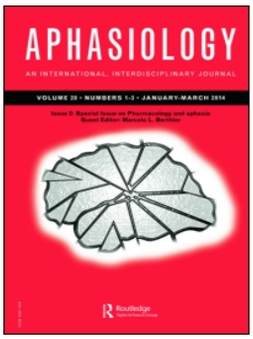

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Comparison of language impairment, functional communication, and discourse measures in African-American aphasic and normal adults

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We compared performance on language impairment, functional communication, and discourse measures between 33 African-American aphasic patients and 30 African-American normal subjects. The aphasic group performed significantly lower than the normal group on the Western Aphasia Battery Aphasia and Cortical Quotients, Token Test, and ASHA Functional Assessment of Communication Skills for Adults. Moreover, the aphasic group performed significantly lower than the normal group in their quality of language on a discourse task that required telling a frightening experience. Significant relationships between performance on the measures were confined to those that index language impairment. Use of a normal ethnic cohort for comparison with African-American aphasic performance may control for potential ethnic bias in the measures. In addition, use of a discourse task permits observation of grammatical and stylistic features in African-American English that may not be captured or are ignored by traditional language impairment and functional communication measures.

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There have been few comparisons of aphasia between African-Americans and Caucasians (Wertz, Auther, Hapner, & Ross, 1997a; Wertz, Auther, & Ross, 1997b). And, to our knowledge, there has been no comparison of aphasia in African-American aphasic patients with performance by African-American normal subjects. The paucity of data on aphasia in African-Americans is surprising, because there have been repeated requests for it (Anderson & Ulatowska, 1978; Taylor, 1992; Wallace, 1993, 1996).

Several reasons prompt interest in aphasia in African-Americans. First, the incidence of stroke and the probability of subsequent aphasia is higher in African-Americans than in Caucasians (Kittner et al., 1990). Second, physical impairment subsequent to stroke may be greater in African-Americans than in Caucasians, and recovery of functional ability may be slower (Horner, Matchar, Divine, & Feussner, 1991). Moreover, initial severity of aphasia may be greater in African-Americans than in Caucasians (Wertz et al., 1997a) and remain more severe following treatment (Wertz et al., 1997a,b). And, third, indexing of aphasic severity with traditional language impairment measures is based, for the most part, on aphasic samples composed of educated, middle-class Caucasians. Thus, there is a possibility of cultural bias in the measures employed (Berndt, 1997; Campbell, 1997; Payne, 1997; Taylor, 1997).

The advent of the World Health Organization's (WHO) classification system (World Health Organization, 1980) has prompted investigators to consider the impact of aphasia not only on language impairment, but also on disability (activities). Previous investigations of aphasia in African-Americans (Wertz et al., 1997a,b) have been limited to assessing language impairment. There are few reports on functional communication in aphasic African-Americans and, more specifically, performance on discourse measures (Ulatowska et al., 1999).

A growing consensus suggests that discourse tasks are sensitive and functional indices of communicative abilities and disabilities in aphasia (Chapman, Highley, & Thompson, 1998; Holland, 1983; Ulatowska & Chapman, 1994). Use of discourse measures in African-American aphasic patients has received only cursory attention (Carter, Walton, Knowles, Wing, & Tyroler, 1992; Ulatowska et al., 1999; Wallace, 1996). The extant clinical discourse literature has focused, primarily, on Caucasians with aphasia (Chapman & Ulatowska, 1994; Ulatowska & Chapman, 1994). Moreover, discourse provides a means to identify ethnic features in communicative style and the degree to which these features are altered by aphasia.

Finally, Campbell (1997) argues that potential ethnocentric bias in neuropsychological research requires a race-homogeneous paradigm to control for culturally linked variations in neuropsychological test performance. Thus, the most appropriate context for comparing and interpreting aphasia in African-Americans may be the normative behaviour of African-Americans.

The purpose of this investigation was to compare performance on language impairment, functional communication, and discourse measures by a sample of aphasic African-Americans with performance by normal, non-brain-damaged African-Americans. We sought answers to two questions. First, do African-American aphasic patients differ significantly from African-American normal subjects on language impairment, functional communication, and discourse measures? Second, are there significant relationships between performance on language impairment, functional communication, and discourse measures within African-American aphasic and normal groups?

METHOD

Subjects

A total of 33 African-Americans, 13 males and 20 females, who were aphasic subsequent to a left hemisphere stroke, and 30 African-Americans, 17 males and 13 females, who had no history of neurological involvement, participated in the study. Aphasic and normal participants were matched, as closely as possible, for age, education, and socioeconomic status. All aphasic participants had suffered a left hemisphere stroke and were at least 2 months post-onset. Both the aphasic (premorbidly) and the normal participants were literate in English. All participants passed sensory screening criteria—vision, no worse than 20/100 corrected in the better eye, and auditory, no worse than an estimated 40 dB speech reception threshold in the better ear. Potential participants were excluded if they had sickle cell disease, psychiatric problems, or dementia. Finally, potential aphasic study participants with severe oral-expressive language deficits were excluded, because they could not produce sufficient language on the discourse task for analysis.

Participant descriptive data are shown in Table 1. There was no significant difference ($p < .05$) in age or education between groups. Similarly, socioeconomic status, rated on a 1–7 scale where 7 = the highest occupational level attained, did not differ significantly ($p < .05$) between groups. Aphasic participants had a mean of 36.7 months post-onset with a range from 2 to 240 months. Mean severity level in the aphasic group, determined by the Boston Diagnostic Aphasia Evaluation (Goodglass & Kaplan, 1983) 0–5 rating scale, where 5 = least severe, was 3.9 with a range from 2 to 5.

Procedure

All participants received a battery of language impairment, functional communication, and discourse measures. Language impairment measures were the Western Aphasia Battery (WAB) (Kertesz, 1982), including all aphasia quotient (AQ) and cortical quotient (CQ) subtests, and the Spreen and Benton (1969) version of the Token Test. The functional communication measure was the American Speech-Language-Hearing

TABLE 1
Descriptive data for the African-American normal (N = 30) and African-American aphasic (N = 33) groups

	Group					
	Normal			*Aphasic*		
Variable	*X*	*Range*	*S.D.*	*X*	*Range*	*S.D.*
Age in years	53.0	43–71	8.89	53.8	40–68	7.75
Education in years	12.8	9–17	1.65	12.9	4–18	2.63
Socioeconomic status*	5.6	3–7	1.12	5.1	2–7	1.19
Months post-onset				36.7	2–240	47.72
Aphasia severity rating**				3.9	2–5	1.01

* Socioeconomic status rated on a 1–7 scale where 7 = highest occupational level attained.

** Aphasia severity rating based on the Boston Diagnostic Aphasia Evaluation 0–5 rating scale where 5 = least severe.

TABLE 2
Rating scale for the quality of the discourse narrative

Dimension	*Description*	Score
Global structure	Evaluates presence of setting, complicating action, resolution, and coda	0–4 points
Temporal sequence	Evaluates chronology of events in the narrative	0–3 points
Reference	Evaluates occurrence of reference errors	0–3 points
Suspense	Evaluates presence of suspense	0–3 points
Coherence	Evaluates continuity of ideas	0–3 points
Clarity	Evaluates clarity of language	0–2 points
Maximum score		18 points

Association Functional Assessment of Communication Skills for Adults (ASHA-FACS) (Frattali et al., 1995).

The discourse task required each participant to relate a personal narrative of a frightening experience. For most participants, this was elicited by an African-American clinician. The quantity of language in the narrative was measured by the number of propositions produced. The quality of the narrative was rated on an 18-point scale (Table 2) divided into six dimensions: global structure, temporal sequence, reference, suspense, (narrative), coherence, and clarity. Two additional analyses focused on ethnic features at the level of sentential grammar and narrative grammar. The presence of features of African-American English vernacular was recorded, and instances of repetition, as an ethnic feature for highlighting information, were identified in each transcript.

RESULTS

Table 3 shows group performance on the language impairment, functional communication, and discourse measures. The African-American normal group performed significantly higher than the African-American aphasic group on all language impairment measures: WAB AQ ($t = 8.302$, $df = 61$, $p < .0001$); WAB CQ ($t = 7.552$, $df = 61$, $p <$

TABLE 3
African-American normal and aphasic group performance on the language impairment, functional communication, and discourse measures

	Group					
	Normal			*Aphasic*		
Measure	*X*	*Range*	*S.D.*	*X*	*Range*	*S.D.*
WAB AQ	98.7	93–100	1.66	83.8	60–99	10.13
WAB CQ	96.7	92–99	2.09	81.3	57–98	11.43
Token Test	152.3	127–163	9.88	106.8	12–163	47.00
ASHA FACS	6.9	6–7	0.48	5.9	4–7	1.35
Discourse Quantity*	32.4	5–119	28.52	23.1	4–161	28.40
Discourse Quality**	16.0	8–18	2.49	12.9	1–18	4.52

* Number of propositions.
** Rating on 18-point scale.

.0001); and Token Test ($t = 5.425$, $df = 61$, $p < .0001$). Similarly, the African-American normal group achieved significantly higher scores than the African-American aphasic group on the ASHA FACS ($t = 4.678$, $df = 61$, $p < .0001$). On the discourse task, there was no significant difference between groups in the quantity of language, measured in the number of propositions produced, ($t = 1.254$, $df = 61$, $p > .05$). However, the African-American normal group achieved a significantly higher quality rating than the African-American aphasic group ($t = 3.409$, $df = 61$, $p < .001$).

Of the normal participants, 28 (93%) met, or exceeded, the 93.8 normal ''cut-off'' AQ score on the WAB (Kertesz, 1979, p. 64). One of the normal participants who scored below the ''cut-off'' attained an AQ of 93.3 and was unclassifiable in the WAB taxonomy. The other normal participant who scored below the ''cut-off'' attained an AQ of 93.5 and classified as anomic in the WAB taxonomy. Six of the aphasic participants (18%) exceeded the 93.8 WAB AQ normal ''cut-off'' score. However, three of these scored below Kertesz's (1979, p. 64) normal ''fluency criterion'' of 10, and all were classified as mildly aphasic on the BDAE rating scale. Of the remaining 27 aphasic participants, 2 were classified as nonfluent (1 Broca's aphasia and 1 transcortical aphasia), and 25 were classified as fluent (2 conduction aphasia, 16 anomic aphasia, and 7 unclassifiable).

The results of analyses of relationships between language impairment, functional communication, and discourse measures for the African-American normal group are shown in Table 4. The significance level was adjusted to $p < .003$ to accommodate the number of correlations computed. The sole significant relationship was between the WAB CQ and the Token Test ($r = .554$, $p < .001$). Relationships between measures for the African-American aphasic group are shown in Table 5. All significant relationships were confined to the language impairment measures: WAB AQ and WAB CQ ($r = .831$, $p < .0001$); WAB AQ and Token Test ($r = .548$, $p < .001$); and WAB CQ and Token Test ($r = .672$, $p < .0001$).

Features of African-American English vernacular were present in the discourse productions of both groups. These included verb features, for example, remote aspect ''bin'', as in ''He bin running'', ''gon'', as in ''Somebody gon get him.''; and absent copula, as in ''They little pellets.'' In addition, stylistic features of African-American English were found in both groups, for example, frequent use of repetition (e.g., ''...footsteps, heavy footsteps, more than one set of footsteps...'') and frequent use of direct speech (e.g., ''He said, 'It kinda look like she done had a stroke.' ''). Both the vernacular verb forms and ethnic repetition were preserved in the group with aphasia.

TABLE 4
African-American normal group correlations

	WAB CQ	*Token Test*	*FACS*	*FE Quant*	*FE Qual*
WAB AQ	.39	.48	.21	.13	.01
WAB CQ		.55*	−.18	−.07	.41
Token Test			.14	−.30	.46
ASHA FACS				−.02	.08
FE Quantity					−.27

Correlations between language impairment, functional communication, and quantity and quality of performance on the ''frightening experience'' (FE) personal narrative discourse task for the African-American normal group.

* Significance levels were adjusted for the number of correlations to $p < .003$.

TABLE 5
African-American aphasic group correlations

	WAB CQ	*Token Test*	*FACS*	*FE Quant*	*FE Qual*
WAB AQ	.83*	.55*	.45	.45	.45
WAB CQ		.67*	.33	.31	.30
Token Test			.19	.24	.01
ASHA FACS				.20	.27
FE Quantity					.28

Correlations between language impairment, functional communication, and quantity and quality of performance on the ''frightening experience'' (FE) personal narrative discourse task for the African-American aphasic group.

* Significance levels were adjusted for the number of correlations to $p < .003$.

However, certain simplifications and alterations were noted, especially for patients with more severe aphasia. Additional examples of vernacular verb use and ethnic repetition, with comments on their significance, are included Appendix A.

DISCUSSION

As anticipated, the African-American aphasic group performed significantly lower than the African-American normal group on all language impairment, functional communication, and discourse measures except the quantity of language produced in the discourse task. Failure to find a group difference on the number of propositions produced may have resulted from the severity of aphasia in the African-American aphasic group. The mean WAB AQ was 83.8 with a range from 60 to 99. Thus, many of the aphasic participants could produce a large number of propositions on the discourse task, and their performance differed from the normal group only in the quality, not the quantity, of their productions. Within the quality dimensions, shown in Table 2, temporal sequence was similar between groups. However, the reference, clarity, and suspense dimensions were lower in the aphasic group than in the normal group. Useful appraisal of discourse in aphasic adults is often limited to moderately to mildly impaired aphasic patients in order to obtain a sufficient language sample for analysis. This requirement, in our sample, suggests the need for a qualitative analysis in addition to a quantitative analysis to explore how, and whether, aphasic discourse may differ from normal discourse.

Perhaps the importance of this investigation is its use of a race-homogeneous (within-race/ethnic group comparison) paradigm. Campbell (1997) observes that the relationship between race/ethnicity and neuropsychological test performance has been slow to emerge as a valid and legitimate issue. He argues that race-comparative (African-American versus Euro-American) comparisons may yield an ethnocentric bias that leads not only to spurious interpretations, but also to constraints on the definitions and measurement of neuropsychological processes and competencies in African-Americans. Our results, employing a normal ethnic cohort to determine the presence and severity of aphasia in African-Americans, implies that the measures used—WAB AQ, WAB CQ, ASHA FACS, and quality of narrative discourse—differentiate African-American aphasic performance from African-American normal performance. Thus, if the measures are culturally biased, employing a race-homogeneous comparison—normal African-Americans compared with aphasic African-Americans—may have equated potential bias across groups.

Comparison of performance by our normal and aphasic African-American samples with normative data on the WAB and Token Test is problematic for at least three reasons. First, normative data for both measures are sparse. Second, Kertesz (1979) and Spreen and Benton (1969) do not report racial information in their normative samples. Third, the moderate to mild severity criterion in our aphasic sample, is probably not representative of the severity range in either African-American or Caucasian aphasic people. Nevertheless, as indicated earlier, 28(93%) of our normal participants exceeded the 93.8 WAB AQ normal ''cut-off'' score, and 27 (82%) of our aphasic participants fell below the ''cut-off''. On the Token Test, 19 (63%) or our normal participants performed within Spreen and Benton's normal range (153–163). Of our aphasic participants, 4 (12%) performed within the normal range, and 29 (88%) performed within the aphasic range (12–152). Again, the lack of information about racial distribution in the WAB and Token Test ''normative'' data and the restricted range of severity in our aphasic sample do not permit any inference about cultural bias in these measures.

Our second research question explored the relationships between performance on the language impairment, functional communication, and discourse measures. The results indicate that all significant relationships were confined to the language impairment measures. The presence of only one significant relationship in the African-American normal group—WAB CQ and Token Test—may have resulted from the restricted range of performance on most measures within this group. In the African-American aphasic group, three significant relationships emerged—WAB AQ and WAB CQ, WAB AQ and Token Test, and WAB CQ and Token Test. The failure to observe significant relationships between language impairment measures and functional communication and discourse measures may suggest that the measures are assessing different domains. However, empirical evidence to support the suggestion is beyond the power of correlational analysis. Nevertheless, failure of one type of measure to predict performance on the others may imply that all three are necessary to provide an adequate assessment of communicative ability and disability.

The discourse task—a personal narrative of a frightening experience–permitted the eliciting of a large amount of language in both the normal and aphasic African-American groups. Personal narratives have been widely used in the ethnographic literature (Labov, 1972; Polanyi, 1989). Moreover, the task may be particularly appropriate clinically (Kenyon, 1996) if the goal is to assess natural language, specifically the language that contains the ethnic markers of the group in question. Our participants' narratives were, typically, autobiographical, and, as a result, they appeared to be well rehearsed and, therefore, may have revealed optimal performance. The participants' topics, in order of frequency of occurrence, were: accidents, crime/violence, death/illness, phobias, fear of animals, supernatural phenomena, rape/abuse, and hazardous weather conditions. Thus, the emotional salience in the task may have increased motivation to communicate, which may not be present in the more constrained tasks characteristic of language impairment measures.

Finally, personal, narrative discourse tasks may be particularly appropriate for assessing African-American aphasic patients. For example, in African-American communities, personal narratives provide a key means of intergenerational transmission of cultural heritage and family values (Wallace, 1996). Also, the informal speaking style employed in a personal narrative permits identification of code-switching, for example, the presence of African-American English vernacular at the sentential level (Labov, 1972) and the use of repetition at the discourse level to highlight themes in the narrative

(Etter-Lewis, 1991). When these ethnic features occur, one must be careful not to mistake them as aphasic features, in instances where there is superficial similarity in form and function.

Again, to our knowledge, this investigation represents the first race-homogeneous comparison of normal and aphasic behaviour in African-Americans. Answers to additional questions, for example, comparison of severity of aphasia between African-Americans and Caucasians and the presence of cultural bias in measures for aphasia, will require a combined race-homogeneous and race-comparative design that includes samples of normal African-Americans and Caucasians and aphasic African-Americans and Caucasians. These investigations are compelling given the continued reports (Mitchell & Ballard, 2000) that African-Americans who present with a possible stroke are less likely than Caucasians to receive diagnostic tests, to have a neurologist as the attending physician, or to receive surgery to prevent stroke.

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APPENDIX A

Examples from personal narratives of African-American normal and aphasic participants.

Note the preservation of a variety of ethnic verb features (past perfect, perfective *done*, and present tense form for past tense).

(Individual with aphasia) ''Because uh, what **had happened**, a **lady had died** that time. Me and some more people, some children **come** and scared people about the lady, the lady **done died** you know. So the lady died, when they **come** back, and they **say** . . .''

Variability in use of vernacular verb forms, or absence of morphemes, is part of the dialect and is not necessarily associated with aphasia.

(Individual with mild aphasia). ''But I remember **we were afraid** to get up. **We was scared** to get up.'' (Variability in concord)

(Normal control) ''And he said, '**We looking for him**.'' And I said, '**What is you talking about**' . . .'' (variable deletion of auxiliary)

Ethnic repetition for emphasis is preserved, as seen in comparison with a normal control.

(Individual with mild aphasia) ''As I was walking, I hear these **footsteps** behind me, **heavy footsteps, more than one set of footsteps**.''

(Normal control) ''. . . so **we started running** and **we ran**, CaSaundra, **I never ran so hard in my life. We ran and we were screaming and hollering** for our parents.''

Note simplified lexicon and syntax in other instances of ethnic repetition, as compared to the performance of a normal control.

(Individual with aphasia) ''When I had the stroke, **I was scared**. And I was, **I was, scared**, I don't know . . . **I was scared**. I stopped talking. **I was scared**.''

(Normal control) **That was the scariest thing** that happened to me. **It was terrifying actually**, because you could see what was happening, you could see it. I mean as it swirled in the air and hit the ground, we could see it, I could see it slidin' along in the field. **That was the scariest thing**. . .''