Verbs, Nouns, Adjectives, and Adverbs: The Core Lexicon in Aphasia Narratives

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INTRODUCTION

➢ **Discourse Measures**

▪ A variety of measurement approaches to determine differences in discourse between PWA and healthy controls and more common measures have included t-units, type-token ratio, and correct information units (Nicholas & Brookshire, 1993)

▪ Such measures are at risk for low rater reliability (McNeil et al., 2001)

➢ **Core Lexicon**

▪ Lexicon-based analysis is time-efficient and highly reliable because clinicians only have to count how many lexical items are present (McWhinney, Fromm, Holland, Forbes & Wright, 2010)

▪ Core lexicon is meaningful to investigate age-related differences in discourse analysis (Dalton & Richardson, 2015)

➢ **Aphasia Deficits**

▪ PWA have restricted word retrieval performance (Laine &Martin, 2006; Zingeser & Berndt, 1990)

▪ Researchers have reported that PWA have difficulties with verbs and nouns depending on aphasia type (Armstrong, 2001; Berndt, Mitchum, Haendiges, & Sandson, 1997; Gordon, 2008)

▪ However, there is no converging evidence on whether aphasia subtype can be discriminated by specific type of words

PURPOSE OF THE STUDY

To examine the core lexicon in narrative tasks produced by PWA

▪ Is core lexicon agreement significantly correlated with WAB-R AQ score?
▪ Can word type predict aphasia level of severity?

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PARTICIPANTS

470 control participants (252 female, 218 male) & 11 aphasia participants

▪ Normal controls were divided into seven age groups (20s, 30s, 40s, 50s, 60s, 70s, and 80s)

▪ Aphasia Participants

	Age	Gender	Edu	AQ	Aphasia Type
01A	65	M	18	76.3	Conduction
03A	73	M	12	85.2	Anomic
04A	84	F	12	62.6	Conduction
05A	55	M	14	57.6	Broca's
06A	66	F	14	56.3	Broca's
07A	34	F	14	90.7	Anomic
09A	38	F	14	57.7	Broca's
10A	62	F	20	61.3	Broca's
11A	72	M	12	64.9	Transcortical Motor
12A	65	F	11	89.4	Anomic
13A	65	M	14	54.4	Broca's

* Edu = Education; AQ = Aphasia Quotient

METHOD

➢ **Stimuli:**
2 Wordless Picture Book

✓ *Good Dog Carl (GDC, Day, 1985)*
✓ *Picnic (McCully, 1984)*

▪ To create the core lexicon list, lemma forms for nouns, verbs, adjectives, and adverbs were extracted from the transcripts of the normative samples with The Computerized Language Analysis (CLAN, MacWhinney, 2000)

✓ **Lemma Form Extraction in CLAN:**
freq +t%mor +s@"r*,|*,o%" +u +d2 *.gem.mor.pst.cex.

▪ The 25 most commonly used words for each word type were selected as the core lexicon for each age group and story

RESULTS

▪ Percent agreement with the core lexicon for each PWA for *GDC*

	Age	Nouns	Verbs	Adj.	Adv.
01A	60s	36	16	8	4
03A	70s	24	44	16	16
04A	80s	44	32	36	40
05A	50s	36	8	20	16
06A	60s	N/A	N/A	N/A	N/A
07A	30s	56	48	16	20
09A	30s	48	20	16	24
10A	60s	40	16	16	12
11A	70s	8	28	28	32
12A	60s	52	48	20	20
13A	60s	48	8	24	24

▪ Percent agreement with the core lexicon for each PWA for *Picnic*

	Age	Nouns	Verbs	Adj.	Adv.
01A	60s	24	28	28	28
03A	70s	16	28	28	24
04A	80s	24	16	44	36
05A	50s	16	20	8	16
06A	60s	16	12	8	8
07A	30s	36	52	24	16
09A	30s	16	16	16	20
10A	60s	24	8	12	4
11A	70s	8	28	28	32
12A	60s	52	48	28	40
13A	60s	28	4	32	12

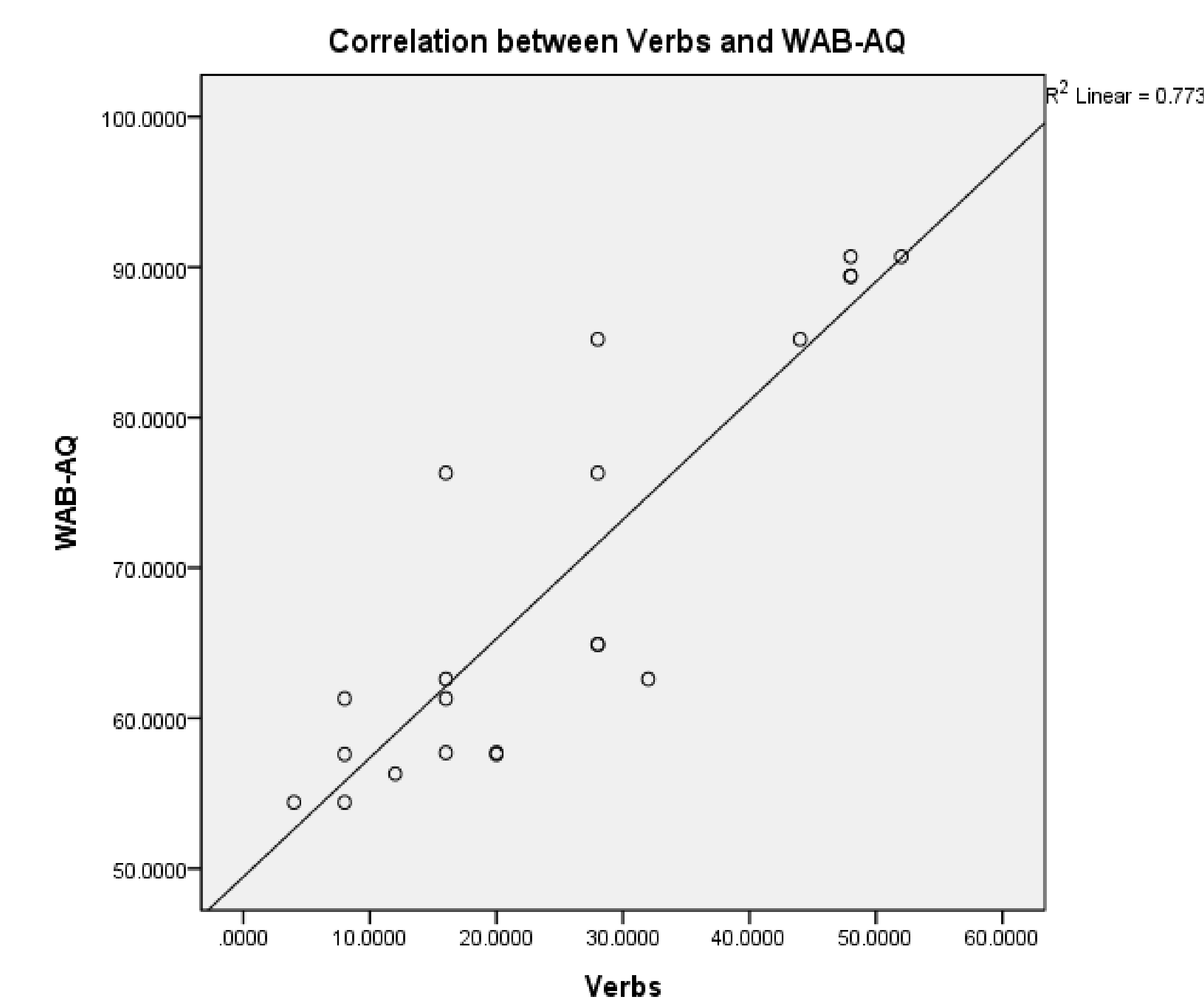▪ Spearman's correlation coefficient between AQ scores and core lexicon agreement for nouns, verbs, adjectives, and adverbs

✓ For *GDC*, Sig. positive correlation between AQ scores and verbs, $r(9)=.869, p<.001$
✓ For *Picnic*, Sig. positive correlation between AQ scores and verbs, $r(9)=.892, p<.001$

▪ Linear regression

✓ For *GDC*: core verbs can highly predictive, $R^2 = .737, p < .005$, and accounted for 74% of the variance
✓ For *Picnic*: core verbs can highly predictive $R^2 = .811, p < .001$, and accounted for 81% of the variance

Correlation between Verbs and WAB-AQ
R^2 Linear = 0.773

DISCUSSION

▪ A simple core lexicon checklist of narrative tasks is useful for capturing aphasia impairment level
▪ Only verbs significantly correlated with aphasia severity
  ▪ Core verbs may be a sufficient factor for predicting the aphasia impairment level
  ▪ Treatments targeting improved verb production may be more meaningful for improving discourse ability
▪ Nouns are deep-rooted type of words, and possibly preserved.
▪ Potentially, a core lexicon could be useful for investigating language performance changes in response to treatment.