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ABSTRACT
                The Kidtalk Interactive Diagnostic Test of Aptitude for
Language Knowledge (KIDTALK) is an assessment instrument designed for
identifying children with specific language impairments not associated with
limited English proficiency. It is based on three principles: (1) a language
disorder can be identified by testing an individual's potential for acquiring
linguistic features of a novel language; (2) language disorders can be
distinguished from language differences by developing test items that meet
two criteria (especially difficult for the language impaired while relatively
easy for non-language impaired and equally challenging for groups of children
with different cultural/linguistic backgrounds); and (3) language disorders
can be identified efficiently and easily using computer technology.
Development of the test in non-computerized form, then programming and
piloting of the software with several age groups are described, revisions are
chronicled, and validity results are reported. Plans for modifications are
also noted. (MSE)

The Creation and Validation of Kidtalk

THE CREATION AND VALIDATION OF KIDTALK

KIDTALK is a different approach to identifying specific language impairments in multicultural populations of children. Children with specific language impairments have extreme difficulty acquiring language even though they have perfectly normal abilities in the nonlinguistic areas of development. It is important to find a new method of identifying these children because currently used methods tend to be culturally and linguistically biased. The result has been the overrepresentation of minority students in special education, especially in the categories of Learning Disabled and Speech and Language Impaired. In other words, children with minority linguistic and cultural backgrounds are identified as language impaired when in fact they are not. They are just culturally and linguistically different.

KIDTALK stands for Kidtalk Interactive Diagnostic Test of Aptitude for Language Knowledge. I created it from a framework of three principles which might be effectively applied to all age/cultural/linguistic groups. The principles were derived from an extensive literature review. Principle 1 is that a language disorder can be identified by testing an individual's potential for acquiring linguistic features of a novel language. Test norms that employ this principle would be based on children's language learning aptitude rather than on their level of development in their native language or the language of the dominant culture. This means that the child's language development would not be compared unfairly with that of the mainstream population.

Principle 2 is that language disorders can be distinguished from language differences by developing test items that meet two criteria: (a) especially difficult for the language impaired while relatively easy for the non-language impaired, and (b) equally challenging for groups of children having different cultural/linguistic backgrounds. A literature review indicated that the first criterion might be met by exposing the child to a novel language through a story, in which words are auditorily embedded in an ongoing context. Thus, the test begins by having the child watch and listen to a story that is acted

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out by funny-looking creatures that talk to each other in an invented language called "Kidtalk." A review of the literature also suggested that children with language impairments have difficulty with comprehension of vocabulary, production of vocabulary and morphology, and repeating back auditory-verbal stimuli in the correct sequences. Thus, the test includes four subtests: Receptive Vocabulary (RV), Expressive Vocabulary (EV), Expressive Morphology (EM), and Auditory Sequential Memory (ASM). To meet the second criterion, the invented language, Kidtalk, is based on linguistic universals and typological similarities among languages. The meanings of the invented language forms were either universal, for example, food and drink (in Kidtalk, "buni" and "deni"); or novel meanings, for example, weird creatures that no one has seen before ("baba," "yeye," "kuku," "bibi").

Principle 3 is that <u>language disorders can be identified efficiently and easily through the utilization of computer technology</u>. Research indicates that computer applications are particularly suitable for measuring an individual's potential for learning. Numerous studies describe the positive effects of computers on young children's motivation and attention, and on the speed, accuracy, and ease of test administration and scoring. So, KIDTALK is designed to be administered and scored by computer.

Before putting the test on the computer, I trialed it in a noncomputerized form. I piloted this form of the test with elementary school-age children and I systematically modified it until an appropriate level of difficulty was obtained for each subtest. This process included nine piloted versions. I then took the ninth piloted version and programmed it for computerized administration and scoring. I did this using an authoring program called Authorware Professional. I recorded the story portions of the test on video. Children dressed in brightly-colored costumes acted out the story, speaking to each other in the Kidtalk language. The four subtests which followed the story utilized cartoon versions of those characters.

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I programmed the software so that through training and practice, the children would learn how to respond to test items. On practice items, if a child responded correctly, the computer automatically provided positive feedback (animated cartoons with sound effects). If the child responded incorrectly, the computer automatically provided neutral feedback (a large yellow triangle). I wrote the program so that responses would include touching a touch screen on the computer for comprehension items, and speaking to the computer through a microphone for production items. The computer automatically recorded the responses for the comprehension items. The examiner used the computer keyboard to record a 1 or a 0 for the production items. The computer automatically sent all scores to a separate student report.

Once the software program was written and ready, I piloted it to explore its effectiveness in identifying language impairment in two cultural and linguistic groups of children. I investigated two research questions. RQ1 was, "Is there a difference between the test scores of children who are language impaired and those who have normally developing language?" RQ2 was, "Is there a difference in test scores between the two culturally/linguistically different groups?" The participants consisted of 60 seven and eight year olds. Twenty-nine were Anglo/English-speaking (A/E) and 31 were Hispanic/ Spanish-speaking (H/S). In the A/E group, 18 were non-language impaired (NLI) and 11 were specific language impaired (SLI). In the H/S group, 21 were NLI and 10 were SLI. I administered KIDTALK to each child, and the average administration and scoring time was approximately 30 minutes per child. The following mean KIDTALK total scores were obtained:

Group		n	M	SD
Anglo/English		29	17.93	5.92
	SLI	11	12.36	3.64
	NLI	18	21.33	4.20
Hispanic/Spanish		31	18.90	6.25
	SLI	10	14.00	5.25
	NLI	21	21.24	5.34

These results show that the two groups in the two diagnostic categories differed, with the SLI children obtaining lower scores than the NLI children; while the two cultural/linguistic groups obtained similar scores.

A two-by-two factorial analysis of variance was computed for the KIDTALK total score. This yielded the following results:

Source	df	SS	MS	F
Diagnostic Category (A)	1	904.26	904.26	40.50*
Cultural/Linguistic Grp. (B)	1	3.92	3.92	.18
Interaction (A x B)	1	10.20	10.20	.46
Residual	56	1250.35	22.33	

$p < .0001$

These results indicate that the poorer performance of the SLI group was significant at the $p < .0001$ level. They also indicate that there was no significant difference in performance of the A/E and H/S groups, and no interaction effect, meaning that the lower performance of the children with SLI did not depend upon whether they were Anglo or Hispanic.

Conclusions of this preliminary study were that the validity of KIDTALK for identifying language impairments in culturally and linguistically diverse groups of children was supported. Implications were that because of its effectiveness with this sample, the KIDTALK approach may also be effective with other ages and linguistic and cultural groups of children.

Over the past year, with financial assistance from the University of Nebraska Committee on Research and the American Speech-Language-Hearing Association, I have been exploring the effectiveness of the KIDTALK method when applied to African-American/African-American-English-speaking, Anglo/Standard-English-speaking, and Hispanic/Spanish-speaking, 3 - 5 year olds.

Still keeping with the three theoretical principles, I modified the test in order to make it appropriate for speakers of the African American English (AAE) dialect, as well as for speakers of Standard American English (SAE) and Spanish. These modifications included changes to a few items to account for typological differences among AAE, SAE, and Spanish. For example, on the Expressive Morphology (EM) subtest, I changed a morphological rule denoting pluralization to a morphological rule denoting position.

I also made changes to accommodate the younger age group. For example, I increased the amount of animation and the number of modeled samples. On the RV subtest, I eliminated the more difficult words ("homa," "deni") and reduced the number of words tested (from 6 to 3: "yeye," "baba," "nini"). On the EM subtest, I made the morphological rule more perceptually salient (e.g., "nunu_wa_" instead of "_wa_nunu") and I eliminated the verb morphology section. I reduced the length of phrases in the ASM subtest so the longest had 6 syllables instead of 10 (e.g., "nataka kikapu"), and reduced the consonant blends to singletons. Finally, I simplified the video (i.e., shortened, removed three vocabulary words, added more repetitions of targeted vocabulary words, changed the characters to puppets, changed the background to solid black, and used fewer characters).

Currently, I am working on the fourth pilot of this AAE/SAE/S version of the test to determine its level of difficulty for 3 - 5 year olds. I've collected data from 23 children: 9 African American, 7 Anglo, and 7 Hispanic. I used item analyses to determine the difficulty level of the latest modification and the results revealed that the average level of item difficulty for the total test was 36% (note: the lower the percent level, the more difficult the item). The level of item difficulty for the RV subtest was calculated at 45%; the EV subtest at 3%, the EM subtest at 28%, and the ASM subtest at 71%. Because those items at the 50% level of difficulty make maximum discriminating power possible, these results indicate that the level of difficulty needs to be reduced on the EV and EM subtests.

Plans for systematic modifications include: (a) altering the video by making the characters and the meaning of the words they speak more clear and by reducing the number

of distracters in the story, (b) adding a section to the test that provides a review of the vocabulary items just before the EV subtest, and (c) adding a section to the test that teaches the children to comprehend the morphological form before testing the child's ability to produce it. Another possible revision is to reprogram the test to make it a computer adaptive test which measures the learning curve rather than just the final score. After I obtain the appropriate level of difficulty with this population, I will calculate item discriminating power, thereby determining KIDTALK's ability to accurately identify language disorders in preschoolers who represent the three different cultural and linguistic groups.

In conclusion, KIDTALK is still in the making, yet the results of the pilot research as I described today are encouraging. Through the continued development of this computerized language test and further exploration of its validity, it is possible that we will be able to make many steps in a new, significant direction toward nonbiased language assessment.

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