Assessing Different Aspects of Vocabulary Knowledge

Diane August and Lauren Artzi
Center for Applied Linguistics

Assessments that measure different aspects of vocabulary knowledge can meaningfully inform vocabulary instruction for English-language learners. Accordingly, we have developed a series of measures assessing different aspects of vocabulary knowledge including an assessment of students' knowledge of vocabulary that appears frequently in grade-level text (**Test of Academic Vocabulary in English**); an assessment of student's knowledge of high frequency multi-word units (**Test of Multiword Units**); an assessment of student's depth of knowledge of word meanings and word associations (**Word Associations Test of Academic Vocabulary**); an assessment of student's knowledge of the meanings of words that are homonyms (i.e., words that share the same spelling and the same pronunciation but have different meanings) (**Test of Homonym Knowledge**); and a measure that assesses student's knowledge related to conjunctions and discourse markers (**Test of Connectives**). All the measures were piloted in a series of cognitive labs before they were administered as part of larger research studies where validity and reliability data were obtained.

All of the measures utilized corpus-based techniques in order to identify words or phrases that are likely to appear in grade-level text and are thus meaningful for school-aged children to know in order to comprehend text they will encounter in school. The two corpora mainly utilized for these measures were the *Educator's Word Frequency Guide* (Zeno, Millard, Ivans, & Duuvari, 1995) and Dale and O'Rouke's (1981) *Living Word Vocabulary*. However, there are other corpora that teachers can use to draw upon when determining words to target for vocabulary instruction. Some corpora (see Table 1) show the age in which certain meanings of words are acquired while other coropora (see Table 2) show the frequency of word forms in written texts that children are likely to encounter. While many of these corpora are open access, others can be purchased for a nominal fee or acquired through a public library.

Table 1
Selected Corpora of Levels of Word Meanings

Name	Description
Living Word Vocabulary (LWV) (Dale & O'Rouke, 1981)	*The LWV* is a corpus of approximately 44,000 word meanings tested at different grade levels in a cloze format with three multiple choice items. A p-value or percentage of native English speakers who know the meanings of particular words at each grade level is shown for each word meaning in addition to the grade level for each meaning, grades 4-12.
Words Worth Teaching (Biemiller, 2006)	The *Words Worth Teaching* corpus shows meanings in terms of tiers of difficulty. The difficulty estimates are based on the LWV levels. A definition and sentence is provided with each meaning.

Table 2
Selected Corpora of Word Forms Frequent in Written Text

Name	Description
Educator's Word Frequency Guide (Zeno, Millard, Ivans, & Duuvari, 1995)	The *Educator's Word Frequency Guide* indicates the frequency of words that appear in written text in grades 1-13 in the United States. (Grade 13 is an indicator for college level texts.) Six thousand texts spanning kindergarten through college were used for the development of the corpus.
Academic Word List (Coxhead, 2000)	The *Academic Word List* consists of 570 word families which occur frequently over a range of (mainly expository) academic texts, at the secondary level, from different curriculum areas. This list does not include the most frequent 2,000 words of English and is not limited to text in the United States. You can find more information at http://www.victoria.ac.nz/lals/resources/academicwordlist/ and http://www.nottingham.ac.uk/~alzsh3/acvocab/.
Word Zones (Hiebert, 2005)	*Word Zones* is a corpus of zones of words in the *Educator's Word Frequency Guide* ordered in relation to frequency. You can find more information on the corpus at textproject.org.
The First 4,000 Words (Sales & Graves, 2009)	*The First 4,000 Words* consists of the most frequent words from The Educator's Word Frequency Guide (Zeno et al., 1995) and Word Zones (Hiebert, 2005). You can find more information at www.sewardreadingresources.com.
MRC Psycholinguistic Database (Wilson, 1988)	The *MRC Psycholinguistic Database* contains 150,837 words with linguistic attributes for each word. You can find more information at http://websites.psychology.uwa.edu.au/school/MRCDatabase/uwa_mrc.htm.

The following sections describe the item types used in each measure as well as implications for classrom teachers. While these assessments were designed for research purposes, classroom teachers can utilize similar task types in summative and formative ways in order to meaningfully inform instruction for their contexts.

Breadth of Word Knowledge

While current vocabulary measures assess how students compare with each other, most do not generate information that is meaningful for instructional purposes, notably how well students know vocabulary that appears frequently in grade-level text. The **Test of Academic Vocabulary in English (TAVE)** was designed to assess childrens' knowledge of high frequency academically important English vocabulary. Tests were developed at each grade level for grades 3-8. In order to identify academically important vocabulary words for different grade levels, a database of academic vocabulary was developed by combining information from the *Educator's Word Frequency Guide* (Zeno, Millard, Ivans, & Duuvari, 1995) and the *Living Word Vocabulary* (Dale & O'Rourke, 1981) into a single database and coding each word meaning for attributes that influence acquisition.

The TAVE assessment at each grade level consists of four mini-tests, each composed of three units. Each unit contains four items and a word bank with nine words, consisting of four target words and five distractors. Target words and distracters that make up each unit are morphologically and syntactically congruent. Participants are instructed to choose words from the word bank that match each item. Child-friendly definitions and cloze sentences have been developed for the selected words drawing on a variety of high quality dictionaries (e.g., *Wordsmyth Lexipedia*, Parks, Ray, & Bland,

1998[1]) for native-English-speaking children and English learners. The correct answer matches both the definition and completes the sentence. Each mini-test takes 15 minutes to complete (see Figure 1 for an example mini-test). Items are scored incorrect if the wrong word is chosen. Teachers can use this measure for instructional purposes to determine the types of high-frequency grade-level words their students have acquired.

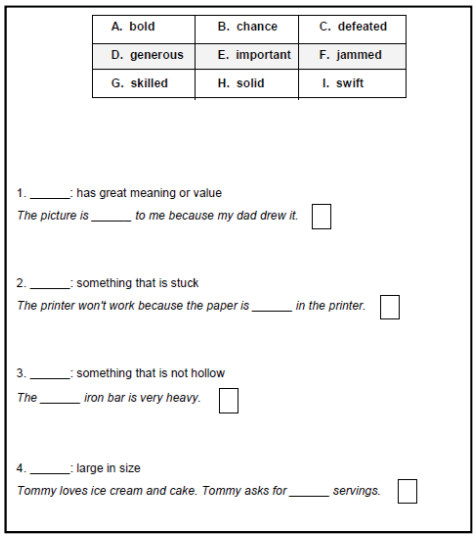

Figure 1. TAVE 7th grade mini-test.

Knowledge of Multiword Units

Recent research on vocabulary knowledge suggests that an individual's lexicon is not only composed of individual words, but also recurrent strings of words, or *multi-word units (MWUs)* (Biber, Conrad & Cortes, 2004; Nekrasova, 2009; Simpson-Vlach & Ellis, 2010). The 25 item **Assessment of Multiword Units** (MWU) was designed to assess children's knowledge of high utility multi-word units that appear frequently in grade-level text. For this asssessment, a total of 260 four-word multi-word units were identified from a corpus of written academic texts for fifth grade. The word strings were categorized by discourse function, and rated for linguistic importance and importance for teaching.

An item type similar to one developed by Revier (2009) was used as a basis for creating the items for this assessment because it was judged to be effective in measuring productive knowledge of collocations, which are similar in structure to MWUs (Shillaw, 2009). In this item type, a cloze sentence in which the MWU fits is presented with a word bank below each possible word in the string (see Figure 2). While Revier (2009) utilized an all or nothing scoring procedure where the item was judged correct only if all components of the word string were answered correctly, other scoring methods, such as partial credit, are being explored in relation to this item type. Classroom teachers can determine their own scoring procedures and utilize information from this item type to determine which multiword units are challenging.

[1] You can find more information at: http://www.wordsmyth.net/.

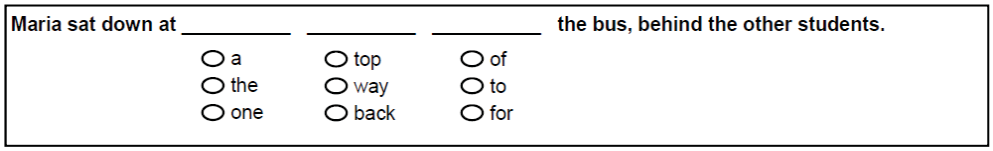

Figure 2. Example item from Multiword Units assessment.

Depth of Word Knowledge

Though depth of word knowledge has been shown to be as important as breadth of word knowledge in reading performance and comprehension (Shen, 2008), few assessments have been developed that distinguish depth from breadth or measure depth in school-age English-language learners (Schmitt, Ng, & Garras, 2011). The ten-item **Word Associations Test of Academic Vocabulary in English** was designed to assess children's knowledge of hierarchical lexical associations of high frequency English vocabulary, controlling for type of association. In order to generalize back to a meaningful corpus, the words were drawn from the *Educator's Word Frequency Guide.* The measure consists of five items that are nouns and five verbs.

Drawing on the format used in Schoonen and Verhallen (2008), each item consists of a central word that is surrounded by six possible answers. Three of the six possible answers are correct associations and three are considered incorrect associations. Each correct association represents one of three possible hierarchical lexical relationships: a subordinate relationship (e.g., banana), a superordinate relationship (e.g., fruit), and a synonymous relationship (e.g., happy, glad). The three incorrect associations are words that can appear in sentences that use the central word but they are not inherently related to the central word. Children are prompted to draw a line to the three words that are associated with the central word irrespective of context (see Figure 3).

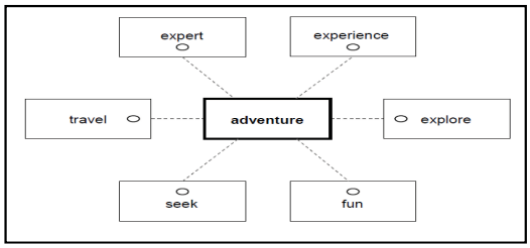

Figure 3. Example item from the Word Associations Test of Academic Vocabulary in English

Different scoring procedures were investigated and an all or nothing procedure was determined to be the most suitable; however, classroom teachers can analyze partially correct items in order to determine the kinds of lexical relationships students are having difficulty acquiring.

Homonym Knowledge

English-language learners may have difficulty with English vocabulary because many English words sound and look alike but have different meanings or are homonyms. The ten-item **Test of Homonym Knowledge** (THK) is designed to assess children's knowledge of the multiple meanings of homonyms. In order to generalize to a meaningful corpus, words were drawn from the *Educator's Word Frequency Guide* and the correct meanings for each word were chosen from the *Living Word Vocabulary* database.

Each item includes a single word and six possible definitions for the word, including three correct meanings and three incorrect meanings (see Figure 4). The meanings chosen for each item are on a graded scale where one of the meanings is likely known by grade 4, according to the *Living Word Vocabulary*; one meaning likely known at grade 6; and one meaning likely known at grade 8. Scoring procedures are still being investigated.

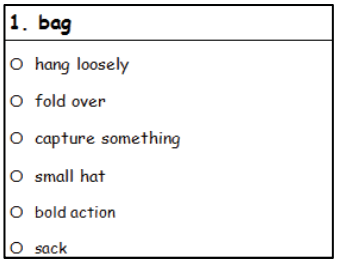

Figure 4. Example item from Test of Homonym Knowledge

Knowledge of Connectives

English-language learners in fourth grade have been found to have substantially greater difficulty than their English proficient peers when it comes to comprehension of discourse markers of coherence relations (Crosson, Lesaux, & Martiniello, 2008). Often called "connectives," these words include conjunctions and selected adverbs, and are considered essential for comprehending connected text. The 22 item **Test of Connectives** (TOC) is designed to measure students' knowledge of conjunctions and discourse markers. In designing this measure we used the Text Cohesion Task (TCT) developed by Droop & Verhoeven (2003) as a starting point. An English version of the task has recently been used in a study by Crosson (2005). Following the criteria outlined in Crosson (2005) we selected one class of coherence relations for each item with classes consisting of contrastive, additive, causal, adversative, and temporal and matched target words to distractors based on level in the *Living Word Vocabulary*.

The task uses a multiple choice cloze procedure to test for understanding of discourse markers at the sentence or clause level (see Figure 5). Classroom teachers can utilize this item type when assessing children's knowledge of the different kinds of discourse markers in order to determine the kinds of connectives students are having difficulty acquiring.

Last week I had to go to the hospital _____ I stepped on a piece of broken glass.
a. while
b. but
c. because
d. therefore

Figure 5. Example Test of Connectives item.

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