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LLED 5730E Spring 2022

17 February 2016

### **Emma's Wug Test**

The Wug Test is one of the most famous experiments across the school of linguistics, for its insights into how young English speakers acquire the ability to produce new word forms using inflectional and derivational morphology. Jean Berko designed the 'Wug Test' in the late 1950's, and in 1958 published the paper *The Child's Learning Of English Morphology* to disseminate the findings of his experiment. In the 'Wug Test', the interviewer gives the subject a made-up noun or verb, and asks the subject to use it in a grammatical situation which would change its morphology. Berko describes the importance of using invented nonsense words as follows:

“To test for knowledge of morphological rules, we use nonsense materials. We know that if the subject can supply the correct plural ending, for instance, to a noun we have made up, he has internalized a working system of the plural allomorphs in English, and is able to generalize to new cases and select the right form.” (Berko, 1958)

In order to select for morphemes to test for, Berko collected the 1,000 most commonly used words of first-graders, and analyzed the inflectional morphology which the children would apply to them. He found evidence of verb inflection, plural noun inflection, and adjective

comparative/superlative inflection. Since its introduction, the Wug Test has become a common test given to English speakers to demonstrate morpheme productivity.

In the following paper, we will analyze the responses of Emma, a seven year old girl, as she is given the Wug Test interview. In terms of Emma’s background information regarding language, she engages in conversation very frequently with her extended family, and new people. Although Emma’s mother says that Emma finds reading boring, her second-grade teacher says that she reads very well for her age. She also uses text messages, an iPad, and Instagram to communicate.

The smallest parts of words which contain lexical meaning are morphemes. Free morphemes can exist as a word independently, whereas bound morphemes must be attached to one or more other morphemes (Hoff, p226). When the constituent morphemes of a word are changed due to grammatical rules, but the lexical meaning stays the same, this is known as inflection, or inflectional morphology. One example of inflection in English is the addition of the morpheme /s/ to create the plural form for many words. This /s/ morpheme is the target of the first section of the ‘Wug Test’ interview given to Emma.

The plural morpheme /s/ in English has three main allomorphs, which are phonetic variations of a morpheme with the same lexical meaning. The three allomorphs are shown below.

English Orthography		IPA	
(SG)	(PL)	(SG)	(PL)

/z/	wug	wugs	/wʌg/	/wʌgz/
/ɪz/	glutch	glutches	/glʌtʃ/	/glʌtʃɪz/
/s/	quirk	quirks	/kwɜːk/	/kwɜːks/

The plural in English is commonly formed by suffixing the allomorphs /z/, /ɪz/, or /s/. The specific allomorph a speaker needs to use is dictated by the phonotactics of English. For example, if a word ends in a vowel or voiced consonant, such as /g/, they add the /z/ morpheme. If a word ends in a sibilant fricative or affricate, such as /tʃ/, the speaker adds /ɪz/. If the last consonant of a word is voiceless, such as /k/, the speaker adds /s/.

In this ‘Wug Test’ interview, Emma shows a good understanding of the inflectional plural allomorphs. When asked to provide the plural for the made-up word ‘wug’, she correctly produces /wʌgz/. Emma also produces /glʌtʃɪz/ (‘glutches’) as the plural for /glʌtʃ/ (‘glutch’). According to Jean Berko Gleason, children as young as four have the ability to produce ‘wugs’ as the hypothetical plural of ‘wug’ (qtd. in Hoff, 251). Despite her proficiency, Emma does make one suboptimal use of the /s/ allomorphs, when producing the plural of the made-up word ‘Heaf’.

In English, if a noun ends in the voiceless fricative /f/, it is usually voiced to become a /v/ before the plural allomorph of /s/ is added. Some examples are shown below.

English Orthography		IPA	
(SG)	(PL)	(SG)	(PL)
knife	knives	/nʌɪf/	/nʌɪvz/
leaf	leaves	/li:f/	/li:vz/
wife	wives	/waɪf/	/waɪvz/
half	halves	/hʌf/	/hʌvz/

When Emma is prompted to form the plural of ‘Heaf’, she produces /hifs/ instead of /hivz/. This is not very surprising, since the /f/ to /v/ rule does not always apply, and is rarer than other plural formations.

According to Sid Kouider , Justin Halberda , Justin Wood & Susan Carey, the singular/plural distinction is generally acquired just before the second birthday (2009). Additionally, they found that infants are more likely to comprehend plurality if a sentence contains redundant inflections, such as plural verb and noun inflection. If a sentence only contained plural noun inflection, the infant was less likely to recognize it. The team conducted this research using looking-time analysis and sentences containing plural/singular morphological elements.

The Wug Test also gives examples of made-up ‘nonsense’ verbs, for interviewees to apply inflectional morphology to. Although English verbs can have irregular morphology, regular verb morphology is productive, and can be used to generate new word forms. In the Wug Test, the interviewer attempts to elicit the various verbal suffixes. During the interview, Emma seems to have a solid grasp of verbal inflection. When conjugating the nonsense verb ‘naz’, she correctly applies the third-person singular affix to produce /nazɪz/ (‘nazzes’). Emma also uses the past tense verbal affix to produce the form /bɪŋd/ (‘binged’) from /bɪŋ/ (‘bing’). Lastly, Emma produced the word /zɪbɪŋ/ (‘zibbing’) from /zɪb/ (‘zib’) by adding the progressive affix in the appropriate context.

Although Emma was very proficient in inflecting English verbs, her morphological productions had an irregularity. The interviewer included some words which were real English verbs, such as the verb ‘to ring’. ‘Ring’ is an irregular verb in English, with the past tense form ‘rang’. Emma produces the incorrect form ‘ringed’ due to overregularization of the inflection rules for English verbs. Irregular forms take longer to acquire in language, because a speaker must commit each individual word form to their mental lexicon, instead of a more general morphological grammar rule. Research suggests that not all morphological processes are acquired by children at the same rate. According to Roger Brown:

“Different morphemes first appear at different times, and a long period of time passes between the first time a morpheme is used and the time it is reliably used in contexts where it is obligatory.” (qtd. in Hoff 235)

Below is a chart comparing the development of the plural noun suffix and progressive verb suffix in one child’s speech, created by Erika Hoff, and derived from work published by Brown.

(Hoff, 2009, p235)

According to the above chart, infants acquire the ability to produce the plural morpheme at a faster rate than the present progressive morpheme.

Another form of inflectional morphology in English is the formation of comparative and superlative forms of adjectives in English. When given the term ‘quirky’, Emma correctly forms ‘quirkier’ as the comparative form, and ‘quirkiest’ as the superlative form. According to Berko, although children may begin using the comparative and superlative suffixes around first grade, they do not reliably begin producing them until later in development. Therefore, it is impressive that Emma produced these suffixed adjective forms successfully during her interview, and may be caused by her extensive language use with extended family or high reading level.

The suffix ‘-let’ is often added to English words to create a diminutive form of a noun, as shown in a few examples below.

English Orthography		IPA	
Root	Diminutive	Root	Diminutive
book	booklet	/bʌk/	/bʌklɪt/
pig	piglet	/pɪg/	/pɪglɪt/
drop	drop	/dɹɒp/	/dɹɒplɪt/

This diminutive ‘-let’ suffix cannot be applied regularly and is somewhat uncommon. When the interviewer attempts to elicit the diminutive morpheme, Emma instead produces the phrase ‘a small wug.’ The morpheme’s rarity likely affected Emma’s ability to produce it. Additionally, the suffix ‘-let’ is unusual for another reason. According to Andrea Tyler and William Nagy, the most common derivational suffixes in English serve to change the part of speech of the resulting word (1989). The diminutive suffix does not hold to this general pattern, and so the lexical meaning of the affixed word is further removed from the lexical meaning of the base word. Tyler and Nagy claim that by fourth grade, most English speakers have a solid grasp of English morphemes. Therefore, since Emma is a second grade student, it makes sense that she is not yet able to consistently produce the less-common diminutive ‘-let’ morpheme. In contrast, adults given the ‘Wug Test’ have no trouble producing diminutive forms such as ‘wuglet’.

In English, compounding is the process of combining two or more root words together to form a new word. One question in the ‘Wug Test’ is designed to elicit compounded words. When the interviewer asks for the name of a house that a ‘wug’ lives in, the ideal response would be a ‘wughouse’, following the pattern of birdhouse, doghouse, and lighthouse. Instead, Emma produces ‘a nest’, likely because the picture of a ‘wug’ somewhat resembles a bird. Interestingly, according to Jeremy Anglin (Anglin, 1993), at the second grade mark a child’s vocabulary is roughly evenly divided between root words, inflected words, derived words, and literal compounds. Hoff generated the following chart based on Anglin’s data-

(Hoff, 2009, p336)

Compounding is a very natural way for L1 speakers to generate words, and speakers begin to make up compound words as young as 2 or 3 to fill in for a word they have not acquired yet (Anglin, 1993).

In conclusion, I would say that Emma's responses in the 'Wug Test' interview demonstrate average to above average morphological development for a second grade L1 English speaker. She correctly produces verbal tense inflection, plural noun inflection, and even comparative/superlative inflection. Emma did not provide examples of compounding or diminutive affixation, but I would expect that she develops these forms by fourth grade, in accordance with Tyler and Nagy's predictions about the development of English derivation morphology (Tyler & Nagy, 1989). Since its birth in 1958, the 'Wug Test' has remained a staple process for eliciting morphological development of L1 English speakers.

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