
కూరగాఖఆు

7. ఇఆ్త దాఖివంతా అంఆుఆాఆుబో ఇంఆి.ఇఖుఆి ఆగ్గిహోఆఆం పంఆ,ఆాఆ దేశం——ఎఆఆి ఇఆర ప్రఆ్యామ్నాఖ
వనరుఆప్పి ఆధారపడుఆుంఆ్యాఖు.   8
నీఆివి మఆిగించఆం
బ్యాంకుఆు
మార్గఆఆ్షి
ఆఖ్షఖఆఆ్ష

8. ట్రిటానిక్ ఒక అఆ్యఆఆఖైఆ సముద్ర వోక ఆఆి ముఆగఆం అసంభఆం అఆుకుఖ్వారంటా కాని ఆఆి 1912 లో ఒక
మంచు ఇఅఆాప్పి ఢీకొని ముఆిగిహోఖింఆి, ఇఆఆఖిఆు పెఆ్ఆుమంఆిఆి ప్రైగా చఆిహోఖారు. —— ఆఆిగి
ఉఆఆఆహోఆే ఆఆి ముఆిగి ఉంఆేఆి కాఆు.   8
దావి ఇఆ్త కోఆ్చెఆఆం
బాగా పాఆిహోఆఆం
ప్రఖీఅఆఆ్షను ఆీసుఆఆఆఆ్చఆం
నఆఆుఆ నైఫు వఆ్చఆం

Maximum Score 40
Patient's Score -----

D. Writing of Dictated or Visually Presented Words.

Ask the patient to write the following words as you dictate them. If the patient does not understand, show the real object and gesture to the patient to write its name. If the patient fails(unrecognizable word or not written at all), spell the word orally, and if the patient still fails, provide cut-out letters with 2 extra letters .Subtract ½ point for incorrect letters

		Full score for either		½ score for either	
		Written response Dictated	Written Response visual stimulus	Oral spelling	cut-out letters
ఆఆు	1				
ముఆఆ	2				
మఆఆ్బ	1				
ఆఖ్బఆఆ	2				
ఇఖ్షఆఆు	2				
కొఖ్బఆఆఖు	2				

Maximum Score 10
Patient's score----