

# Developing a Clinician-Friendly Aphasia Test

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**Purpose:** The Kentucky Aphasia Test (KAT) is an objective measure of language functioning for persons with aphasia. This article describes materials, administration, and scoring of the KAT; presents the rationale for development of test items; reports information from a pilot study; and discusses the role of the KAT in aphasia assessment.

**Method:** The KAT has 3 parallel test batteries, KAT-1, KAT-2, and KAT-3. Each battery contains the same orientation test and 6 subtests, each with 10 items, assessing expressive and receptive language functions. Subtests for KAT-1, KAT-2, and KAT-3 systematically increase in difficulty so that it is possible to assess individuals with severe, moderate, and mild aphasia, respectively. The KAT was administered to 38 participants with aphasia and 31 non-brain-damaged (NBD) participants.

**Results:** Results with the KAT clearly differentiated the language performance of individuals with and without aphasia. NBD participants made few errors, and overall scores on the test for individuals with aphasia were rarely within 1 *SD* of the NBD group. Performance of the participants with aphasia administered KAT-1, KAT-2, and KAT-3 suggested that the 3 versions of the test represent a hierarchy of difficulty.

**Conclusions:** The KAT remains in its early stages of development. However, it does appear to meet the requirements for a “clinician-friendly” aphasia test and, as such, offers a rapid, convenient means of obtaining an objective score to determine changes in language functioning during the early postonset period.

**Key Words:** aphasia, test, managed care

Aphasia test batteries have been used by clinicians to assess persons with aphasia (PWA) for nearly a century. The first test batteries used to characterize the speech, language, and cognitive deficits of PWA were developed shortly before and after World War II (Eisenson, 1946; Goldstein, 1948; Head, 1926; Weisenburg & McBride, 1935). Additional measures were developed between 1960 and 1982 as interest in aphasia rehabilitation grew and objective measures were needed to measure the effects of its treatment. Some tests such as Examining for Aphasia (Eisenson, 1946), the Language Modalities Test for Aphasia (Wepman & Jones, 1961), and the Neurosensory Center Comprehensive Examination for Aphasia (Spren & Benton, 1977) are rarely used today. Others, however, such as the Minnesota Test for Differential Diagnosis of Aphasia (MTDDA; Schuell, 1972), Porch Index of Communicative Ability (PICA; Porch, 1981), Boston Diagnostic Aphasia Examination (BDAE; Goodglass & Kaplan, 1983), and the Western Aphasia Battery (WAB; Kertesz, 1982), continue to have widespread use (Byng, Kay, Edmundson, & Scott, 1990) and are taught to graduate students in communication disorders and sciences as part of their clinical training (Brookshire, 2003).

Few would dispute the need to conduct a comprehensive assessment of the PWA before starting intervention. The MTDDA, PICA, BDAE, and WAB have met this need for decades, but using these tests to assess PWA in today's health care system is problematic for several reasons (Golper & Cheney, 1999). The first is that clinicians have less time to devote to assessment now than in the era before managed care. The BDAE and MTDDA have multiple subtests and, in our clinical experience, can take up to 2 hr to give, particularly if the client's aphasia is severe. The PICA and the 1982 version of the WAB can usually be completed in less than an hour. However, 40 hr of training (Porch, 1967) are required for a clinician to be able to use the PICA's multidimensional scoring system reliably. This may be impractical for many clinicians (Lincoln, 1988). A second problem is that clinicians are now obligated to conduct an assessment of the PWA earlier in the poststroke course, frequently at bedside. Both the PICA and the WAB contain materials (cards, objects, pictures) and forms that restrict their administration in less than optimal settings, particularly if the client is not medically stable. Finally, most aphasia tests in use today were designed to assess PWA in the middle

of the severity continuum. It has been suggested that these lack a sufficient “top” (difficult tests) or “bottom” (easier tests) to adequately assess clients with mild and severe aphasia, respectively (Brookshire, 2003; Darley, 1983; Miller, Willmes, & de Belser, 2000; Raymer & LaPointe, 1986). When more time was available for testing, clinicians could compensate for this by administering supplementary tests, and in some cases, devising their own measures. However, managed care neither supports nor allows time for this.

One way to compensate for the constraints on aphasia assessment brought about by managed care is to develop “clinician-friendly” tests. Ideally, these would be measures that (a) could be given in their entirety in a short time frame, (b) compensate for floor and ceiling effects and could be used with PWA across the severity continuum, and (c) are convenient to administer in all patient care settings. Time spent in testing PWA can be reduced by using short versions of aphasia test batteries (Disimoni, Keith, & Holt, 1975; Goodglass, Kaplan, & Barresi, 2001; Kertesz, 2006; Schuell, 1972) and aphasia screening tests (Crary, Haak, & Malinski, 1989; Fitch-West & Sands, 1998; Helm-Estabrooks, 1992; Keenan & Brassell, 1975; Sklar, 1983). However, modifications of longer aphasia tests and screening tools are rarely standardized (Golper & Cheney, 1999) and do not meet, or only partially meet, other desirable features of a clinician-friendly test.

This article provides information on the Kentucky Aphasia Test (KAT; Marshall & Wright, 2002). The KAT is an impairment-based, objective measure of language functioning for use with individuals with aphasia secondary to a stroke. It is intended to provide clinicians with a means to quantify changes in language functioning during the early postonset period when the individual is moving from one patient care setting to the next.<sup>1</sup> In developing this experimental version of the KAT, the time and physical constraints imposed on clinicians working in managed care settings were given paramount consideration. The KAT contains only an orientation test, a picture description task, and six 10-item subtests to assess expressive and receptive functions. Reading and writing subtests were not included in the KAT, not because they are not important to assess, but because these skills are usually the most impaired in aphasia, take more time to assess, and tend to receive less attention in the early posttreatment period when the focus is on improving comprehension and message exchange skills that will allow the client to communicate with his or her caregivers (Holland & Fridriksson, 2001; Marshall, 1997; Murray & Holland, 1995). The KAT has three parallel test batteries: KAT-1, KAT-2, and KAT-3. The three batteries increase systematically in difficulty and complexity in order to facilitate assessment of individuals with severe, moderate, and mild aphasia, respectively. This “three-in-one” arrangement

permits the clinician to assess any client with aphasia with the KAT and eliminates the need to devise hybrid protocols to assess clients at upper and lower ends of the severity continuum. The scoring system of the KAT requires no special training to use. It combines features of the multi-dimensional scoring system of the PICA (Porch, 1967) and the communication-based system of the Communication Activities of Daily Living, Second Edition (CADL-2; Holland, Fratalli, & Fromm, 1998). Thus, it allows the examiner to record response features such as delays and self-corrections, and it gives the client credit for responding correctly in modalities other than speaking (gesture, drawing, writing, pointing).

The purposes of this article are to (a) describe the materials, administration, and scoring of the KAT and the rationale underlying development of test items; (b) report test scores and sensitivity information for participants with and without aphasia and provide information on the scoring and test-retest reliability; and (c) discuss the role of the KAT in present-day assessment practices of PWA.

## KAT Development

### Orientation

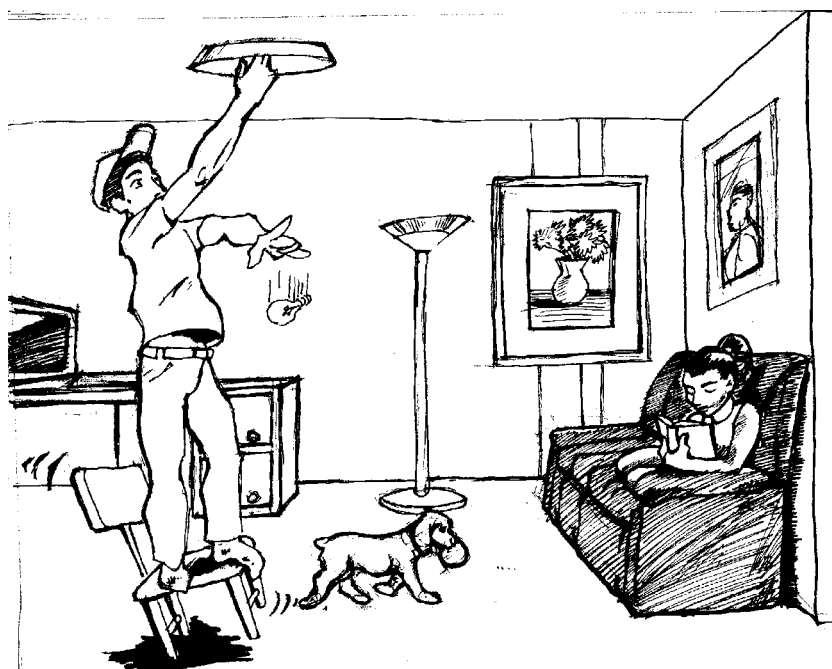
To begin the test, the clinician administers the orientation test shown in Appendix A. The orientation test is identical for KAT-1, KAT-2, and KAT-3. It requires the client to perform 10 tasks involving reading, writing, and pointing. Items for the test were constructed similarly to those used in the Reading Comprehension Battery for Aphasia, Second Edition (LaPointe & Horner, 1998), the CADL-2 (Holland et al. 1998), and the Assessment of Language-Related Functional Activities (Baines, Martin, & Heeringa, 1999). The orientation test is used (a) to establish rapport with the client, (b) to “settle” the individual into the testing situation, and (c) to provide the clinician with supplementary information about the client’s speech and language functioning.

### Picture Description Task

The client’s performance on the picture description task guides the clinician’s decision to administer KAT-1, KAT-2, or KAT-3. For this task, the client describes the *divided attention* picture shown in Figure 1. This picture was developed by providing a commercial artist with several types of elicitation stimuli that have been used to elicit connected speech samples from clients with communication disorders. Using these as guidelines, the artist constructed several drawings, one of which was eventually chosen by the authors. For this task, the examiner places the picture in front of the client and says, “Tell me what is going on in this picture.” The client is given as much time as needed to complete the task. In the development of the KAT, 63 non-brain-damaged (NBD) adults (33 men and 30 women) ranging from 19 to 78 years of age ( $M = 36.60$ ,  $SD = 16.04$ ) and having from 12 to 18 years of education ( $M = 14.78$ ,  $SD = 2.10$ ) described the picture. Their narratives were transcribed verbatim, and the content units (nouns and verbs) listed in Appendix B were identified. The number of content units produced by the NBD volunteers ranged from 6 to 24

<sup>1</sup>We consider the early postonset period to encompass the first 3 months after a stroke causing aphasia. This is a time when the individual may be seen for speech and language assessment and treatment in a variety of settings (acute care, general hospital ward, rehabilitation, nursing home, home health, outpatient) and when most rehabilitation services are received in the managed care system.

FIGURE 1. Divided Attention picture.



( $M = 16.64$ ,  $SD = 4.62$ ). This value falls midway between those of younger ( $M = 18.0$ ,  $SD = 4.7$ ) and older NBD participants ( $M = 14.7$ ,  $SD = 3.6$ ) who described the Cookie Theft picture from the BDAE in a study by Yorkston and Beukelman (1980). We made a decision to administer KAT-1 to any PWA who produced from 0 to 5 content units because this was fewer than the number of content units from any NBD participant, and we opted to administer KAT-2 and KAT-3 when the number of content units was 6 to 10 or  $\geq 11$ , respectively. This decision was primarily made to be consistent across the three versions of the KAT, but it should be pointed out that these values are consistent with those from Yorkston and Beukelman (1980) for participants with low-moderate ( $M = 10.5$ ,  $SD = 2.5$ ) and mild aphasia ( $M = 16.4$ ,  $SD = 3.3$ ).

Whereas the results of the picture description task do not contribute to the overall score for the KAT, this task does provide information about the client's articulation, use of propositional language, semantic production, and syntax that is useful in characterizing the client's speech and language abilities. Our rationale for using results of the picture description task as an "indicator" of severity and to determine which version of the KAT to give was based on the fact that in the early postonset period, most PWA are concerned about their verbal communication status, and the patient's ability to communicate verbally is a common standard by which early progress is judged. We are cognizant that using the number of content units produced on a picture description task as an indicator of severity has some limitations. For example, in some cases it could result in a less difficult version of the test being given to a client with a co-occurring motor speech problem or a more difficult

version being given to a fluent client with severe aphasia and good motor skills.

### Subtests

The KAT has six 10-item subtests. Three—Picture Naming, Repetition Span, and Defining Words—assess expressive abilities. Three others—Following Commands, Yes/No Questions, and Word-to-Picture Matching—assess receptive functions. Stimuli for each of the subtests, instructions, administration procedures, scoring, and other special circumstances surrounding administration of each subtest are provided in Appendix C.

*Picture Naming.* Items for the Picture Naming subtest are black-and-white drawings approximately 2.5 in.  $\times$  3 in. in size. Task difficulty was determined on the basis of frequency of occurrence (Kucera & Francis, 1967) of the target words. Mean frequencies for words selected for KAT-1, KAT-2, and KAT-3 are 125.4 ( $SD = 58.3$ ), 55.1 ( $SD = 14.6$ ), and 17.4 ( $SD = 11.3$ ), respectively. Frequency of occurrence indicates how common the target words are; the numbers represent the average frequency of occurrence per 1 million words.

*Following Commands.* On this subtest, the client follows spoken commands requiring the identification of body parts. KAT-1 involves one- and two-step commands involving body parts only (e.g., make a fist). KAT-2 commands increase in difficulty by adding right-left distinctions (e.g., make a fist with your left hand). Two-step commands involving right-left discriminations are also used for KAT-3, but the commands are made more difficult by having the client make distinctions between the adverbs *before* and *after* (e.g., after you touch your right knee, raise your hand).

**Defining Words.** To develop the Defining Words subtest, a large corpus of lexical items was selected using guidelines for frequency similar to the Picture Naming task. A sample of 30 NBD adult volunteers provided written definitions for each of the items. Items for KAT-1, KAT-2, and KAT-3 were chosen from the written definitions that reflected greatest consensus and least variability (see Appendix D).

**Repetition Span.** The Repetition Span subtest requires the client to repeat a series of numbers after the examiner. Span length is systematically increased from battery to battery by increasing the number of syllables to be repeated. Span length for KAT-1 items ranges from 1 to 3 syllables, span length for KAT-2 ranges from 4 to 6 syllables, and span length for KAT-3 ranges from 7 to 9 syllables. This method for assessing repetition span differs from that of aphasia test batteries, which include repetition tasks of words, phrases, and sentences, and that of the MTDDA, which uses digit strings. The rationale for using a syllable rather than a word metric was based on the need to have precise control of span length and to minimize the effects of linguistic redundancy and memory demands for the task. Also, having the client repeat numerical values (e.g., 92, 309) rather than digit strings (e.g., 3, 8, 1) facilitates examiner control of presentation rate. While there are no data to support the use of syllables over words or digit strings, it has been shown that experienced clinicians alter their speaking rates in the presentation of sentences (Token Test commands) in accordance with the severity of the client's aphasia (Salvatore, Strait, & Brookshire, 1978).

**Yes/No Questions.** Stimuli for the Yes/No Questions subtest were developed using guidelines from the aphasia literature regarding the processing of yes/no questions (Brookshire, 2003; Brookshire & Nicholas, 1980; Deloche & Seron, 1981; Gray, Hoyt, Mogil, & Lefkowitz, 1977; Kudo, 1984). KAT-1 includes nonfalsified, nonreversible questions requiring no inference (e.g., Do dogs bark?). KAT-2 questions contain falsified information (e.g., Do elephants have fins?), reversible sentences (e.g., Do doctors work for nurses?), and a need for inference (e.g., Does everyone save money?). KAT-3 questions have similar features to those for KAT-2 but also require the client to make comparisons (e.g., Are men larger than boys?).

**Word-to-Picture Matching.** For the Word-to-Picture Matching subtest, the client points to one picture in a field of five following a request from the examiner. The task is introduced with a single practice item that is identical for each version of the KAT. Each version of the KAT requires identification of five nouns and five verbs. On each KAT battery, the stimuli are systematically reordered to change the position of the target picture from item to item. On KAT-1, noun (ball, car, dog, table, and tree) and verb pictures (throw, drive, run, eat, and chop) are not semantically related. For KAT-2, the level of difficulty is increased by using semantically related nouns (apple, orange, pear, banana, and grapes) and increasingly abstract verbs (mounting, peeking, melting, opening, and acting). Stimuli for KAT-3 include five abstract nouns (convex, sphere, triangle, rectangular, and conical) and verbs (diverging, converging, paralleling, intersecting, and angling). The items of KAT-3 are at variance with those for KAT-1 and KAT-2. The reason for this is the

difficulty encountered in finding pictures for KAT-3 that would challenge clients with mild aphasia. Thus, we elected to use geometric forms, which are also included on the BDAE (Goodglass & Kaplan, 1983), while acknowledging that these stimuli might be familiar to a client with a background in architecture or a related subject.

## Scoring

Responses to the 10 items on the orientation test and six subtests are scored as follows: 0 = *no response*; 1 = *attempts response, but error*; 2 = *partially correct or correct after reinstruction*; 3 = *self-corrected response*; 4 = *correct response after delay*; 5 = *correct, prompt response*. The 10 scores for each subtest are summed to provide a subtest score (maximum = 50). The subtest scores are summed to compute an overall score for the test (maximum = 350).

## Pilot Study

### Participants

Thirty-eight adults with aphasia resulting from a left-hemisphere stroke and 31 NBD adults were tested with the KAT. Table 1 summarizes demographic information for the groups regarding gender, age, education, ethnicity, and time postonset for the participants with aphasia. Analyses of variance (ANOVAs) were performed to determine whether participants with and without aphasia differed in age and years of education completed. Results indicated that participant groups did not differ significantly for age,  $F(1, 67) = 0.39$ ,  $p = .53$ , or years of education completed,  $F(1, 67) = 3.26$ ,  $p = .08$ .

Of the 38 adults with aphasia, 20, 10, and 8 participants were administered KAT-1, KAT-2, and KAT-3, respectively. ANOVAs were performed to compare the three groups of participants with aphasia; they did not differ significantly for age,  $F(2, 35) = 0.59$ ,  $p = .56$ , or years of education completed,  $F(2, 35) = 1.42$ ,  $p = .26$ .

**TABLE 1. Demographic information for participants with aphasia (PWA) and without aphasia (NBD).**

Variable	PWA (N = 38)	NBD (N = 31)
Gender	19M/19F	19M/12F
Ethnicity		
Caucasian	31	21
African American	3	10
Hispanic	1	0
Other	3	0
Age		
M (SD)	65.11 (14.42)	63.06 (12.29)
Range	32–87	50–86
Years of education completed		
M (SD)	13.00 (2.63)	13.76 (2.51)
Range	8–20	8–18
Months postonset		
M (SD)	59.97 (57.71)	
Range	3–240	

## Procedure

The NBD participants attended one session. Initial testing and activities were completed first; then all three versions of the KAT were administered. Initial activities included obtaining informed consent and collecting demographic information, as well as completing the Short Portable Mental Status Questionnaire (SPMSQ; Pfeiffer, 1975) to ensure normal cognitive functioning. All NBD participants had normal cognitive functioning based on their performance on the SPMSQ.

Participants with aphasia attended one or two sessions, depending on whether they completed the KAT a second time. After informed consent and demographic information were obtained, a narrative sample was collected from the participant's picture description and then analyzed to determine which KAT test battery the participant would receive. Following this determination, the orientation test was administered, and then the subtests of the appropriate KAT level were administered. Nineteen participants attended a second session and were administered the KAT a second time. This second session occurred no less than 1 week after the first session. Order of subtests administered was randomized across participants as well as testing sessions when applicable.

Test administrators were graduate students in speech-language pathology supervised and trained by certified speech-language pathologists. Testing took place in a quiet, distraction-free room. Participants' verbal responses were audiotaped. The examiner scored the KAT online for most items but was able to refer to the audiotapes to transcribe responses and score at a later time as needed. This was often necessary for the Repetition Span and Defining Words subtests. The audiotapes were also used to determine inter- and intrarater scoring agreement.

*Data analysis procedures.* Analyses of interest included how NBD participants compared across the three KAT batteries, how participants with aphasia compared across the different test batteries, and how participants with and without aphasia compared on the same KAT batteries. To determine whether NBD participants performed similarly across the three KAT versions, several repeated measures ANOVAs were performed. Several Kruskal–Wallis one-way ANOVA tests (a nonparametric test) were conducted to identify group differences among participants with aphasia. The Kruskal–Wallis was used for two reasons: (a) because of the unequal sample sizes among groups, and (b) because homogeneity of group variances was not met. Finally, equality of variance *F* tests were performed to determine homogeneity of variance for the group comparisons among participants with and without aphasia. Homogeneity of variance was not met for any comparisons; thus, Mann–Whitney *U* tests (a nonparametric test) were performed to compare KAT performances between participants with and without aphasia.

Reliability of the scoring system as well as overall test–retest reliability was determined. To ascertain scoring reliability, inter- and intrarater agreement for item-by-item scoring was calculated on responses from 20 of the participants with aphasia and 30 NBD participants for the Picture Naming, Repetition Span, and Yes/No subtests. The

Defining Words subtest required the examiner to make a judgment about the “correctness” (i.e., correct, partially correct, incorrect) of the individual's response in order to score each item. Since there was room for interpretation, these data were not collapsed with other scoring agreement data. Rather, all samples (i.e., aphasia and NBD) were included for interrater scoring judgments, and 50% of responses by NBD participants and 100% of responses by participants with aphasia were included for intrarater scoring judgments. Only these four subtests were included in determining scoring reliability because responses were verbal and could be scored from listening to the audiotapes.

Nineteen participants with aphasia completed the KAT twice, and their data were used to determine test–retest reliability. Pearson product–moment correlations were performed for each subtest as well as the total score between Session 1 and Session 2.

## Results

*Reliability.* For intra- and interrater scoring agreement, examiners listened to the audiotapes and scored test items no less than 2 weeks after the testing session. Scoring agreement data were collapsed for the three subtests—Picture Naming, Repetition Span, and Yes/No Questions. Inter- and intrarater scoring agreement was 85% and 94% for responses from participants with aphasia, respectively, and 93% and 98% for responses from the participants without brain damage, respectively. For the Defining Words subtest, examiners were trained to the rules for scoring and were provided a list of examples of correct definitions for the items prior to scoring. Item-by-item interrater agreement was 74% and 88% for responses from participants with and without aphasia, respectively. Item-by-item intrarater agreement for responses provided by NBD participants' samples yielded 94.7% agreement. Item-by-item intrarater agreement of the responses provided by participants with aphasia yielded 92.5% agreement.

Test–retest reliability for the KAT was determined for each subtest and the total score between Session 1 and Session 2. Pearson product–moment coefficients revealed significant correlations for all subtests ( $r \geq .80$ ,  $p < .0001$ ), demonstrating that participants' performance across sessions was stable. See Table 2 for groups' performance on the KAT subtests across the two sessions.

*Performance by NBD participants.* We expected that the NBD adults would perform at or near ceiling level for all subtests of KAT-1, KAT-2, and KAT-3, indicating that test items are appropriate and individuals without language problems are able to perform the tasks without difficulty. Also, we expected that performance would not differ for NBD participants across the different versions. Table 3 presents the subtest and overall means and standard deviations for the three versions of the KAT completed by the NBD participants.

Several repeated-measures ANOVAs were performed, and no significant differences were found among the three versions for the Following Commands, Repetition Span, Yes/No Questions, or Defining Words subtests. Participants evinced significant main effects for total score,  $F(2, 60) = 12.38$ ,

**TABLE 2. Means and standard deviations of test–retest performance for participants with aphasia for subtests and total score.**

Subtest	KAT-1 (N = 12)				KAT-2 (N = 4)				KAT-3 (N = 3)			
	Time 1		Time 2		Time 1		Time 2		Time 1		Time 2	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Orientation	22.9	13.8	23.0	13.3	36.8	10.8	38.0	9.1	31.0	21.0	34.7	22.4
Picture Naming	24.8	12.6	28.5	13.4	41.3	3.5	41.8	3.0	33.3	20.6	29.3	17.8
Commands	32.6	10.8	30.7	12.3	46.3	2.6	48.3	3.5	28.3	16.4	34.7	17.2
Repetition Span	34.0	18.4	33.2	16.3	43.5	11.1	44.0	8.1	30.0	17.6	32.3	20.1
Yes/No	34.3	12.7	36.4	10.7	41.5	6.0	42.5	6.4	40.7	6.1	43.3	9.0
Defining Words	28.2	13.3	30.8	13.3	26.5	13.0	26.5	12.6	31.0	19.0	32.3	19.4
Word-to-Picture	35.6	12.8	34.4	9.4	42.8	3.3	48.0	2.5	33.0	20.1	34.0	15.7
Total score	212.4	80.0	217.0	75.2	278.5	37.0	289.0	34.5	227.3	114.0	240.7	119.2

Note. Maximum total score for each subtest = 50; maximum total score overall = 350.

$p < .0001$ , and the Picture Naming,  $F(2, 60) = 38.55, p < .0001$ , and Word-to-Picture Matching,  $F(2, 60) = 22.75, p < .0001$ , subtests. Planned comparisons were performed to identify group differences. The a priori  $p$  value was set at .05. Multiple comparisons were performed; thus, we controlled for familywise error using an adjusted  $p$  of .0167. For the total score, participants yielded significantly better scores for the KAT-1 version compared with the KAT-2 and KAT-3 versions. Participants performed significantly worse on the KAT-2 version of the Picture Naming subtest compared with KAT-1 and KAT-3 versions. Lastly, for the Word-to-Picture Matching subtest, participants yielded the lowest score for the KAT-3 version compared with the KAT-1 and KAT-2 versions.

*Performance by participants with aphasia.* Thirty-eight participants with aphasia were administered the KAT at least one time. We anticipated no differences among the subtests or overall scores for the participants completing KAT-1, KAT-2, or KAT-3. The reason for this was that test items for KAT-1, KAT-2, and KAT-3 were selected so that those for KAT-1 would be less difficult than those of KAT-2 and so forth, to coincide with the parallel testing concept of the KAT. However, it was anticipated that participants with aphasia would differ in their performance on the orientation subtest. The reason for this was that the orientation subtest was the same for all participants, and better performance on

this test should be the case for less severe clients. Thus, participants completing KAT-3 would be expected to have the highest scores, those taking KAT-2 the next highest scores, and those taking KAT-1 the lowest scores. Table 4 shows the KAT subtest and overall means and standard deviations for the participants with aphasia. Several Kruskal–Wallis one-way ANOVA tests were conducted and revealed significant differences among groups on the orientation subtest ( $H = 8.55, p < .05$ ) and naming subtest ( $H = 7.87, p < .05$ ). Planned comparisons were performed, and the a priori  $p$  value was set at .05 and then controlled for familywise error. Results indicated that participants who completed the KAT-1 version performed significantly worse on the orientation subtest as well as the naming subtest compared with participants who completed KAT-2 and KAT-3 versions. No other comparisons yielded statistically significant differences.

*Comparing participants with and without aphasia.*

Mann–Whitney  $U$  tests were performed to compare KAT performances between participants with and without aphasia. See Table 4 for groups' performance on the KAT. Twenty participants with aphasia and 31 NBD adults completed the KAT-1 version. The groups differed significantly for all subtests as well as the total score ( $U = 618, p < .0001$ ). In all cases, the NBD group had significantly higher scores. Using an a priori  $p$  value of .05, similar results were found

**TABLE 3. Means and standard deviations for participants without aphasia (N = 31) on KAT-1, KAT-2, and KAT-3 subtests and overall.**

Subtest	KAT-1		KAT-2		KAT-3	
	M	SD	M	SD	M	SD
Picture Naming* KAT-2 < KAT-1 & KAT-3	48.5	3.3	42.3	5.8	48.0	4.1
Commands	49.9	0.4	49.4	1.8	48.6	2.2
Repetition Span	49.9	0.5	49.8	0.6	49.4	1.7
Yes/No	49.5	1.2	48.6	2.1	49.1	1.5
Defining Words	46.4	3.9	48.0	3.3	46.8	2.5
Word-to-Picture Matching* KAT-1 & KAT-2 > KAT-3	49.5	2.2	49.3	2.3	43.2	7.0
Total score* KAT-1 > KAT-2 & KAT-3	343.10	5.92	336.74	9.22	334.42	11.70

Note. Maximum total score for each subtest = 50; maximum total score overall = 350.

\*Statistically significant group differences.

**TABLE 4. Means and standard deviations for participants with aphasia and participants without aphasia for subtests and total score.**

Subtest	KAT-1				KAT-2				KAT-3			
	PWA ( <i>N</i> = 20)		NBD ( <i>N</i> = 31)		PWA ( <i>N</i> = 10)		NBD ( <i>N</i> = 31)		PWA ( <i>N</i> = 8)		NBD ( <i>N</i> = 31)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Orientation	25.1	12.5	49.4	1.3	36.6	7.8	49.4	1.3	37.9	13.0	49.4	1.3
Picture Naming	26.6	14.5	48.5	3.3	39.7	3.8	42.3	5.8	38.5	13.5	48.0	4.1
Commands	33.4	9.8	49.9	0.4	40.8	9.9	49.4	1.8	31.9	13.7	48.6	2.2
Repetition Span	34.5	17.4	49.9	0.5	43.7	10.3	49.8	0.6	34.9	15.8	49.4	1.7
Yes/No	36.6	10.5	49.5	1.2	38.9	8.8	48.6	2.1	41.9	6.6	49.1	1.5
Defining Words	29.4	12.7	46.4	3.9	30.4	10.5	48.0	3.3	35.1	13.8	46.8	2.5
Word-to-Picture	37.4	11.0	49.5	2.2	40.8	7.1	49.3	2.3	32.5	13.0	43.2	7.0
Total score	222.9	14.5	343.10	5.92	270.9	38.4	336.74	9.22	250.4	78.1	334.42	11.7

*Note.* Maximum total score for each subtest = 50; maximum total score overall = 350.

when comparing performances by the aphasia group (*N* = 10) who completed KAT-2 with the NBD group's (*N* = 31) KAT-2 scores, as well as comparisons between participants with aphasia (*N* = 8) and without aphasia (*N* = 31) on the KAT-3 version. That is, for all subtest and total score comparisons, the NBD group performed significantly better than the respective aphasia group.

Finally, test sensitivity for accurately differentiating adults with and without aphasia was determined. Using 1 *SD* of the NBD group's mean as an indicator of test sensitivity, we calculated the number of participants with aphasia who scored within this range. None of the participants with aphasia received total scores within 1 *SD* of the NBD group's means. However, for subtest scores within each KAT level, some participants with aphasia scored within 1 *SD* of the NBD group's mean. For KAT-1, 9% of scores by participants with aphasia across the subtests were within 1 *SD*; many occurred during the Repetition Span subtest (5 out of the 20 participants). For the KAT-2, 27% of scores by participants with aphasia were within 1 *SD*. However, most of these occurred during the naming subtest—8 of the 10 participants scored within 1 *SD*. Similar findings were found with KAT-3 scores: 29% of the scores by participants with aphasia were within 1 *SD*. The culprits of this number were the naming and Word-to-Picture Matching subtests. For each of these, 4 out of 8 participants scored within 1 *SD* of the NBD group's mean.

## Discussion and Clinical Implications

The KAT is a first step in the development of a measure for time-conscious clinicians in need of a single aphasia test with which to obtain an objective score for any client with aphasia. While the time to administer the KAT has not been determined empirically, our observations to date are that clients with aphasia need less than 30 min to complete the test. Although the KAT is not a diagnostic test, it appears to be capable of distinguishing among persons with and without aphasia. Test sensitivity refers to the probability of accurately detecting abnormal functioning in an impaired individual (Keil & Kaszniak, 2002; Lezak, Howieson, & Loring, 2004). Our NBD participants made few errors on the test and performed significantly better than PWA on all

measures. No PWA had an overall score within 1 *SD* of the NBD group. Thus the KAT is sensitive to aphasia when its overall score is used as a metric. However, as mentioned previously, 9%, 27%, and 29% of the participants with aphasia given KAT-1, KAT-2, and KAT-3, respectively, had orientation, expressive, or receptive subtest scores within 1 *SD* of the NBD group. Largely, this was a result of the fact that stimuli on the naming subtest of KAT-2 and the Word-to-Picture Matching subtest of KAT-3 were more difficult for the NBD participants than anticipated. Replacing these items with easier, less abstract stimuli may improve sensitivity of the KAT in the future, but this would be premature before increasing the database for the KAT, and it does not necessarily preclude use of the test at the present time. Also, Lezak and colleagues (2004) point out that judging the "goodness" of a test on its diagnostic accuracy is a questionable assumption because most tests have as their purpose describing an individual's strengths and weaknesses and monitoring the status of a disorder or disease for planning and treatment.

Preliminary estimates of scoring and temporal reliability for the KAT are relatively high. To administer the KAT, the clinician needs only a few materials (e.g., test booklet, scoring form, coins for making change, paper and pencil). Other props needed to administer the test (e.g., telephone) are usually available at the testing location. Perhaps the most compelling feature of the KAT is that it offers three separate tests in one clinical package: KAT-1, KAT-2, and KAT-3. The fact that the overall scores for participants with severe, moderate, and mild aphasia did not differ significantly for the three batteries suggests that we are close to establishing a reasonable hierarchy of difficulty for KAT-1, KAT-2, and KAT-3, and are creating different but parallel test protocols. This is confirmed, in part, by the fact that participants tested with KAT-1 performed significantly poorer on the only test that was the same for each battery, the orientation test, but unfortunately participants administered KAT-2 and KAT-3 did not differ on the orientation test.

### Potential Clinical Uses of the KAT

Managed care challenges clinicians to do more with less. For many clinicians, this means spending less time in

assessment and getting treatment started earlier. This has essentially been the case since the Budget Reconciliation Act of 1997. The fact that the “cap” for combined coverage of speech-language pathology and physical therapy services must be contested on a yearly basis suggests that the situation is not changing and clinician-friendly tests such as the KAT have a place in assessment.

The KAT has some shortcomings. Paramount is limited information about a client’s (a) functional abilities, (b) type of aphasia and/or co-occurring deficits, and (c) reading and writing. Some limited information on functional abilities can be obtained from the client’s responses to the orientation test; however, the KAT is predominantly an impairment-based measure. While aphasia research has shown that scores on impairment-based and functional tests are highly correlated (Holland, 1980; Irwin, Wertz, & Avent, 2002; Ross & Wertz, 1999), it is inadvisable to make determinations about how a client functions on test scores alone regardless of the type of test administered (Lezak et al., 2004). Information about the client’s language abilities will always rely heavily on (a) making careful behavioral observations (Holland, 1982), (b) carrying out informal assessment using items at the client’s bedside (Holland & Fridriksson, 2001; Marshall, 1997), and (c) having those familiar with the individual’s communicative status make indirect ratings with instruments such as the Communicative Effectiveness Index (Lomas et al., 1989).

Although the KAT has far fewer subtests than the two test batteries traditionally employed to specify type of aphasia—the BDAE and the WAB—it does contain some of the same subtests (Picture Description, Repetition, Naming, Word-to-Picture Matching, Following Commands, Yes/No Questions) that these longer batteries rely upon to designate type of aphasia. The primary strength of the KAT is that it is a “one-stop” aphasia test that can be rapidly administered to persons with severe, moderate, and mild aphasia at different points in the client’s poststroke course: acute care, rehabilitation, home health, and outpatient treatment. It is our hope that this initial step toward developing a clinician-friendly test will ultimately benefit clinic practice. We acknowledge that the KAT is in its early stages of development. Changes in test items, such as replacing stimuli in the naming and Word-to-Picture Matching subtests of KAT-2 and KAT-3, respectively, may need to be made in the future. It may also be necessary to remove one or two of the easier items from the orientation subtest and replace them with harder items to see whether the test will better differentiate those with severe, moderate, and mild aphasia. As pointed out previously, relying on clients’ performance on the picture description task to make decisions about severity may be unwise for some individuals. However, to make these changes before testing more individuals with and without aphasia with KAT-2 and KAT-3 would be throwing the baby out with the bath water.

Future research with the KAT needs to include (a) assessing more clients with aphasia with the KAT, (b) giving the test to clients with neurological deficits other than aphasia, (c) administering the test to clients in a wide variety of patient care settings, and (d) determining changes in clients’ language functioning with the KAT throughout the early post-onset course.

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**Appendix A (p. 1 of 3)****Orientation Subtest, Including Score Sheet and Stimulus Pictures**

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**Instructions to the examiner:** This should be the first subtest administered in the KAT battery. This subtest is the same for all levels. Accept as correct any response that clearly indicates that the patient has an understanding of the concept. **Instructions to the subject:** After introducing yourself to the patient say “*I am going to ask you to do some things you do everyday. Just do the best you can.*” Scoring: 0 = no response; 1 = attempt, but error; 2 = partially correct or correct after reinstruction; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item number	Materials needed	Examiner Prompt	Score
1. Dial 911	Telephone	You have an emergency and need to call the police. What do you do?	
2. Signature	Blank piece of paper with square to write name	Please write your full name in this box. Use back page of test booklet for recording response.	
3. Map direction	*Map of the United States with black dot in the center	Pretend you are standing here. Show me which way is South.	
4. Computation	*Milk =\$ 1.50 Eggs =\$ 1.80	Here are two things from the store. Add up your grocery bill. Use back page of this booklet for recording response.	
5. Phone number	Blank piece of paper with spaces for writing phone number	Write your phone number here. Use back page of this booklet for this response.	
6. Calendar	*Show the patient an 8 month calendar in the test kit	Here’s a calendar. Find May 17	
7. Telling time	*Pictures of four clock faces:	Which one says 2:10 PM?	
8. Making change	Hand patient 2 dimes, 2 nickles, 2 pennies	Show the patient a quarter: Make change for this!	
9. Look up phone #	*Show list of names	Show me the phone number for the Harris family on Spring Street	
10. Medication	*Picture of pill bottle. Directions say “Take one pill in the morning and one in the evening”	How many pills are you supposed to take each day?	

\*Item found in picture book  
Comments:

Score:

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**Appendix A (p. 2 of 3)**

Orientation Subtest, Including Score Sheet and Stimulus Pictures



Milk = \$ 1.50
Eggs = \$ 1.80

January						
M	T	W	Th	F	Sa	Su
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

February						
M	T	W	Th	F	Sa	Su
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

March						
M	T	W	Th	F	Sa	Su
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

April						
M	T	W	Th	F	Sa	Su
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

May						
M	T	W	Th	F	Sa	Su
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

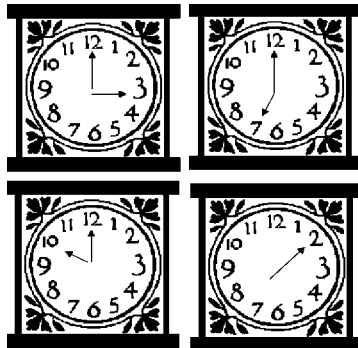
June						
M	T	W	Th	F	Sa	Su
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July						
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

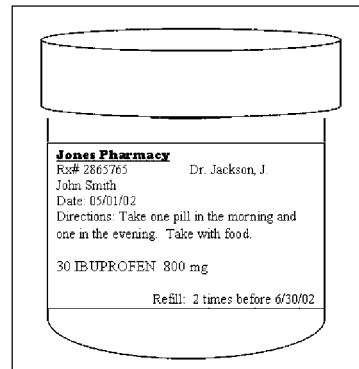
August						
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**Appendix A (p. 3 of 3)**

Orientation Subtest, Including Score Sheet and Stimulus Pictures



Garry, William	379 Main St.	555-9598
Gentry, Joseph	742 Bluejay Way	555-6590
Groves, Aaron	422 Tree St.	555-4626
Harris, Robert	211 Malibu Dr.	555-9575
Harris, Jason	144 Spring St.	555-9050
Houchens, Eric	62 Mill St.	555-3886
Horn, David	349 Hope Dr.	555-1332
Inge, Paul	622 Penny Ln.	555-5309



**Appendix B**

Content Units Produced by 63 Non-Brain-Damaged Adults in Response to the Divided Attention Picture Shown in Figure 1

Nouns		Verbs	Phrases
Announcer	Man	Sleeping	In the ceiling
Antlers	Moose	Changing (light bulb)	In the corner
Book	News	Crocheting	On her lap
Baseball cap	News reporter	Drinking	On the ground
Chair	Painting	Dropping	On the table
Couch	Paper	Getting shocked	On the wall
Desk	Picture	Laying down	
Dress	Radio	Looking down	
Drink	Room	Playing	
Flowers	Sofa	Reading	
Foot	Stool	Screwing	
Glass	Television show	Spill	
Hat	Towel	Standing	
Indian	Tug-o-war	Watching	
Jewelry	TV		
Lamp	Two dogs		
Living room	Vase		
Magazine	Woman		
Magnifying glass			

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**Appendix C (p. 1 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

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**Picture Naming**

**Instructions to examiner:** Accept as correct any naming response that is sufficiently intelligible to indicate the patient can name the picture. Do not penalize for minor articulation errors, struggle behavior, and distortions. **Instructions to subject:** *“Tell me the name of each picture I show you.”* Scoring: 0 = no response; 1 = attempt, but error; 2 = partially correct or correct after re-instruction; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item number	KAT-1	KAT-2	KAT-3	Score		
				L1	L2	L3
1.	Ball	Bear	Bagpipe			
2.	Car	Box	Barn			
3.	Horse	Desk	Basket			
4.	Square	Hat	Calf			
5.	Eye	Shoulder	Saddle			
6.	Bridge	Wheel	Tent			
7.	Key	Foot	Egg			
8.	Flower	Mantle	Icicle			
9.	Radio	Circle	Knee			
10.	Bed	Bag	Lock			

Comments:

Score:

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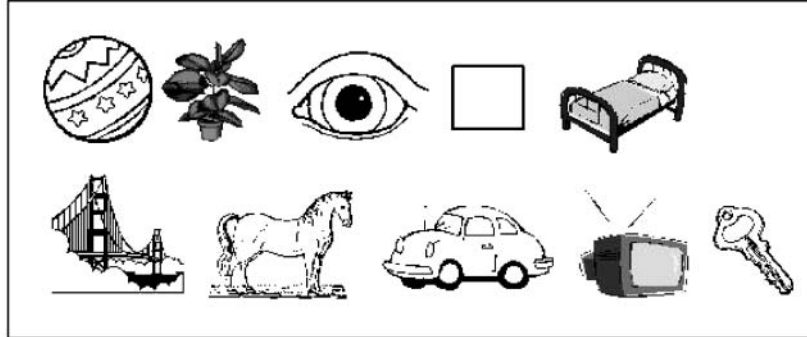
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**Appendix C (p. 2 of 8)**

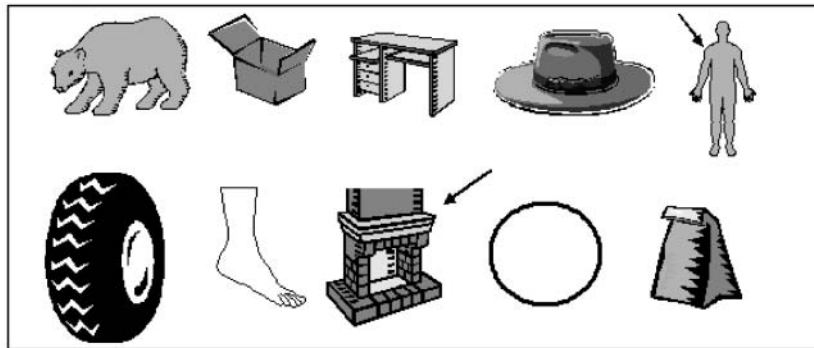
Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

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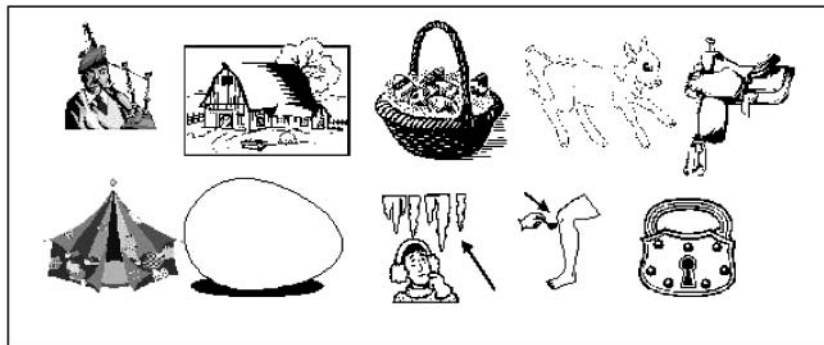
KAT-1 pictures:



KAT-2 pictures:



KAT-3 pictures:



**Appendix C (p. 3 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

**Following Commands**

**Instructions to examiner:** Make appropriate adjustment in right/left distinctions if the patient has a unilateral weakness would interfere with the performance of the command. **Instructions to patient:** “I am going to ask you do some things. Wait until I finish, then do exactly what I tell you to do.” Scoring: 0 = no response; 1 = attempt, but error; 2 = correct after re-instruction or partially correct; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item Number	KAT-1	KAT-2	KAT-3	Score		
				L1	L2	L3
Practice	Make a fist	Make a fist with your left hand	Touch your left ear with your right hand			
1.	Touch your knee and your elbow	Close your right eye	After you touch your right knee, raise your hand			
2.	Close your eyes	Put your hand on your left knee	Close your left eye with your right hand			
3.	Hold up two fingers	Raise your left hand	Before you raise your right hand point to your nose			
4.	Point to your eyebrow	Touch your nose with your left thumb	Touch your left elbow with your right hand			
5.	Stick out your tongue	Move your tongue to the right side of your mouth	Move your tongue from side to side after you close your eyes			
6.	Point to your foot and your nose	Clap your hands three times	Point to your left foot with your right hand			
7.	Show me a finger	Hold up your right index finger	Hold up your left index finger after you raise your hand			
8.	Touch your shoulder and your wrist	Put your finger in your ear	Touch your right shoulder with your left hand			
9.	Show me your ear	Touch your shoulder with your right hand	Put your hands together after you shut your eyes			
10.	Touch your thumb and your shoulder	Open your mouth real wide	Touch your right eyebrow with your left hand			

Comments:

Score:

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**Appendix C (p. 4 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

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**Defining Words**

**Instructions to the examiner:** Be sure that individuals being administered KAT-1 understand that they can use other modalities (e.g., gesture, pointing, drawing) to convey the meaning of the word. Present each word to be defined with instructions such as, e.g., "Tell me what "cup" means." **Instructions to subject:** "I am going to ask you to tell me what some words mean. For example, if I ask you what "money" means, you could say "It's something to spend" or you could even show me like this [here make a money gesture; for KAT-1 only]. You can do this in whatever way is best for you. Let's do one for practice. What does "fight" mean?" Scoring: 0 = no response; 1 = attempt, but error; 2 = partially correct; 3 correct after re-instruction; 4 = self-corrected response; 5 = correct.

Item Number	KAT-1	KAT-2	KAT-3	Pt's response	Score
Practice	Fight	Fight	Fight		
1.	Cup	Rose	Salmon		
2.	Hot	Cab	Hilarious		
3.	Large	Couple	Connect		
4.	Sleep	Journey	Complete		
5.	Throw	Thief	Beggar		
6.	Go	Carve	Companion		
7.	Baby	Prepare	Monument		
8.	Long	Rescue	Share		
9.	Smile	Ancient	Confidential		
10.	Push	Fake	Accelerate		

\*\*Refer to Table 2 for examples of acceptable definitions.

Comments: \_\_\_\_\_

Score: \_\_\_\_\_

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**Appendix C (p. 5 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

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**Repetition**

**Instructions to examiner:** Present the practice item before starting the repetition subtest.

**Instructions to subject:** *“I am going to say some numbers. I want you to repeat them exactly as I say them. Let’s try one for practice.”* Scoring: 0 = no response; 1 = attempt, but error; 2 = partially correct or correct after re-instruction; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item Number	KAT-1	KAT-2	KAT-3	Score		
				L1	L2	L3
Practice 1	Four	Thirty-seven	Three thousand, one hundred two			
1.	Seven	Three hundred nine	Four hundred seventy nine			
2.	Forty-three	Nine million thirteen	Sixty thousand one hundred four			
3.	Eleven	Two hundred thirty-six	Seven hundred, sixty-three thousand			
4.	Thirty	Eighty-two million	Twenty nine thousand, nineteen			
5.	Eight	Seventy seven	Two hundred eleven thousand			
6.	Fifty	Four hundred ninety five	One hundred seventy three			
7.	Three	Ten thousand fourteen	Eleven thousand twenty three			
8.	Eighty	Three hundred one	Two million, nine hundred fifty three			
9.	Ninety-two	Six thousand twenty eight	Forty seven hundred forty one			
10.	Eighty-six	One thousand, seventy two	Seventeen hundred thirteen			

Comments:

Score:

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**Appendix C (p. 6 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

**Yes/No Questions**

**Instructions to examiner:** Be sure of the manner in which the patient produces yes/no responses. **Instructions to patient:** "I am going to ask you some questions. Answer each question 'yes' or 'no.'" Scoring: 0 = no response; 1 = attempt, but error; 2 = correct after re-instruction; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item Number	KAT-1	KAT-2	KAT-3	Score		
				L1	L2	L3
Practice	Do dogs bark?	Do dogs chase cats?	Are dogs larger than horses?			
1.	Do cars move?	Do children drive cars?	Are cars faster than bicycles?			
2.	Do bears meow?	Do bears catch fish?	Do bears hibernate in summer?			
3.	Do robbers steal?	Do robbers catch police?	Do police always catch robbers?			
4.	Are boys males?	Do men become boys?	Are men larger than boys?			
5.	Are elephants large?	Do elephants have fins?	Are elephants smaller than horses?			
6.	Are you a doctor?	Do doctors work for nurses?	Do lawyers make decisions for judges?			
7.	Is water dry?	Is there water in a lake?	Does water flow under the dam?			
8.	Is Canada a country?	Is Canada south of the United States?	Does the best team always win the game?			
9.	Is money saved?	Do everyone save money?	Do misers spend their money?			
10.	Is six a flower?	Is five larger than six?	Is six half a dozen?			

Comments:

Score:

**Appendix C (p. 7 of 8)**

Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

**Word-Picture Matching**

**Instructions to examiner:** Turn the stimulus cards one at a time. For the practice item, instruct the patient with the verbal prompt, “point,” e.g., “Point to the fork.” Do not use the word point when giving the subtest itself, but **do use the word “point”** if the patient requests a repeat.

**Instructions to patient:** “I am going to ask you to point to one of five pictures shown on these cards. Wait until I finish before you point to the picture. Let’s practice one first.” Scoring: 0 = no response; 1 = attempt, but error; 2 = correct after re-instruction; 3 = self-corrected response; 4 = correct after a delay; 5 = correct and prompt.

Item	KAT-1	KAT-2	KAT-3	Score		
				L1	L2	L3
Practice	Book, house, hammer, <b>fork</b> , flower	Book, house, hammer, <b>fork</b> , flower	Book, house, hammer, <b>fork</b> , flower			
1.	Ball, <b>car</b> , dog, table, tree	Apple, orange, <b>banana</b> , pear, grapes	Diverging, converging, paralleling, <b>intersecting</b> , angling			
2.	Throw, drive, <b>run</b> , eat, chop	Mounting, peeking, melting, opening, <b>acting</b>	Convex, <b>sphere</b> , oval, rectangular, conical			
3.	Dog, car, ball, <b>table</b> , tree	Apple, orange, banana, <b>pear</b> , grapes	Diverging, <b>converging</b> , paralleling, intersecting, angling			
4.	Throw, drive, run, eat, <b>chop</b>	<b>Mounting</b> , peeking, melting, opening, acting	Convex, sphere, <b>oval</b> , rectangular, conical			
5.	Car, <b>tree</b> , table, dog, ball	Apple, orange, banana, pear, <b>grapes</b>	Diverging, converging, <b>paralleling</b> , intersecting, angling			
6.	<b>Throw</b> , drive, run, eat, chop	Mounting, peeking, melting, <b>opening</b> , acting	Convex, sphere, oval, <b>rectangular</b> , conical			
7.	Table, tree, car, <b>dog</b> , ball	Apple, <b>orange</b> , banana, pear, grapes	Diverging, converging, paralleling, intersecting, <b>angling</b>			
8.	Drive, <b>eat</b> , chop, throw, run	Mounting, <b>peeking</b> , melting, opening, acting	<b>Convex</b> , sphere, oval, rectangular, conical			
9.	Car, tree, <b>ball</b> , table, dog	<b>Apple</b> , orange, banana, pear, grapes	<b>Diverging</b> , converging, paralleling, intersecting, angling			
10.	Throw, <b>drive</b> , run, eat, chop	Mounting, peeking, <b>melting</b> , opening, acting	Convex, sphere, oval, rectangular, <b>conical</b>			

Comments:

Score:

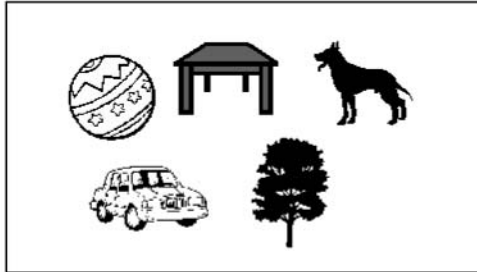
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**Appendix C (p. 8 of 8)**

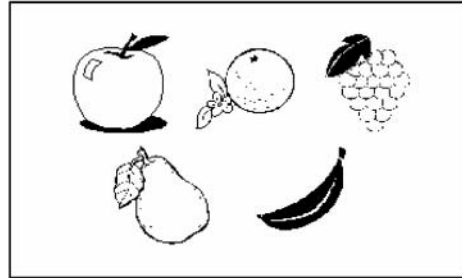
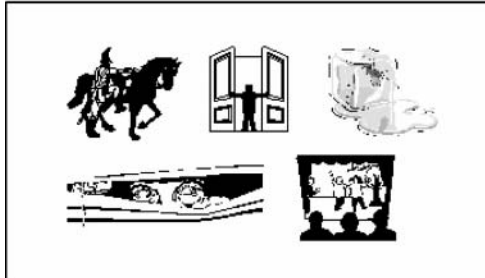
Score Sheets and Stimuli (When Applicable) for Picture Naming, Following Commands, Defining Words, Repetition Span, Yes/No, and Word-to-Picture Matching Subtests

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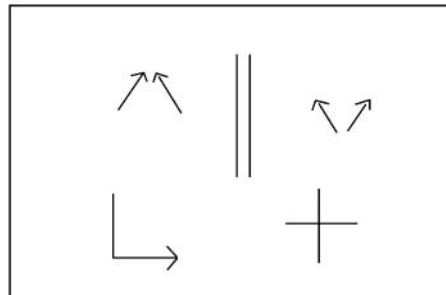
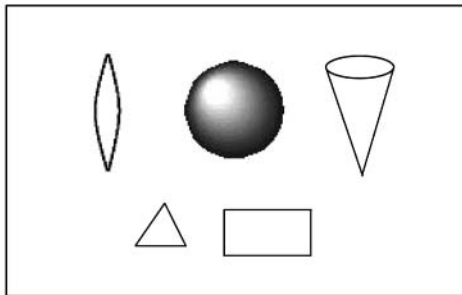
KAT-1 pictures for word-to-picture matching



KAT-2 pictures for word-to-picture matching



KAT-3 pictures for word-to-picture matching



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## Appendix D

### Acceptable Definitions for Items Used on the Defining Words Subtest

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#### KAT-1

*Cup*: Drinking utensil, holds liquid, liquid container, mug, holder/container  
*Hot*: Burn/burning, heated/with heat, matter of temperature, not cold, very warm  
*Large*: Big, not small, humungous, great, immense, large  
*Sleep*: Rest, quiet, go to bed, doze, not awake  
*Throw*: Pitch, toss, sling, thrust, launch an object  
*Go*: Move/motion, leave, get out, opposite of stop  
*Baby*: Infant, young child, new born  
*Long*: Measure of length, distance, not short, extended, lengthy duration  
*Smile*: Facial expression, happy, grin  
*Push*: Shove, move forward, opposite of pull

#### KAT-2

*Rose*: Flower, sweet smelling  
*Cab*: Taxi, paid/hired transportation, commercial transportation  
*Couple*: Two, two people together, pair  
*Journey*: Trip, travel  
*Thief*: Robber, criminal, crook  
*Carve*: Cut, slice  
*Prepare*: Get/make ready, to fix, plan  
*Rescue*: Save, help, retrieve from danger  
*Ancient*: Old, matter of age  
*Fake*: Not real, false, a lie, not true, phony, sham

#### KAT-3

*Salmon*: Fish, food  
*Hilarious*: Funny  
*Connect*: Put together, join, attach two items  
*Complete*: Finish, end, entire, whole  
*Beggar*: Poor man, someone who wants something, soliciting funds  
*Companion*: Friend, partner, loved one, associate, husband/wife  
*Monument*: Statue, memorial, landmark, structure that honors a hero  
*Share*: To give, divide with others, cut in half  
*Confidential*: Private, secret, personal, keep to oneself  
*Accelerate*: Speed up, go fast, increase speed, give more gas

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## **Developing a Clinician-Friendly Aphasia Test**

Robert C. Marshall, and Heather Harris Wright  
*Am J Speech Lang Pathol* 2007;16;295-315  
DOI: 10.1044/1058-0360(2007/035)

The references for this article include 6 HighWire-hosted articles which you can access for free at: <http://ajslp.asha.org/cgi/content/full/16/4/295#BIBL>

**This information is current as of September 14, 2012**

This article, along with updated information and services, is located on the World Wide Web at:  
<http://ajslp.asha.org/cgi/content/full/16/4/295>



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