



Nouns and Verbs in Naming and Storytelling Tasks in Aphasia: Verbs are Another Story

Kelly M. Johnson, M.A.¹; Jacquie Kurland, Ph.D., CCC-SLP¹; Julia Parker, M.A.¹; Davida Fromm, Ph.D., CCC-SLP²; & Brian McWhinney, Ph.D.²

¹Department of Communication Disorders, University of Massachusetts, ²AphasiaBank, Carnegie Mellon University

INTRODUCTION

• Storytelling closely resembles many aspects of daily human communication exchanges. Although more time intensive to analyze than typical standardized measures of aphasia, such as confrontation naming, discourse such as that elicited by picture description, narrative, and procedural discourse may provide a more accurate measure of the functional communication abilities of persons with aphasia (PWAs).

• AphasiaBank (McWhinney et al., 2011) is an online database of videos and transcripts of narratives produced by controls and PWAs. Despite the immense potential presented by this relatively large sample of aphasic discourse and participant data, no published studies, to date, have tested the relationship between nouns and verbs elicited during the various discourse production tasks and those elicited by the same subjects during confrontation naming tasks.

• The purpose of the current study was to compare the production of nouns and verbs elicited across various tasks in the database to confrontation naming scores in a large sample of fluent and non-fluent PWAs, as well as to the most frequent production of nouns and verbs utilized by control subjects during the same narrative production tasks.

METHODS

Participants

- 142 control participants (n = 73 female; mean age= 65.4; SD = 16.7; range = 23.0 - 87.8)
- 68 participants with aphasia (n = 28 female; mean age = 56.8; SD = 11.2; range = 30.3 - 91.9) grouped by classification as indicated by Western Aphasia Battery-Rev. (WAB-R; Kertész, 2007) AQ scores:

- 35 with Broca's aphasia (n= 10 females, mean MPO = 63.1);
- 11 with Wernicke's aphasia (n= 5 females, mean MPO = 36.3);
- 22 with Conduction aphasia (n= 13 females, mean MPO = 83.9)

Procedures

• Narratives produced by controls and PWAs included three picture description tasks (Figures 1, 2, and 3), a procedural discourse task (describing how to make a peanut butter and jelly sandwich), and telling the story of Cinderella, after first perusing a wordless picture book. Not all tasks were performed by all participants (see Table 1).

	Cinderella	Cat	Umbrella	Window	Sandwich
Controls	139	130	142	142	138
PWA	59	68	68	68	46

Table 1. Total counts of stories obtained from control and aphasia participant groups

METHODS (cont'd)

Figure 1. (Right) AphasiaBank picture description: "Broken Window" (Copyright, L. Menn)

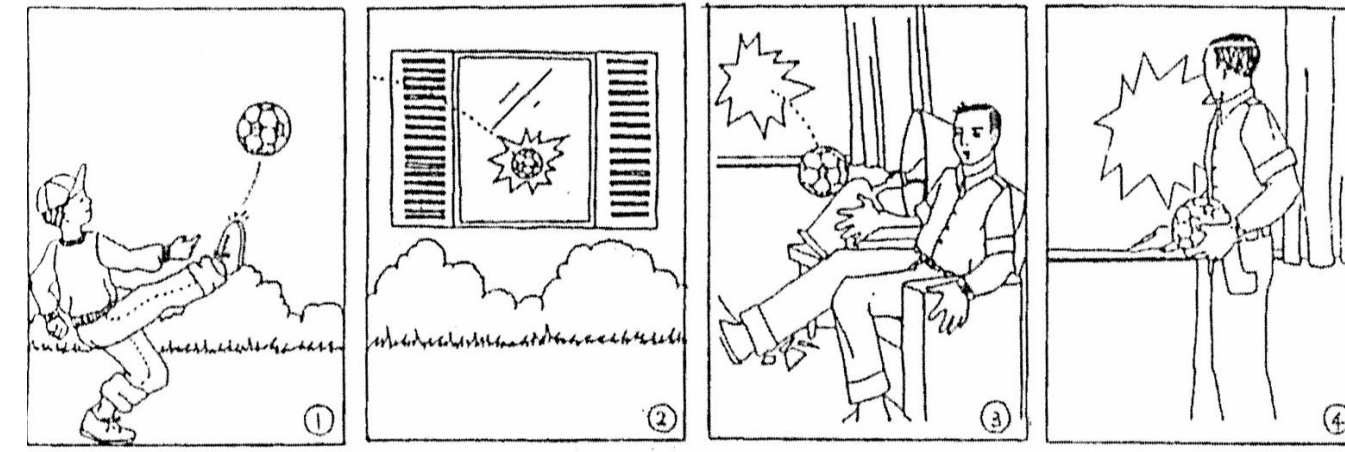


Figure 2. (Below) AphasiaBank picture description: "Refused Umbrella" (AphasiaBank)

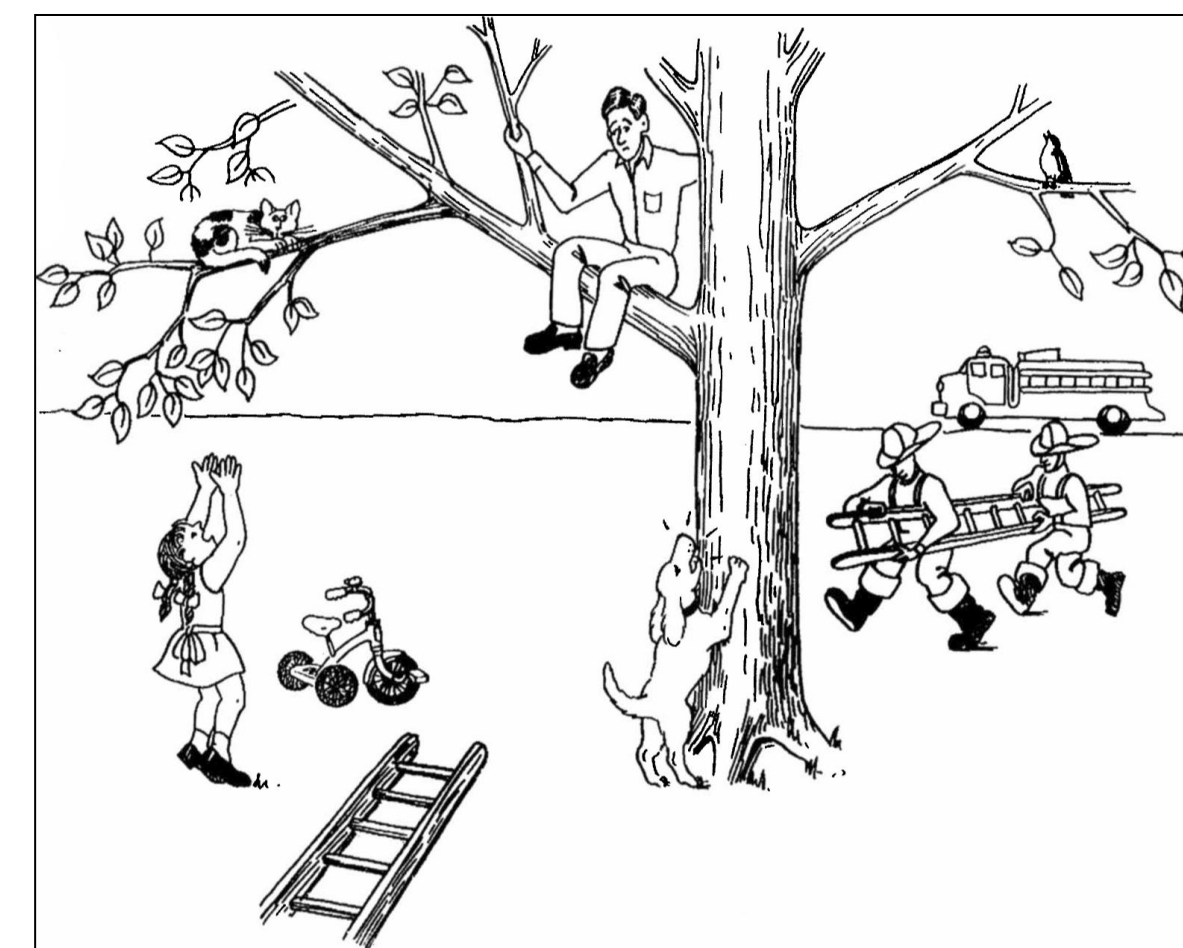
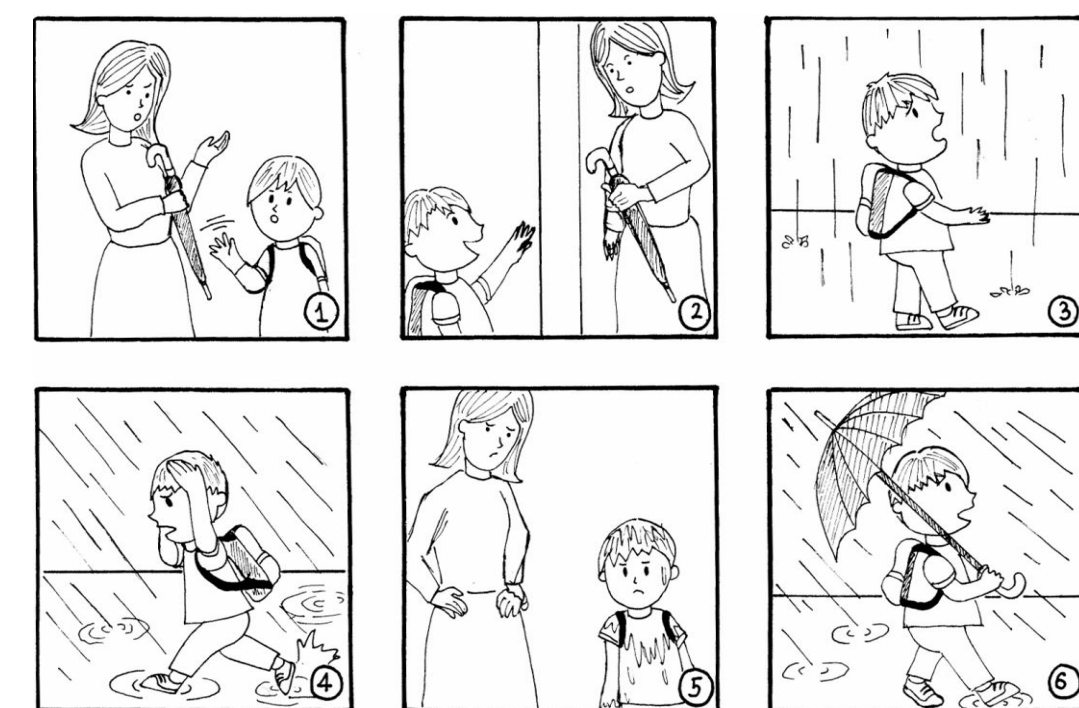


Figure 3. (Right) AphasiaBank picture description: "Cat Rescue" Brookshire & Nicholas, 1993)

• Side comments, repetitions, revisions, and intended target labels were removed from the counts, and all control transcripts were analyzed with CLAN programs (McWhinney, 2001)

• Each of the five stories (Cinderella, Cat, Umbrella, Window, and Sandwich) were analyzed and lists were created of nouns (Table 2) and verbs (Table 3) that were used at least once by at least 10% of the control participants.

• Discourse samples by PWAs were analyzed using CLAN programs to examine to what extent each PWA group used the nouns and verbs from the control 10% lists at least once.

• Pearson's *r* was calculated in SPSS 19 to describe the linear interdependence between nouns and verbs produced during picture description and storytelling tasks versus those produced during confrontation naming tasks (BNT and VNT, respectively).

RESULTS

Table 2. Top 15-20 nouns produced at least once by (#; min. 10%) control participants

#	Cinderella Nouns	#	Cat Nouns	#	Umbrella Nouns	#	Window Nouns	#	Sandwich Nouns
135	Cinderella	130	tree	142	MOM	141	window	138	bread
133	prince	123	cat	142	umbrella	138	ball	138	butter
122	fairy	115	dog	111	school	123	soccer	137	peanut
121	slipper	114	ladder	93	boy	100	boy	128	jelly
120	ball	110	DAD ¹	87	rain	90	lamp	83	slice
117	godmother	101	girl	41	house	72	man	80	piece
102	midnight	85	fire	40	way	60	house	78	knife
100	pumpkin	76	department	37	backpack	48	chair	58	sandwich
96	dress	63	fireman	30	time	47	DAD	56	jar
96	glass	43	bird	23	head	37	neighbor	47	side
92	time	41	man	23	puddle	29	lap	45	top
89	stepmother	36	tricycle	21	clothes	29	yard	41	half
88	daughter	27	branch	21	door	27	glass	36	plate
88	house	26	rescue	17	day	27	kick	29	refrigerator
84	stepsister	25	KITTEN	17	hand	21	room	16	counter
75	horse	24	limb			21	time	15	drawer
71	carriage	17	way			18	son	15	jam
71	foot	15	BIKE			16	day	15	loaf
71	mouse	15	daughter			16	gentleman		
68	mother	14	ground			16	picture		

¹ Capitalized nouns include synonyms, for example, "DAD" includes daddy, father, dad's, etc.

Note: All singular, plural and possessive variations of each noun were counted together

RESULTS (cont'd)

Table 3. Top 15-20 verbs produced at least once by (#; min. 10%) control participants

#	Cinderella Verbs	#	Cat Verbs	#	Umbrella Verbs	#	Window Verbs	#	Sandwich Verbs
137	BE ²	128	BE	141	BE	142	BE	123	PUT
135	HAVE	120	GET	131	GO	125	KICK	100	GET
135	DO	113	COME	123	DO	113	LOOK	91	SPREAD
123	GO	87	CALL	122	GET	112	GO	90	TAKE
123	GET	86	HAVE	108	RAIN	89	sit	59	HAVE
117	FIND	83	CLIMB	107	TAKE	79	BREAK	58	BE
111	(WILL)	67	BARK	97	START	75	PLAY	57	(WILL)
110	COME	62	FALL	93	SAY	68	HAVE	52	CUT
			(CAN/ COULD)						
110	LIVE	62	go	74	need	65	COME	46	DO
102	MAKE	54	go	71	HAVE	64	SEE	39	EAT
100	TRY	53	STICK	66	LOOK	61	KNOCK	37	OPEN
99	FIT	41	RESCUE	62	WALK	53	DO	35	GO
94	MARRY	39	HELP	60	RUN	53	GET	35	MAKE
89	RUN	38	TRY	52	COME	32	HIT	24	want
87	DANCE	37	(WILL)	51	SOAK	30	PRACTICE	22	USE
85	LOOK	34	DO	51	WANT	27	(WILL)	16	lay
84	WANT ³	33	LOOK	48	GIVE	26	LAND	14	need
83	LEAVE	27	RIDE	47	TELL	23	KNOW		
83	TURN	26	CHASE	37	TURN	20	SAY		
82	SAY	26	SEE	37	(WILL)	20	STAND		

¹ CAPITALIZED verbs include infinitives, participles, etc., (e.g., HAVE includes have, has, had, having, etc.)

² Verbs in **bold** are the so-called **weak** verbs that are also among the most frequent verbs

³ *Italicized* verbs include verbs that indicate mental state

⁴ Verbs in (parentheses) indicate modals and auxiliaries

Tables 4 and 5. Correlations between nouns and verbs in confrontation naming (BNT and VNT/NAVS) vs. discourse tasks

		Cinderella Nouns	Cat Nouns	Umbrella Nouns	Window Nouns	Sandwich Nouns
BNT score:	Pearson correlation	0.560**	0.718**	0.408**	0.422**	0.505**
ALL cases	Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000
	N	59	68	68	67	46
BNT score:	Pearson correlation	0.492**	0.764**	0.456**	0.429*	0.539**
Fluent cases	Sig. (2-tailed)	0.007	0.000	0.008	0.013	0.007
	N	29	33	33	33	24
BNT score:	Pearson correlation	0.795**	0.669**	0.386*	0.443**	0.442*
Broca cases	Sig. (2-tailed)	0.000	0.000	0.022	0.009	0.040
	N	30	35	35	35	22

		Cinderella Verbs	Cat Verbs	Umbrella Verbs	Window Verbs	Sandwich Verbs
VNT score:	Pearson correlation	0.262*	0.184	0.189	0.23	0.246
ALL cases	Sig. (2-tailed)	0.045	0.133	0.123	0.057	0.099
	N	59	68	68	68	46
VNT score:	Pearson correlation	0.199	-0.114	0.162	0.112	0.356
Fluent cases	Sig. (2-tailed)	0.300	0.529	0.476	0.537	0.088
	N	29	33	33	33	24
VNT score:	Pearson correlation	0.264	0.394*	0.091	0.314	0.301
Broca cases	Sig. (2-tailed)	0.159	0.019	0.605	0.066	0.173
	N	30	35	35	35	22

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

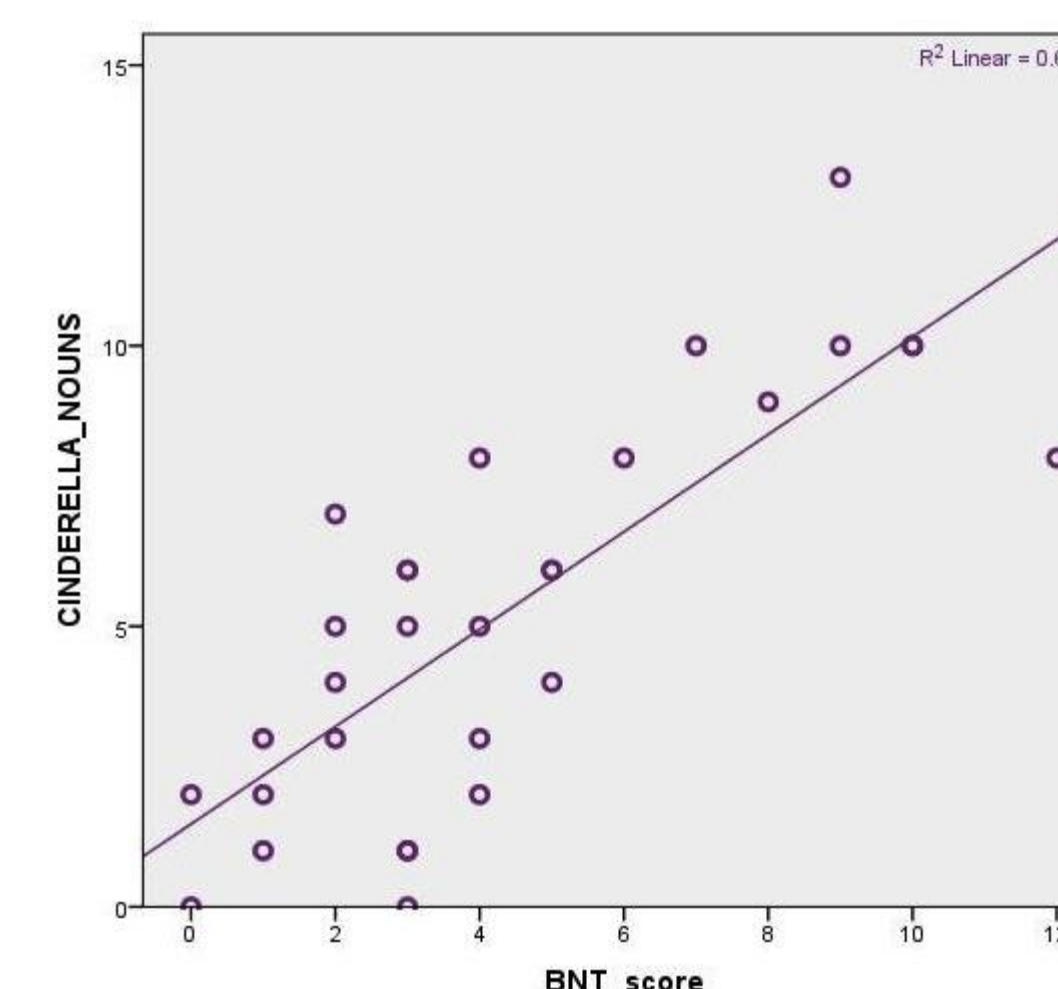


Figure 4. Number of nouns in Cinderella description versus naming (BNT) in BROCA cases

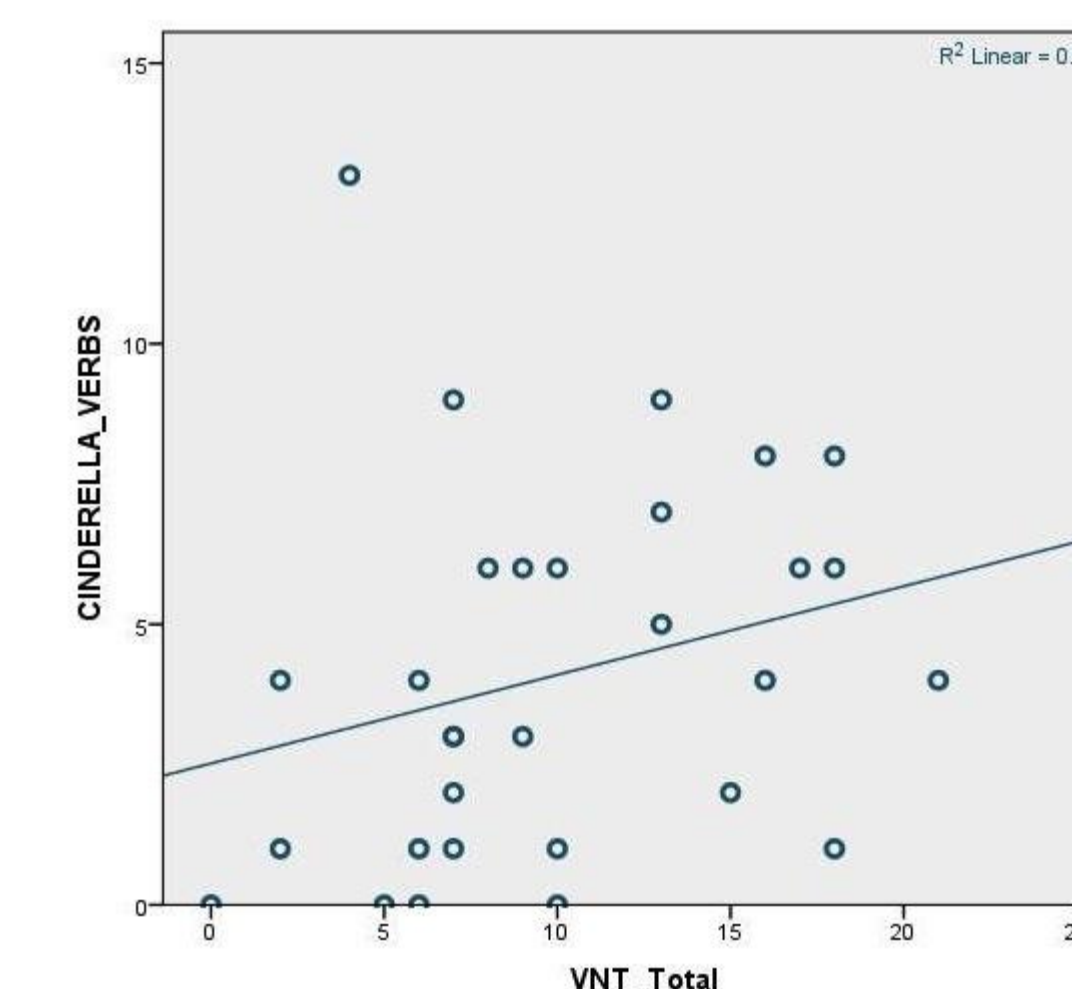


Figure 5. Number of verbs in Cinderella description versus naming (VNT) in BROCA cases

RESULTS (cont'd)

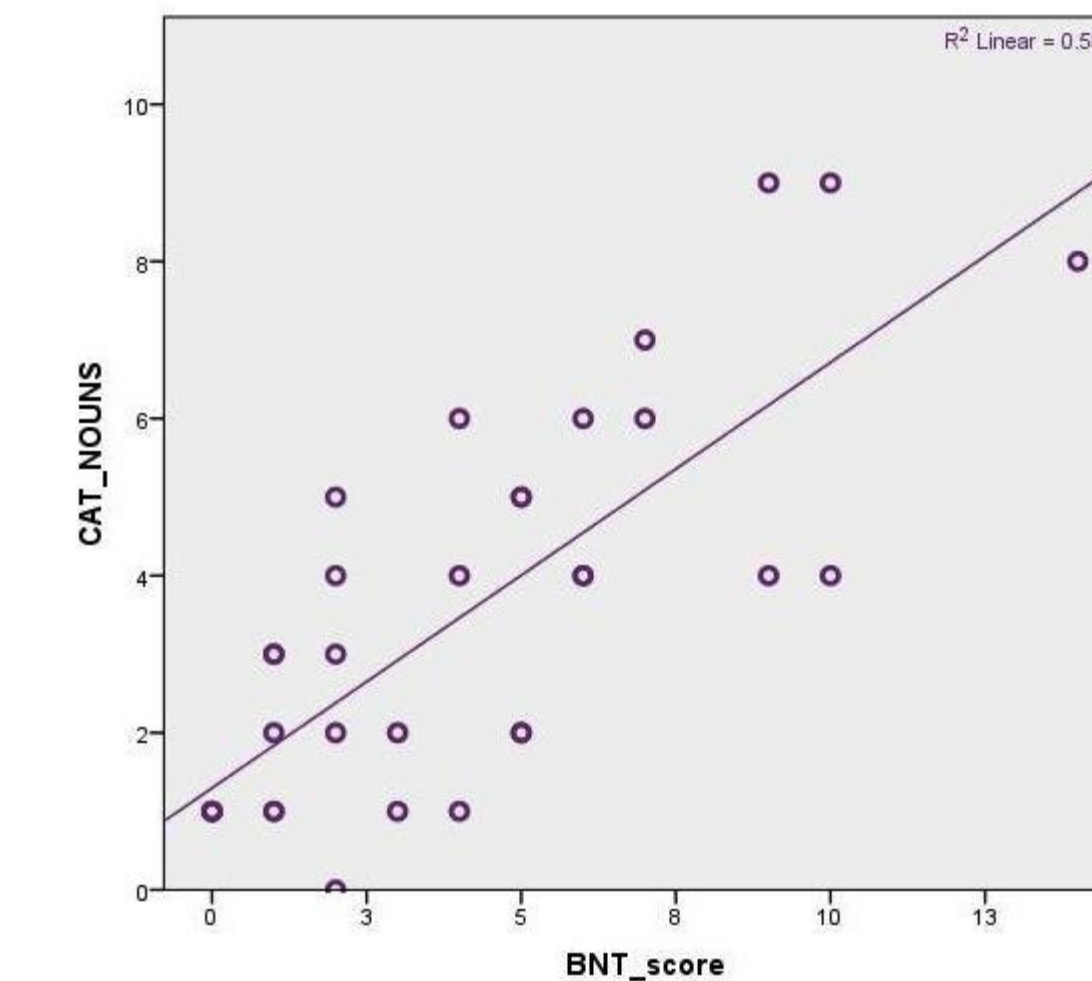


Figure 6. Number of nouns in Cat Rescue description versus naming (BNT) in FLUENT cases

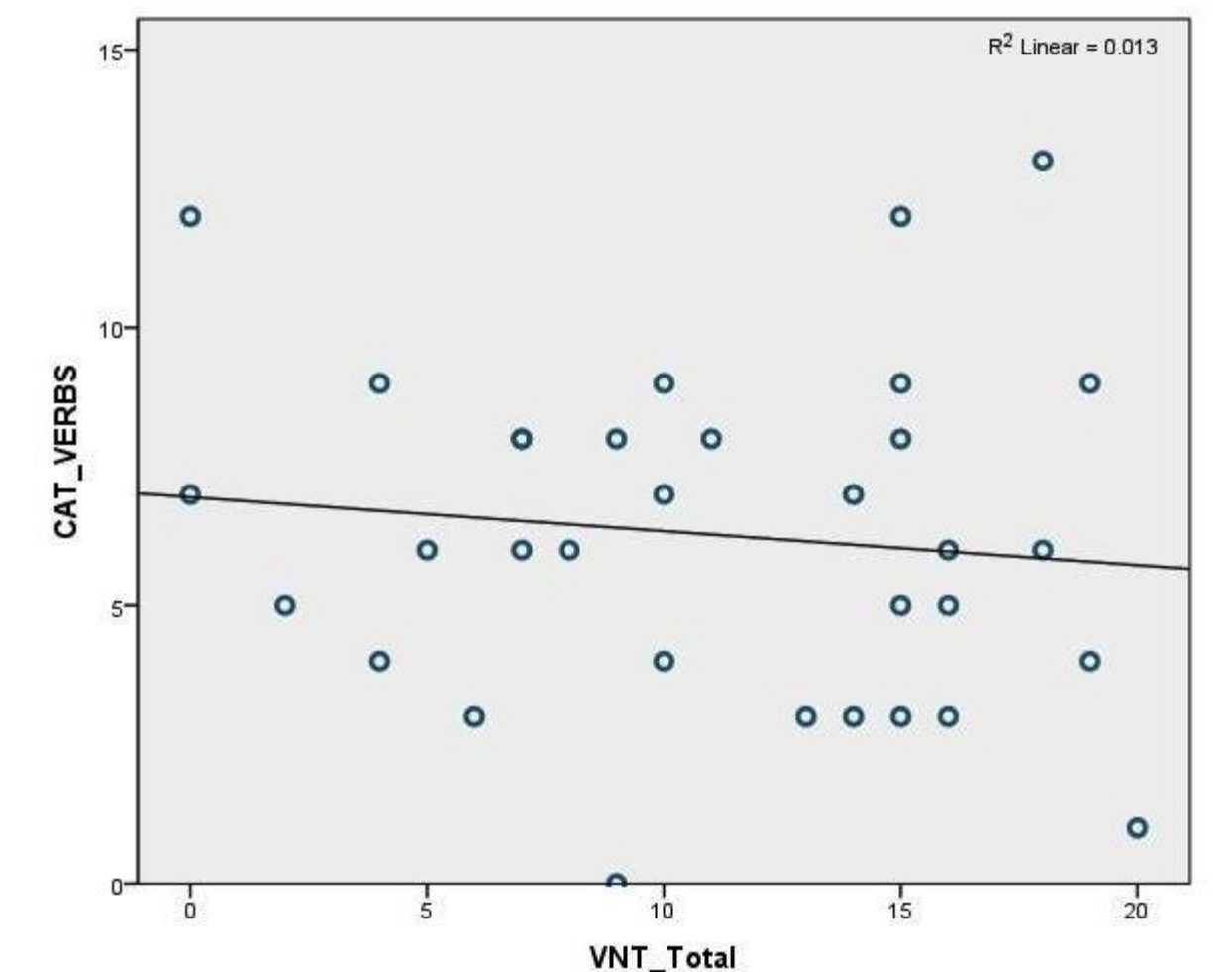


Figure 7. Number of verbs in Cat Rescue description versus naming (VNT) in FLUENT cases

DISCUSSION

• The number of nouns that were accurately produced by all participants with aphasia (PWA's) during the five narrative discourse tasks were all strongly positively correlated with BNT scores.

• Positive correlations between VNT scores and verbs used in discourse were found only in Broca participants' narratives of Cat Rescue, and all PWA's Cinderella narratives. This may be due to the high incidence of weak verbs, verbs indicating mental states, and modals/auxiliaries in storytelling – which are different from verbs elicited during action confrontation naming tasks.

• Noun and verb data from the control samples were originally analyzed to look at content units and main ideas in the narratives produced by PWAs. Despite CLAN being an immensely useful discourse analysis tool, at this time, it cannot be easily and efficiently used to count content units and main ideas without trained judges to check all outputted results.

• Elicitation of narrative discourse in this manner may ultimately be a more efficient way of acquiring information about noun retrieval in aphasia, particularly through use of the two "richer" stories, i.e., Cinderella and Cat Rescue.

• It is hoped that this study will provide a foundation for future investigations examining treatment-induced changes in narrative discourse.

References

- Fergadiotis, G. & Wright, H.H. (2011). Lexical diversity for adults with and without aphasia across discourse elicitation tasks. *Aphasiology*, 25, 1414-1430.
- Kaplan, E. Goodglass, H., & Weintraub, S. (2001). Boston Naming Test (2nd ed.). Austin, TX: Pro-Ed.
- Kertész, A. (2007). Western Aphasia Battery-Revised. San Antonio, TX: Psychological Corporation.
- MacWhinney, B. (2000). The CHILDES Project: Tools for analyzing talk (3rd Ed). Mahwah, NJ: Lawrence Erlbaum Associates.
- MacWhinney, B., Fromm, D., Forbes, M., & Holland, A. (2011). AphasiaBank: Methods for studying discourse. *Aphasiology*, 25, 1286-1307.
- MacWhinney, B., Fromm, D., Holland, A., Forbes, M., & Wright, H. (2010). Automated analysis of the Cinderella story. *Aphasiology*, 24(6), 856-868.
- Thompson, C. K. (2010). Northwestern assessment of verbs and sentences – experimental version. Evanston, IL: Northwestern University Press. Manuscript in preparation.
- Yorkston, K., & Beukelman, D. (1980). An analysis of connected speech samples of aphasic and normal speakers. *Journal of Speech and Hearing Disorders*, (45), 27-36.

Acknowledgments

The current study was conducted with funding from the Faculty Research Grant-Healy Endowment Grant, UMass Amherst (Kurland, PI), as well as travel and training grant funding from AphasiaBank (NIH/NIDCD R01-DC008524; MacWhinney, PI).