

# Morphological Awareness Strategies for the General and Special Education Classroom

## A Vehicle for Vocabulary Enhancement

by Susan M. Ebbers

In the English language, morphemes primarily include prefixes and suffixes (collectively called *affixes*), as well as bases and roots. Imprecisely referred to as “word parts” in some school curricula, the primary function of morphemes is to convey meaning. Words containing more than one morpheme are considered to be *morphologically complex*. Because the formation of morphologically complex words is based primarily on meaning-bearing morphemes, studying morphology is virtually inseparable from studying vocabulary. The utility and salience of this construct led researchers Nagy and Scott (2000) to assert: “It is hard to overstate the importance of morphology in vocabulary growth” (p. 275). Therefore, the purpose of this article is to focus on how general educators and specialists, such as reading interventionists, might use morphological awareness—which includes explicit declarative knowledge of prefixes, roots, and suffixes—as a vehicle for developing vocabulary.

The linguistic term “morphology” is not found in the Common Core State Standards, but nonetheless the construct is present in the document from kindergarten to 12<sup>th</sup> grade, within the domains of reading, writing, and vocabulary development. By third grade, students are already expected to “Identify and know the meaning of the most common prefixes and derivational suffixes”—no simple task, for numerous common prefixes exist in the English language, including *sub-*, *tri-*, and *pre-*, as well as several dozen derivational suffixes that affect word meaning and grammatical function, including *-ly*, *-ist*, and *-ive*. Fourth-grade graduates are expected to “Use common, grade appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., *telegraph*, *photograph*, *autograph*).” Underpinning this K–12 focus on morphology is the integration of context clues with morphemic clues, augmented by the dictionary, as expressed in College and Career Readiness Anchor Standard 4: “Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate” (Authors, 2010). Although these standards define learning expectations and milestones per grade level, they do not elaborate on the process for achieving these goals. This paper addresses that question to some extent.

### Language Development and Morphological Awareness

Morphological processing often occurs beneath the surface, at an apparently inborn, subconscious level, having tremendous bearing on the natural human ability to gradually develop language, including an expansive vocabulary, and the ability to construct coherent sentences (Baayen & Schreuder, 2003; Clark, 2009; Pinker, 1999). The development of morphological processing, along with the development of vocabulary, is a

gradual process that begins early. Thus, a 3-year-old recently combined *beneath* and *near*, saying, “You drew the cat *\*benear* the bunny!” and a hopeful 4-year-old asked if the rock candy her daddy was stirring was *\*rockening* yet (personal conversations).

Due largely to innate morphological processing, typically developing children increasingly gain familiarity with a variety of word structures, including basic words (e.g., *web*), inflections (*webs*), compounds (*webmaster*, *cobweb*), derivations (*weblike*, *webby*), linguistic blends (*web* + *seminar* > *webinar*), and clips (*weblog* - *we* > *blog*). Children also learn to use a known word for a different grammatical function (for example, *web* the noun becomes *web*, the verb). All the morphological structures described above, and more, appear in the array of words found in the English lexicon.

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Teaching vocabulary through morphology can be interesting and rewarding. Moreover, the groundwork has been established since birth. Teachers can exploit the natural but subconscious waters of morphological processing by drawing it up to the surface of the mind. They can provide lessons that promote keen levels of conscious morphological knowledge and insight, a type of metalinguistic insight called *morphological awareness* (Carlisle, 2010; Deacon, Campbell, Tamminga, & Kirby, 2010; Kuo & Anderson, 2006; Nagy, 2007). Morphological awareness has been defined as “awareness of and access to the meaning and structure of morphemes in relation to words” (McBride-Chang, Wagner, Muse, Chow, & Shu, 2005, p. 417). This construct includes various types of knowledge, and is considered to be a kind of metacognition. Morphological awareness develops over time, especially if instruction is provided, and helps explain differences in literacy, including vocabulary knowledge (Anglin, 1993; Berninger, Abbott, Nagy, & Carlisle, 2010; Bowers, Kirby, & Deacon, 2010; Carlisle, 2010; Kirby et al., 2012; McBride-Chang et al., 2005).

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Through natural, implicit morphological processing, children gradually produce and comprehend words of increasing complexity. However, with instruction in morphology, implicit knowledge becomes more explicit, declarative, metacognitive, and far more useful. With declarative knowledge, the student can state that the prefix *trans-* denotes ‘across’ but the prefix *circum-* denotes ‘around’—and then put this knowledge to good use when reading, writing, speaking, and listening.

Nagy claimed that “Vocabulary instruction needs to be more explicitly metalinguistic” (2006, p. 54), describing a tantalizing link between metalinguistic insight—including morphological awareness—and comprehension, even beyond the effect on vocabulary growth. Teachers facilitate metacognition, including morphological awareness, in a language-rich learning environment, where learners reflect upon, discuss and debate the meanings of morphologically complex words, with teacher feedback. Collaboratively they manipulate morphemes, as in sorting activities. Teachers and learners use books and other media as a vehicle for morphological discovery, and the “ah-ha” moment is celebrated when context clues and morpheme clues combine to inspire an educated guess or inference about word meaning (see Baumann, Ware, & Edwards, 2007; Baumann et al., 2012).

### Motivation and Morphological Problem Solving

There are endless opportunities to encounter morphologically complex words in school. They abound in the English language, and can confound the struggling reader. Fortunately, words with multiple morphemes tend to mean what they say, with some exceptions. A *tri-angle* indeed has three angles, three corners. A *ring-tailed raccoon* has rings around its tail. And an *un-predict-able* ending catches us by surprise.

On the other hand, a person who feels *restive* does not relax and a *unicorn* does not have one corn. Not every morphologically complex word is formed with affixes surrounding a familiar base word, as seen in *overexcited*, for example, but such words are the most easily interpreted (Anglin, 1993; Bowers et al., 2010). With instruction, students will learn the limitations of morphological reasoning, and will learn to use context clues to support morphemic analysis. When they eventually learn Greek and Latin roots, they might realize that *corn* is Latin for ‘horn’ and grasp the elusive *unicorn*.

But students must also learn to occasionally accept frustration. They must be told that sometimes the combined analysis of morpheme clues and context clues to infer word meaning yields little or nothing. This is not their fault. Some morphemes are rare. In some words, the morphemic meanings are fuzzy and opaque. Moreover, researchers have found that clearly pointed context clues occur only infrequently in passages, about 10–25% of the time (Swanborn & de Glopper, 1999; Nagy, Anderson, & Herman, 1987). Examining various school texts, Nagy and Anderson concluded that morpheme clues and context clues are accessible to the average sixth-grade student about half the time, for the purpose of inferring word meaning (1984). The inference strategy fails when context clues and

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Constant frustration erodes motivation, especially the learner’s appraisal of self-efficacy. Perceived self-efficacy describes the degree to which we feel able to cope with a particular type of task (Bandura, 1997). It is not the same as a generalized sense of self-confidence. In this case, self-efficacy applies to students striving to infer word meaning from morpheme and/or context clues. Bandura found that self-efficacy grows from successful encounters with the specific task, and that too much frustration and repeated failure, especially during initial attempts, inhibits self-efficacy. Then the student gives up. Motivation matters when approaching a complex task. As Carlisle (2007) noted, “It is only when students believe they know how to analyze unfamiliar words in texts that they will expend the energy to become close readers” (p. 99).

Similarly, the psychological state of absorbed interest is another motivational force, one that simultaneously energizes emotions and intellect. Hidi and Ainley (2008) discussed how children and adults manifest a close relationship between self-efficacy for a given task and interest in the task—or the lack thereof. Emotion psychologist Paul Silvia (2003, 2008) demonstrated repeatedly that we tend to walk away from a task we believe is too difficult (or too easy). He argued that interest is related to self-appraisal of ability, similar to self-efficacy. Moreover, he dubbed interest “the curious emotion” and classifies it within a knowledge-class of emotions, along with wonder, surprise, and fascination.

The English lexicon is a marvelous precision tool, and potentially a fascinating puzzle, but learning to use it at an advanced level can present a severe challenge. For all learners, at all ages, motivation is key. As Graves (2006) said, “Kindling students’ interest and engagement with words is a vital part of helping all students, but especially less advantaged students, to develop rich and powerful vocabularies” (p. 120).

### Affixation and Compounding

English word formation is frequently based on a morphological process called affixation: the attachment of prefixes and/or suffixes to bases or roots (for example, *en-joy-able*, *bene-fact-or*). The process of affixation results in morphologically complex derivations, such as *exothermic* and *nondiscriminatory*, ubiquitous to science and social studies texts (Butler, Bailey,



Stevens, Huang, & Lord, 2004). When affixes are added to a root or base, a simple inflection or a more complex derivation is formed, and with instruction, even first graders can understand this process (Apel & Diehm, 2014). Students also need to eventually understand that attaching derivational suffixes to a word often results in a different grammatical word class. For instance, *boy*, the concrete noun, becomes *boyish*, the adjective, when the derivational suffix *-ish* is added. Then it becomes *boyishly*, the adverb, when the derivational suffix *-ly* is added. With the derivational suffix *-hood*, it becomes an abstract noun, *boyhood*.

Affixing suffixes frequently results in a confusing shift in phonology and/or orthography. For instance, this shift occurs when *provide* becomes *provisions*. The sound and spelling of the original base *provide* is tweaked, transparency is lost, and the morphological relationship is obscured, simultaneously obscuring the semantic connection between *provide* and *provisions*. Phonological shift occurs when the pronunciation changes, as when *heal* becomes *health* and *healthy*. If a student learns the word *ignite*, will he then recognize *ignition*? Possibly not, given that both the pronunciation and the spelling of *ignite* shifts when the suffix is added to form the longer derivation. Phonological and orthographic shift occurs regularly in morphologically complex words, especially in academic derivations formed around Latin roots.

Because this kind of shift occurs so frequently in morphologically complex derivations, it is a matter of concern. Shift can become a hindrance to vocabulary growth. The teacher's job is to make the morphological relationship obvious to the student, despite its cloak of obscurity, and to accustom the learner to this type of shift, so it is expected. When the base word is not clearly heard in the longer, derived form, semantic relations are obscured, possibly impeding understanding. However, with instruction, students can get excited about uncovering connections previously shrouded by shift. They can marvel to discover—through similarities in spelling and meaning—that *pleasure* and *pleasant* come from *please*, despite the shifting sounds. They can note that the spelling follows the “rules” for adding suffixes that begin with a vowel to bases that end with a vowel.

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Compound words are also plentiful in the English language. As a morphological structure, *compounding* occurs when two or more bases combine to form a morphologically complex word (for example, *rainbow*, *ice cube*, *ruby-throated hummingbird*). To facilitate vocabulary growth, students need to grasp an essential concept about compound structure: In the majority of compound words, the meaning-bearing load is placed at the end. The last word is the key; it names the category.

A *doghouse* is a type of house, not a type of dog. However, a *housedog* is a type of dog. A *snowplow* is a plow, but a *snowstorm* is a storm, because the most meaningful load is found at the end of the compound word. (There are other types of compounds that do not follow this pattern but this is the most common structure).

Some students do not understand—even subconsciously—how compounds convey meaning and grammatical function. Nagy, Berninger, Abbott, Vaughan, and Vermeulen (2003) found that many of the 195 at-risk readers and writers they tested did not intuitively understand noun-noun compounds (*barnyard* is a noun-noun compound, for example). When shown a picture of bees in the grass and asked to decide between two options, the second graders were as apt to name the pictured grass “grass bee” as they were to call it “bee grass” (the test also included the opposite question: “Which is a better name for the bees who live in the grass?”). There were 14 questions of this nature. At-risk second graders, on average, correctly responded to 52% of the items and at-risk fourth graders correctly responded to 72% of the items. This warrants concern, because well before fourth grade, Common Core State Standards apparently assume that compound word structure is already understood, making way to study Greek and Latin roots in complex derivations (Authors, 2010).

Straightforward instruction might go a long way to clarify how compound words convey meaning, followed by practice. For example, students could practice compound morphology by connecting word cards (*snow* + *plow*) or by creating a two-column flipbook. Learn how to make a flipbook at the Vocabulogic blog (Ebbers, 2009). A flipbook might include compounds ending in *house* for example: *lighthouse*, *birdhouse*, *bathhouse*, *farm house*, *boathouse*, *playhouse*, *tree house*, *greenhouse*, *dollhouse*, *doghouse*, *firehouse*, *publishing house*, *schoolhouse*, etc. Children might also invent some compounds, describing their inventions to one another. Teachers, meanwhile, pay attention to their thinking process: For example, a first grader says: “My \*bookhouse is a house full of books!” His friend says: “Yeah? Well my \*bookhouse is a house made out of books, all stacked up into walls.” If another student describes a \*bookhouse as a type of book, not a type of house, as with: “My \*bookhouse is a book I keep in my house,” then the student does not grasp how compound morphology works and will need additional instruction.

### Morphological Families of Words

Rather than conceptualizing words in isolation, as individual units, students benefit from also learning new vocabulary as part of a network, a morphological family of words, similar in form and meaning, as seen across *timid*, *timidly*, *timidity*, *intimidate*, *intimidation*. Related but not the same, students can explore how these words are alike yet different in meaning, nuance, and grammatical function. They could even invent new words to join the family, perhaps creating an “anti-intimidation league” in the school. Morphological families are included in the Common Core State Standards (Authors, 2010). For example, the grammatical or functional shift in tightly related morphological words is the focus in

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grades 9 and 10: “Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., *analyze, analysis, analytical; advocate, advocacy*).”

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No need to wait until high school, though. Begin to focus on morphological families in the primary grades. Integrate morphological awareness into lessons on syntactic, orthographic, and phonological awareness. For example, if the students have already learned to decode the vowel team -ai- as in *paint*, they could build a network of vocabulary words through the morphological family surrounding *paint*: *painting, painted, paints, paintbrush, paint-box, etc.* Each time, point out the base word *paint* and have the students write it in bold, or in color, or underline it. When the students become familiar with the r-controlled vowel patterns, the family could expand to include *painter* and *finger-paint*. Create a colorful display on the wall, with all the words that embrace the paint family. As new phonetic patterns are learned, add new words to the wall, including compounds like *oil paints, face-painting, etc.* Refer to the wall display. Read the words. Write them. Use them in sentences. And celebrate new inventions, as when a friend's child, surrounded by her artwork, recently said, “I’m so *\*paintiful*. I’m an artist!” In this way, young children begin to perceive morphological patterns, even as they learn to read and write.

Explore morphological families frequently. Point out the outsiders, too—words that seem to belong within the morphological family but do not. For example, discuss how the words *need, needless, and needful* are morphologically related, but *needle* is not. Neither does *reptile* belong with (or come from) *tile*.

### **Sequential, Explicit, and Multisensory Instructional Approaches**

To best facilitate initial success when teaching morphology—thus nurturing self-efficacy and interest—exemplar words must be carefully selected. When first introducing morphemic analysis, choose words with recognizable bases and common affixes, of fairly high frequency. Avoid words that are rare or obscure. Also, choose word meanings that are concrete, not abstract, and imageable, so children can visualize them and perhaps even sketch them (see Wolter, 2014).

Also, when introducing morphology to the class, consider whether each morpheme transparently reflects the meaning of the entire word: It is better to start with *blueberry* rather than *strawberry*—for a strawberry is not a berry made of straw. Similarly, *mistletoe* has nothing to do with toes (or missiles).

Better to discuss the *evergreen* tree. Introduce *blackberry*, but initially hold off on *raspberry*. Start with *sunflower*, not *hollyhock*.

But lest they become frustrated and incorrectly attribute failure to themselves, students also need to learn that morphemic analysis will not always help them unlock word meaning. Explore somewhat fuzzy words like *strawberry*, where the morphological composition is partially obscure. Model curiosity, asking questions: Why straw? Did strawberries grow best covered in straw? Is it a loanword from a foreign language, as seems to be the case with *mushroom*, which probably has nothing to do with ‘mush’ or ‘rooms’ but may be a mangled pronunciation of a French word (*musherun, moscheron, and/or musherum*) denoting ‘moss’ (Wulffson, Wulffson, & Lee, 2003). Thus, when teaching morphology, be prepared to occasionally explore etymology.

In brief lessons, introduce morphemes to the class, one or two at a time initially. Start with the most common prefixes and suffixes. Explain what the morpheme means and how it is spelled and pronounced, giving exemplar words. Utilize inductive and deductive learning approaches. Approach the task moving from part to whole (morphemes to word) and from whole to part (word to morphemes). Let the class practice morphological analysis, with scaffolding consisting of assistance from a teacher or fellow student, or clues embedded into the assigned task. As the scaffolding becomes unnecessary, gradually release the responsibility from teacher to student, until he/she can independently read, spell, and define the morpheme, and explain how it relates to the meaning of an entire word. Some learners will need more practice and scaffolding than others, but researchers have shown that learning difficulties need not be a lasting impediment to gaining morphological awareness.

For example, Apel and Diehm (2014) conducted an eight-week intervention with 75 underprivileged children in grades K–2. Lessons were designed to promote insight regarding how affixes and bases interact in inflections and derivations. The study resulted in statistically significant gains in morphological awareness, with large effect sizes on most measures (see also Apel & Henbest, 2016). This applies to older students, too. In a case study involving three high school students with learning disabilities, Fishley, Konrad, Hessler, and Keesey (2012) used graphic organizers, flashcards, self-graphing of progress, and error review to teach a list of common morphemes. They found that this type of instruction promoted learning as well as motivation to learn. After three or four instructional sessions, the students successfully defined the morphemes on the list and applied their morphemic understanding to infer the meaning of morphologically complex words.

Morphology instruction must also include context. The goal is to apply morphemic and contextual analysis to infer word meaning (explained thoroughly by Baumann, 2009; Baumann et al., 2007; and in Kame’enui & Baumann, 2012). Working collaboratively or independently, students must apply their morphemic knowledge to connected text on a regular basis, until it becomes habitual, with teachers providing responsive feedback. If teachers regularly and clearly model



this type of vocabulary-solving strategy, students will gradually learn the strategy, and independently apply it, and—if successful—learn to value it. Then the lessons in individual morphemes will become more salient and useful to the student. Embracing a rationale for learning is especially important for older students who have experienced repeated frustration in the academic task (Mastropieri & Scruggs, 2002).

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Finally, reinforcement and review are important lesson components for all learners. There are many ways to practice morphemic knowledge. *Morphemes* are suitable to multisensory practice methods, because they are the building blocks of words, conceptually similar to Legos. Various educational publishers produce morpheme flashcards, concentration games, dice-like morpheme cubes, and morpheme linking sticks. Teachers can create their own morpheme bingo games, matching card games, and memory card concentration. Songs and a few apps are available, too. In addition, students can recycle small paper squares to sort words and to build words. They can invent new words and sketch them. These various types of multisensory tools are useful for reinforcing morphology lessons. Most students tend to enjoy multisensory learning methods, and for overcoming dyslexia, it may be an essential lesson component.

## Success

What does success sound like? A linguistic awakening. Teachers provide standards-referenced, explicit, sequential instruction, nurtured in a language-rich implicit learning environment. Specialists strive for Individualized Education Plan goals that are rigorous but achievable. Students spontaneously point out morphemes they encounter in text and speak proudly about their new knowledge. They are motivated by self-efficacy and interest to use their new knowledge and strategies when reading, writing, speaking, and listening.

The vocabulary-rich classroom resounds with language, including morphological word play. Students build words while enjoying morpheme boggle, with an affix in each square surrounding a base word or root in the center. They might also occasionally play morphological bingo. Teachers stock their shelves with books that celebrate words. They might read aloud a few chapters from *Frindle* (Clements & Selznick, 1996), where Nick Allen invents a new word and begins a linguistic movement that changes his life. When studying the derivational suffix *-ish*, teachers might bring out the delightful children's book *Ish* (Reynolds, 2004), where a frustrated young artist is encouraged to persevere, for his sketch may not look perfectly like a vase, but it is *vase-ish*.

Success? It's a gradual process, a growth construct. It's a fifth grader's year-end reflection, after focusing for about eight

months on morphemic analysis in context, and dictionary use (Baumann et al., 2007). Said Richard: "Before I came to fifth grade, if I read a word that I didn't know, I wouldn't take the time to stop. I would just go straight through it... But now I don't have to do that. I use context clues and everything...so if I find a word I don't know, I stop and think about it for a while..." (p. 120).

Success. An intrinsic and enduring change in how learners approach new vocabulary.

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