Tutorial

Using Morphological Awareness Instruction to Improve Written Language Skills

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**Purpose:** Written English is a morphophonemic language. Researchers have documented that a conscious awareness of the morphological structure of English morphology is predictive of students’ written language skills and that morphological awareness instruction leads to improvements in morphological awareness and in written language skills. The purpose of this tutorial is to provide specific information to clinical scientists and other educators for integrating morphological awareness instruction into their written language instruction.

**Method:** The authors first define morphological awareness and provide an overview of the research on the effects of morphological awareness intervention on improving morphological awareness and written language skills. Measures used to assess morphological awareness ability are then discussed, followed by suggestions for how clinical scientists and other educators can provide morphological awareness instruction to improve the written language skills of the students they serve.

**Conclusion:** By integrating morphological awareness instruction into the services they provide, clinical scientists and other educators will be providing their students with a strong tool to aid written language skills.

**Key Words:** morphological awareness, written language, reading, spelling

In the 1970s, phonological awareness, the ability to analyze the sound structure of words (Mattingly, 1972), emerged as a major topic in reading research. By the 1980s, studies evaluating the effects of explicit teaching of phonological awareness on reading achievement in the preschool and early elementary school years abounded (e.g., Bus, 1986; Lundberg, Frost, & Petersen, 1988; Olofsson & Lundberg, 1983; Treiman & Baron, 1983; Williams, 1980). It was no surprise, then, that the National Reading Panel identified phonemic awareness, the ability to analyze sound structure at the level of individual speech sounds, as one of five vital components of early literacy instruction (National Institute of Child Health and Human Development, 2000). Bus and van Ijzendoorn (1999), however, warned that although it is clear that phonemic awareness training results in increased reading skills, we should not conclude that phonemic awareness is the single most important factor in literacy achievement. Instead, literacy is multifaceted, and literacy instruction should reflect its complex nature. English is a morphophonemic language, and word spellings reflect morphological structure as well as phonological structure. Current standards for students across most states reflect this; the Common Core State Standards provide many benchmarks related to the morphological structure of the English language (Common Core State Standards Initiative, 2010; Gabig & Zaretsky, 2013).

The purpose of this tutorial is to address the morphological structure of language through a discussion of the effect of morphological awareness on written language. Specifically, we first operationally define morphological awareness and provide an overview of the research that addresses the effects of morphological awareness intervention on improving morphological awareness and written language skills. Next, we discuss measures that are used to assess this metalinguistic ability. We conclude the tutorial with suggestions for how clinical scientists and other educators can provide morphological awareness instruction to improve the written language skills of the students they serve.

**Morphological Structure of Language**

Words are composed of morphemes, the smallest units of language that convey meaning. Morphemes can be free...
(i.e., base\(^1\) words; book, clap, good, hook) or bound (i.e., prefixes and suffixes, collectively known as affixes; books, clapped, goodness, unhook). Words that consist of only a free morpheme are monomorphemic, and words that contain both free and bound morphemes are multimorphemic. Multimorphemic words can be inflected or derived. Inflected morphemes change the tense or number of a free morpheme (e.g., clapped, books), whereas derived morphemes change the part of speech and/or meaning of the base word (e.g., goodness, unhook). Prefixes always modify the meaning of a base word, whereas suffixes may or may not affect base words’ meanings.

Many word spellings in English preserve orthographic information about component morphemes, sometimes at the expense of surface phonology (Venezky, 1999). For example, the word “jumped” would be spelled “jumpt” using only surface phonology, but the conventional spelling preserves the morphological past tense marker. Likewise, the word “health” would be spelled “helth” using only surface phonology, but the conventional spelling preserves the morphological base word spelling. Therefore, knowledge of the morphological structure of words is thought to aid primarily in constructing meaning during reading and secondarily in decoding words and creating conventional word spellings.

**Morphological Awareness**

Morphological awareness refers to an individual’s ability to consciously consider the structure of words in terms of the smallest meaningful units and to analyze and manipulate these units (Carlisle, 1995; Larsen & Nippold, 2007a; Nagy, Berninger, Abbott, Vaughan, & Vermeulen, 2003). The definition contains two critical components: (a) consciousness and (b) analysis. Morphological awareness can be operationalized as an individual’s performance on tasks that require conscious analysis of the morphological structure of words (Berninger, Abbott, Nagy, & Carlisle, 2010).

The interest in morphological awareness, and its relation to literacy development, has its roots with the realization that English is a morphophonemic orthography. Chomsky (1970) and Venezky (1970, 1999) were among the first to promote actively that English spelling was influenced by morphology. Chomsky coined the term **lexical spelling** as a way to discuss how English orthography maintains morphemes and is sensitive to their meaning. Venezky (1999) wrote that within the English spelling system, “phonemes and morphemes share leading roles” (p. ix). Indeed, Venezky suggested that the English spelling system “favored the eye over the tongue” (p. 9), providing much more emphasis to morphology than many had given in the past. Since those earlier years, researchers have been investigating morphological awareness and its development (e.g., Anglin, 1993; Berko, 1958; Carlisle, 1995).

Depending on the task, different researchers have demonstrated age or grade differences in morphological awareness skills. Berko (1958) was one of the first to demonstrate that young children (5.5–7 years old) had at least implicit morphological awareness for inflectional morphology, using her classical “wugs” task (e.g., “This is a wug. Now there are two of them. There are two . . .?”). Anglin (1993) demonstrated that first-grade children knew less about derivational suffixes (e.g., changing a noun to an adverb) than did third-grade students, who knew less than fifth-grade students. He discussed these students’ growing level of “morphological problem solving” ability (i.e., the students’ increasing ability to reflect on base words and affixes). Carlisle and Nomanbhoy (1993) found that their first-grade students could perform adequately on a task similar to Anglin’s if the base words and their derived forms represented a transparent relationship (i.e., the base word was heard within the derived form, such as fun and funny). Carlisle (1995) found that first-grade students could also change a derived form to a base form (e.g., “humorous . . . the man has a sense of _____”). Nunes, Bryant, and colleagues published numerous studies early on regarding young students’ developing morphological awareness skills. For example, Nunes, Bryant, and Bindman (1997) found that between the ages of 6 and 10, there is a developmental sequence to the acquisition of the correct spelling of the past tense –ed. Children move through stages of not spelling the inflectional morpheme, to overgeneralizing its use, to correct use. Children’s development in spelling of the affix is related to and predicted by their explicit morphological awareness skills. Other researchers (e.g., Derwing, 1976; Tyler & Nagy, 1989) demonstrated growth on morphological awareness tasks that required students to make judgments about the semantic relatedness between words (build and builder or moth and mother) across upper elementary grades (e.g., fourth through sixth grades). In perhaps one of the most oft-cited studies of morphological awareness growth, Berninger et al. (2010) administered three different morphological awareness tasks to first- through sixth-grade students and found that the steepest amount of growth in morphological awareness was evidenced during the first three years but that growth continued for the remaining three years.

**How Does Morphological Awareness Affect Written Language Skills?**

Children’s implicit awareness of the morphological structure of words influences their spellings as early as kindergarten. For example, young children’s spellings of final consonant blends indicate an implicit awareness of the morphological structure of words. Misspellings of final consonant blends should be similar across monomorphic and morphomorphic words (e.g., Mars and bars, respectively) if children use only phonological awareness. However,

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\(^1\)We use the term base word for free morphemes, one-morpheme words that can stand on their own. The term root is used for a morpheme that serves as the base of a word yet is not an affix. Roots typically are of Latin (e.g., contra-, frig-) or Greek (e.g., auto-, botan-) origin.
Treiman and Cassar (1996) reported that first- and second-grade children more often represented both phonemes of final consonant blends orthographically when the blend’s phonemes represented two morphemes (e.g., bars) than when the blend’s phonemes represented only one morpheme (e.g., Mars). Likewise, children’s spellings of words with alveolar flaps in the early elementary school years also indicate an implicit awareness of the morphological structure of words. Misspellings of alveolar flaps should be similar across monomorphemic and multimorphemic words (e.g., city and dirty, respectively) if children use only phonological awareness in early spelling. However, Treiman, Cassar, and Zukowski (1994) reported that children in kindergarten through fourth grade were less likely to misspell alveolar flaps in multimorphemic words (e.g., dirty, bloody) than in monomorphemic words (e.g., city, spider). Thus, from the earliest stages of writing, children’s spellings suggest that they have at least an implicit awareness of the morphological as well as phonological structure of words.

Not only do children demonstrate implicit awareness of morphological structure in their early spellings, but morphological awareness skills also predict literacy performance of children across the school years (e.g., Apel, Wilson-Fowler, Brimo, & Perrin, 2012; Carlisle, 1995, 2000; Deacon, Kirby, & Casselman-Bell, 2009; Kirby et al., 2012; Larsen & Nippold, 2007b; Roman, Kirby, Parrila, Wade-Woolley, & Deacon, 2009). Effects of the contribution of morphological awareness to reading, including word recognition and reading comprehension, and spelling have been reported; however, the findings with regard to word recognition and spelling have been somewhat mixed.

The effects of morphological awareness on reading comprehension are consistent and robust across grades (e.g., Apel et al., 2012; Carlisle, 2000; Deacon & Kirby, 2004; Kirby et al., 2012). Many researchers likewise have reported that morphological awareness is a unique predictor of word recognition in the early elementary grades (e.g., Apel et al., 2012; Roman et al., 2009). However, the amount of variance explained in word recognition is not as robust as the variance explained in reading comprehension (Carlisle, 1995; Kirby et al., 2012) or the amount of variance in word recognition explained by phonological awareness (Carlisle & Nomanbhoy, 1993). In addition, some researchers have reported that morphological awareness does not account for unique variance in word recognition in lower elementary grades after accounting for phonological awareness and intelligence (e.g., Deacon & Kirby, 2004; Kirby et al., 2012). Decoding (and spelling) in the early grades generally focuses on monomorphemic words (e.g., cat); thus, it is not surprising that morphological awareness is more related to reading comprehension than word recognition in early elementary school (Carlisle, 1995; Kirby et al., 2012). As children progress through literacy achievement and begin to encounter multimorphemic words in text, morphological awareness emerges as a more robust predictor of word recognition (Carlisle, 2000). For example, Roman et al. (2009) reported that morphological awareness uniquely predicted word recognition for fourth, sixth, and eighth graders after accounting for age, phonological processing, and orthographic knowledge.

There is mixed evidence on the role of morphological awareness in spelling monomorphemic words. Werfel (2014) reported that morphological awareness, when considered concurrently with phonological processing and orthographic knowledge, was not a predictor of second- through fourth-grade children’s spelling of monomorphemic words. However, Apel et al. (2012) and Deacon et al. (2009) reported that morphological awareness was a unique predictor of young children’s spellings even after accounting for other linguistic factors. The morphological awareness tasks varied across these studies and may account for the disparate outcomes. As with word recognition, when children progress through literacy achievement, they begin to more commonly spell multimorphemic words. Nagy, Berninger, and Abbott (2006) reported that morphological knowledge and spelling were correlated in fourth and fifth grades ($r = .66$) and that morphological knowledge contributed unique variance beyond phonological memory and nonword decoding ($Z = 2.77$).

Overall, then, there is ample evidence that morphological awareness is an important contributor to reading comprehension, and there is some evidence supporting its role in word recognition and spelling. Given the role of morphological awareness in written language skills, several researchers have evaluated whether morphological awareness interventions improve the morphological awareness and written language skills of school-age children. In 2010, Bowers, Kirby, and Deacon conducted a systematic review of 22 morphological awareness interventions; three years later, Goodwin and Ahn (2013) reported on the outcomes of a meta-analysis of 30 morphological awareness interventions. Across these two articles, the individual studies included in the reviews varied considerably in whether morphological awareness was the sole focus of the intervention, what outcomes measures were used (e.g., judgment task, production task), what the length was of the interventions (i.e., seven sessions over 7 weeks vs. 140 lessons over an entire school year), what the participants’ ages and ability levels were (most often third through sixth grade; typically developing or “less able”), and whether control groups were used.

For the most part, morphological awareness interventions led to moderate improvements in morphological awareness skills; Bowers et al. (2010) reported effect sizes between 0.51 and 0.65, and Goodwin and Ahn (2013) reported a weighted mean effect size of 0.44. Improvements on measures of written language skills varied between the two articles. Bowers et al. (2010) reported effect sizes between 0 and 0.41 on measures of word-level reading and spelling and 0 and 0.28 for reading comprehension. Goodwin and Ahn (2013) reported significant mean effect sizes for decoding ($d = 0.59$) and spelling ($d = 0.30$) but nonsignificant effects for reading comprehension ($d = 0.09$). Both research groups noted that morphological awareness intervention appeared greater (i.e., there were larger effect sizes) when treatment was provided in smaller groups (vs. at the classroom level), when the students were considered to be

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“less able” or “challenged,” or when the students were in the second grade or younger. It is important to note that both synthesis articles found few intervention studies conducted with students in second grade or younger (seven studies across the two articles).

Since those two reviews, Apel and colleagues (Apel, Brimo, Diehm, & Apel, 2013; Apel & Diehm, 2014) have reported on two morphological awareness interventions conducted with kindergarten, first-, and second-grade students from low socioeconomic schools. In the first report (Apel, Brimo, et al., 2013), the 19 kindergarten and 21 first- and second-grade children were provided an intervention focused on increasing awareness of affixes and the relations between base words and their inflected and derived forms. Intervention took place 4 days a week, 30 min per day within small groups of three to four students. After 9 weeks of intervention, medium (d = 0.66) to very large (d = 2.26) effect sizes were obtained for gains in morphological awareness. Smaller but notable gains were noted for word-level reading (d5 ranged from 0.21 to 0.81) and reading comprehension (d5 ranged from 0.52 to 0.71).

Apel and Diehm (2014) conducted the same intervention as a follow-up to their first study. In this follow-up study, a control group was used (approximately 75 students in both the control and experimental groups), and the intervention lasted for 8 weeks. The kindergarten and first- and second-grade students receiving the intervention showed statistically significant gains in morphological awareness with large effect sizes on most measures (most d5s above 0.8). The results on the reading outcome measures were nonsignificant with null to small effect sizes (e.g., d5s of 0.12–0.28). These small effect sizes may have been due to the relatively short amount of intervention time (8 weeks) and/or the fact that most items contained on the reading measures were not multimorphemic, lessening the ability to capture the potential effects of the intervention. In addition, students who began the study with low morphological awareness skills demonstrated similar gains from the intervention as their peers with typical morphological awareness skills, suggesting that the intervention was equally beneficial for students with varying linguistic awareness skills. Overall, the results of the two studies were similar to those reported for older students in the two synthesis articles (Bowers et al., 2010; Goodwin & Ahn, 2013).

Additional research is needed to fully understand the effects of morphological awareness intervention on written language skills and which key components of an intervention may be the best predictors of positive outcomes on measures of written language. There appears to be enough positive data, however, for clinical scientists and educators to implement morphological awareness instruction or to integrate morphological awareness activities as part of a total literacy instructional package for the students they serve. Below, we discuss morphological awareness tasks, primarily those used in the research literature, to provide guidance to clinical scientists and educators on measures that could be used to assess students’ morphological awareness skills. We then provide some specific ideas for increasing students’ morphological awareness skills as a means to improving their overall written language skills.

**Tasks Used to Measure Morphological Awareness**

Before discussing tasks used to measure morphological awareness, it is first important to delineate between morphological awareness and morphological production. Morphological production is simply the use of morphemes during spoken and written language without any conscious attention given to those morphemes. Tasks that measure morphological production merely require knowledge of morphemes without a need for analysis of the morphological structure. One example of a morphological production task is the Test of Early Grammatical Impairment Third Person Singular Probe (Rice & Wexler, 2001). On this task, children see a picture of someone performing an action and are asked to tell the examiner what that person does. For example, one picture is a nurse putting a bandage on a child. The examiner says, “This is a nurse. Tell me what a nurse does.” A correct child response contains the third person singular morphological marker (e.g., “A nurse helps people”). The target response does not, however, require the child to analyze or think about the morphological structure of words.

In contrast to tasks that measure morphological production, morphological awareness tasks require analysis of morphological structure. To date, there is no specific norm-referenced morphological awareness test and only one norm-referenced test (Process Assessment of the Learner—Second Edition; Berninger, 2007) that contains subtests specifically identified as measuring morphological awareness. There are a number of other norm-referenced tests, or sub-tests of norm-referenced tests, that assess morphological awareness, although they are not identified as measures of morphological awareness, such as the Morphological Completion subtest of the Test of Language Development—Primary: 4 (Hammill & Newcomer, 2008; see Apel, in press, for a review of these measures). Further, researchers have developed multiple criterion-referenced morphological awareness tasks when examining students’ morphological awareness skills. These different norm-referenced and criterion-referenced measures require varying levels of analysis; some require only implicit analysis of morphological structure, while others require more explicit analysis.

**Implicit Awareness Tasks**

Some researchers have measured morphological awareness using production tasks that require implicit awareness of the morphological structure of words. Implicit morphological awareness tasks require individuals to use only a low level of morphological analysis. Such tasks may require less conscious analysis of a word’s morphological structure because of the ample contextual support contained in the task item that allows the individual to also apply some world knowledge. For example, in one such production cloze task,
individuals initially are primed with a single word and are then given a sentence to complete orally, such as “Farm. My uncle is a _____” (e.g., Berninger et al., 2010; Carlisle, 1988; Casalis, Cole, & Sopo, 2004). Carlisle’s (1988) production measure has been widely used and adapted; it includes two subtests: (a) Derivation and (b) Decomposition. In the Derivation subtest, individuals are given a base word, and a correct response involves affixing a bound morpheme to the given base word (e.g., farmer in the example above). In the Decomposition subtest, individuals are given a multimorphemic word, and a correct response involves removing the bound morpheme to result in a monomorphemic base word (e.g., “Improvement. My teacher wants my spelling to _______ [improve!”] A somewhat common adaptation of this measure has been to require written, rather than spoken, responses (e.g., Apel et al., 2012). Other researchers have used a similar production cloze task, in which individuals are asked to complete sentences by affixing bound morphemes to nonwords (e.g., “Wap. Today the girl waps. What did she do yesterday? Yesterday she _____ [wapped”]; Walker & Hauerwas, 2006).

Other researchers have measured morphological awareness by using analogy tasks that also tap implicit awareness of morphological structure. For example, one such analogy task requires individuals to complete sentence analogies, such as “The dog is scratching the chair. The dog scratched the chair. The dog is chasing the cat.” (Deacon & Kirby, 2004; Nunes et al., 1997). Sentence analogy tasks typically tap only inflectional morphology. Other analogy tasks require individuals to complete word analogies, for example, “mess: messy:: fun: _____ [funny]” (Bryant, Nunes, & Bindman, 1997; Nunes et al., 1997; Roman et al., 2009). Word analogy tasks have tapped both inflectional and derivational morphological awareness.

**Explicit Awareness**

Some researchers have measured morphological awareness using judgment tasks that involve explicit analysis of the morphological structure of words. Explicit morphological awareness tasks require individuals to exhibit a deeper level of morphological analysis. These tasks place a greater focus on conscious analysis of the morphological structure of words with less contextual support to aid in providing an answer on task items. For example, one such task requires individuals to judge whether two words are morphologically related (e.g., “Does quick come from quickly?”; Carlisle, 1995; Mahony, Singson, & Mann, 2000; Nagy et al., 2003). Other judgment tasks require individuals to select from a closed set the word with the correct affix to complete a given sentence (e.g., “She hoped to make a good _______”: impressive, impressionable, impression, impressively [impression]; Kirby et al., 2012; Nagy et al., 2003, 2006; Singson, Mahony, & Mann, 2000). These tasks generally are administered in written form and have varied in the use of real words and nonwords. Still, other judgment tasks require individuals to determine whether a sentence sounds correct or incorrect; errors are in morphological structure (e.g., “He wants to colonist the moon!”; Singson et al., 2000). Additionally, some researchers have used identification tasks to tap explicit morphological awareness. In these tasks, individuals are instructed to circle affixes, usually in words that contain a nonword base and real affix (e.g., Apel, Diehm, & Apel, 2013). These latter two tasks provide the individual with a sentence context; however, the individual must consider explicitly the morphosyntactic aspects of the words to accurately answer the task items.

Clearly, morphological awareness tasks vary across many domains. Some are administered in spoken language; others are administered in written language. Some involve real words; others involve nonwords. Some require implicit analysis of morphological structure of words; others require explicit analysis. Fortunately, recent work has provided some guidance in choosing appropriate measures, at least for early elementary school students. Apel, Diehm, and Apel (2013) administered a variety of morphological awareness tasks to the same group of first- and second-grade students. They concluded that a combination of written and spoken tasks may be best for children in these early grades and recommended the use of a written affix identification task and a spoken production task.

Clinical scientists and educators have several measures from which to choose when they decide to assess their students’ morphological awareness skills. Although their choices for obtaining normative data are highly limited, they still are able to use criterion-referenced tasks to determine whether their students are able to consciously analyze the morphological structure of spoken and written words for the purposes of reading and writing. Using a set of morphological awareness tasks that examine what students know about morphemes, how words are related to one another because of a shared base word or root, the meaning and spellings of affixes, and the effect affixes have when added on to base words or root spellings should provide a clear picture of areas in which students are knowledgeable or are in need of improvement (Apel, in press). Armed with this knowledge, clinical scientists and educators then can engage students in instructional activities to improve and strengthen their morphological awareness skills.

**Morphological Awareness Instruction**

As mentioned above, morphological awareness necessarily involves a conscious analysis of morphology within spoken and written language. Specifically, morphological awareness includes a conscious awareness of the number of morphemes within a spoken and written word, a conscious knowledge of those morphemes (their meaning and, for written language, what they “look like” or how they are spelled), an awareness of the rules for how base words are modified when bound morphemes are added to them (i.e., how the addition of some suffixes causes a change to the base word, such as with shopping and cries), and a conscious knowledge of the relation between words and their
derived forms (e.g., magic and magician). Because of the broad range of knowledge involved in morphological awareness, there are a variety of activities that can be used to target one or more of these aspects of morphological awareness. The tasks we describe below have, for the most part, been used in investigations of morphological awareness interventions. The focus of these research studies has been on whether the interventions led to increases in students’ morphological awareness and, in some cases, literacy skills. As such, there have not been systematic investigations of the specific activities used within those investigations.

With all activities, we encourage modeling of the task and/or strategy before students are required to perform the activity or demonstrate use of the strategy. Our belief is that we would not be providing the activity unless the students needed to learn the information. Thus, it makes sense to provide models and adequate examples of the new information to be learned before the students are required to provide any evidence that they have some understanding of the strategy or knowledge for which we are providing instruction.

**Segmenting Task**

To increase students’ conscious awareness of the number of spoken morphemes in words, a segmenting task can be used. Similar to segmenting tasks for phonemic awareness, in this activity, students are shown how words can be broken down into their basic units of meaning (e.g., cats breaks down to cat + –s) via counting or signaling in some way (moving blocks or beads) the number of morphemes in a word. When modeling the segmentation of morphemes, it is important to provide an explanation for why each morpheme has been segmented (i.e., cat stands for the animal; –s in this case, when attached to cat, or another noun, means more than one) to ensure that the students understand that the segmentation is based on meaningful units of language. At times in this activity, we will provide examples of words that can be monomorphemic or multimorphemic depending on the context (e.g., band vs. banned) and ask students to consider whether the segmentation will differ. Examples such as these help emphasize that the sound (phonology) of the word does not necessarily influence the decision about the number of meaningful units it contains. Morphological awareness segmenting tasks have been used across a wide range of grades, including kindergarten through second grade (e.g., Apel, Brimo, et al., 2013) and fifth and sixth grade (e.g., Arnbak & Elbro, 2000).

**Word Building Task**

Word building activities can be used to facilitate students’ conscious awareness of written morphemes. These types of activities also can be used to increase their explicit knowledge of the meaning of morphemes and how those morphemes are spelled. Word building activities typically involve combining base words (or roots) with different prefixes or suffixes to create real or novel words. For example, the instructor might have three lists available for students: common prefixes, common suffixes, and common or grade-level base words. Taking one of the base words (e.g., build), the instructor then asks the students to choose a prefix that can be attached to the base word to create a new word. If the students choose the prefix re–, then the group discusses the resulting word: rebuild. The discussion would focus on what re– seems to mean, whether re– has the same meaning effect when it is attached onto other words, whether re– is always spelled the same way, and whether attaching re– to a word causes a change in the spelling of the base word. The same process can be repeated when the students are asked to choose a suffix to attach to the word. In this activity, students are not only learning to consider how many written morphemes are in a word, they also are considering the meaning of the morphemes, the consistency with which morphemes are spelled, and the potential effects morphemes have on base words when they are attached.

Morphological awareness word building tasks have been used widely in the research literature, from students in kindergarten to sixth grade (e.g., Apel, Brimo, et al., 2013; Arnbak & Elbro, 2000; Berninger et al., 2008; Katz & Carlisle, 2009).

**Word Sorts**

Word sorts are another activity that may be used to raise students’ conscious awareness of the spelling of affixes and the rules for how base words are modified when certain affixes are added. Word sorts by their very nature encourage students to discover the rules being taught, which can help them consciously understand and retain the knowledge and rules. In the typical word sort activity, the instructor provides a set of cards that contain words that can be contrasted based on a specific rule or principle. For example, the instructor, after modeling has occurred, might provide cards with words ending with the plural –s suffix that involves two different allomorphs (e.g., cats, dogs) and their counterparts in singular form (i.e., cat, dog). The students then are asked to separate the cards into two piles or columns based on similar properties or elements. If scaffolding is needed, the instructor could provide one card from each category (e.g., cat, cats), verbalize why each card was chosen (e.g., “Cats. Hmm, I hear an /s/ at the end of that word. Cats. [pause] Cat. Hey, I don’t hear an /s/ at the end of that word. [pause] OK, you start sorting cards under one or the other of these cards.”), and then encourage the students to continue to sort the cards.

Once cards have been sorted into different piles, the instructor queries students to determine why the cards are placed into the piles as they are. The key aspect of the activity is that the students verbalize the knowledge or rule to be learned; it is not important that they state the knowledge or rule exactly as the instructor might have verbalized it. In the case of this sort, once the students sort the cards into two piles (plural and singular forms of the words) and verbalize as such, the instructor then enters
into a discussion with the students on what part of the word signaled the difference between the words (the –s), what it means (more than one), and how no matter how it sounds at the end, it is spelled the same. With this sort, a follow-up activity could be to add additional cards with the second orthographic form of the plural (–es, as in busses) and have students deduce the rule for when –es versus –s is used for plural spellings. A variety of researchers investigating morphological awareness intervention have used word sorts as part of their instructional programs, from kindergarten through fourth grade (e.g., Apel, Brimo, et al., 2013; Katz & Carlisle, 2009; Kirk & Gillon, 2009).

**Direct Instruction of Word Roots**

Word building and word sort activities focus much of students’ active awareness on affixes. It is equally important to encourage students to think of word roots, given that many English words are borrowed or derived from Greek and Latin languages (Henry, 1993). Indeed, the majority of words found in text are based on Latin and Greek roots (Henry, 2010). Lists of common Greek and Latin roots are easily found on the Internet. Instructors can provide direct instruction with these. They also can encourage students, after instruction, to conduct searches within texts for examples of those roots. Specific texts (e.g., those with more scientific bases) may be more appropriate for certain roots (e.g., geo- for earth or photo- for light), and other texts (e.g., history books) may be more appropriate for other roots (e.g., dem- for people). Henry (1988, 1993) was one of the first to provide specific information for direct instruction of word roots.

**Word Relatives**

Word searches as described above help students begin to understand relations among words that are linked by common roots. One activity that more directly aids students’ conscious awareness of relations among base words or roots and their inflected and/or derived forms is called the Word Relatives strategy (Apel, Brimo, et al., 2013; Wasowicz, Apel, Masterson, & Whitney, 2012). With the Word Relatives activity, the students are first introduced to the notion that some morphemomic words are related to one another and to a base word or root because of the shared base word or root. Initially, to clarify this concept of meaning relations, the instructor may use the analogy of family members, in which one family member may look and sound like another family member, another may sound but not look like another family member, a third may look but not sound like another family member, and a fourth may not look or sound like another family member, but all are related because they are family. Alternatively, the analogy of a cat family can be used. Some cats share similar-looking fur and sounds, some differ by sound or fur, and some do not share look or sound with their fellow cats, but they still belong to the cat family.

Having solidified the notion of how relatives (or related animals) may differ by look and/or sound, the instructor then introduces that notion with words. The students are provided a base word (e.g., know) and are asked to brainstorm all the relatives they can think of that share meaning with that “main relative” (e.g., knowing, knowledge, knowledgeable, unknowingly). With each suggested word, the instructor confirms that the suggestion shares meaning with the main relative word and then discusses whether the main relative is heard within that suggestion and, when writing it out, whether the main relative is seen within that suggested word. The same process can be conducted with roots; the students are provided a word root (e.g., cert) and its definition (sure) and then are asked to brainstorm relatives (e.g., certain, certificate, certify). Apel and colleagues (Apel, Brimo, et al., 2013; Apel & Diehm, 2014; Apel, Masterson, & Hart, 2004) used this strategy with students from kindergarten through fourth grade; although it easily could be used with older students as well.

**Considerations When Implementing Morphological Awareness Tasks**

The tasks above provide some ideas for improving students’ conscious awareness of the morphological structure of spoken and written language. As clinical scientists and other educators implement some of these activities, it is important to note that there appears to be some degree of developmental progression within morphological awareness. In general, children in the primary elementary grades demonstrate greater awareness of inflectional forms than derivational forms; it is around third grade that children typically demonstrate greater awareness of derivational morphology (e.g., Kuo & Anderson, 2006). Not surprisingly, then, inflectional morphological awareness is mostly associated with literacy skills in younger elementary school students rather than with the literacy skills of upper-grade elementary school students (e.g., Carlisle & Nomanbhoy, 1993).

Another factor to consider, as mentioned in the Word Relatives section above, is the amount of phonological and/or orthographic transparency between the base word or root and its derived forms (i.e., how much the base word is heard and seen in the derived word). Activity items that include words with transparent relations between base words or roots and their derived forms (e.g., golf and golfer) are typically easier to complete than items that represent a shift phonologically (e.g., music and musician), orthographically (e.g., silly and silliness), or both (e.g., busy and busily) (e.g., Apel & Thomas-Tate, 2009; Carlisle, 2000). Thus, when introducing students to the notion of thinking about morphology, clinical scientists and other educators will want to consider the level of transparency the words they have chosen have with their base words or roots.

Finally, it is important to keep in mind that the purpose of increasing students’ morphological awareness skills is to facilitate their reading and writing achievement. Therefore, as students begin to develop an awareness of
morphology through the tasks described above, clinical scientists and other educators should tie this new knowledge to the acts of reading and spelling or writing. For example, after students have discovered explicitly the meaning of a target morpheme and how that morpheme is spelled during a word building task, the students then can be encouraged to search through a text to find examples of that morpheme, read the sentence, and determine how that morpheme is functioning within the sentence in which it was found. Similarly, the instructor could dictate sentences to the students, telling them that there will be opportunities for them to use their new morphological knowledge within one or more of the words in those sentences. With this latter activity, the students would receive practice in representing the correct spelling of newly learned affixes as well as, in some cases, base word modification rules when suffixes are added (e.g., changing a final “y” to an “i” when adding a suffix).

After students have practiced the Word Relatives strategy, they can be encouraged to apply a variation of that morphological awareness strategy “live” during acts of reading and writing. For example, when students encounter a multimorphemic word in a text, the instructor can encourage the students to consider what the “main relative” of the word might be, to help the students deduce meaning of the derived form. The students also can be asked to consider the meaning of the affixes, particularly those that have been learned and discussed through one of the other activities reviewed above. Similarly, when confronted with a word to be spelled during a writing assignment that is not automatically known, instead of choosing an alternative word, students can be encouraged to think of the “main relative” and to use that base form, along with their knowledge of affixes, to aid in spelling the derived form. Although this strategy may not always result in the exact spelling, it likely will result in a spelling that is near enough to the accurate spelling that it elicits the correct spelling when run through a spell-check program.

Conclusion

Morphological awareness is receiving an increasing amount of attention in the research and clinical literature. With a quick search of literacy-related scientific journals (e.g., Reading Research Quarterly; Topics in Language Disorders; Scientific Studies of Reading; Reading and Writing: An Interdisciplinary Journal; and Journal of Learning Disabilities), clinical scientists and other educators will find recent articles, and in some cases whole issues, devoted to morphological awareness development, assessment, and intervention. These articles continue to expand what is known about the acquisition of morphological awareness, its contributions to literacy development, and methods for assessing and teaching morphological awareness.

It always will be important to keep in mind that morphological awareness is only one aspect of linguistic awareness that contributes to students’ literacy skills. As several have argued before (e.g., Apel, Masterson, & Wilson-Fowler, 2011; Berninger et al., 2010), students use their knowledge and awareness of sounds (phonemic awareness), letter knowledge and patterns (orthographic pattern awareness), and meaning (semantic and morphological awareness) to read and spell. The greatest impact on literacy skills will likely result from instruction that includes all of these linguistic components.

Written English is a morphophonemic language. Researchers have documented that a conscious awareness of the morphological structure of English is predictive of students’ written language skills (e.g., Apel et al., 2012; Carlisle, 2000; Kirby et al., 2012) and that morphological awareness instruction leads to improvements in morphological awareness as well as in written language skills (e.g., Apel, Brimo, et al., 2013; Apel & Diehm, 2014; Bowers et al., 2010; Goodwin & Ahn, 2013). As such, clinical scientists and other educators should be aware of how they can assess morphological awareness and, perhaps more important, provide instruction in this area. This tutorial has provided examples of strategies and activities to increase students’ awareness of the morphological structure of the English language, particularly within the written form. Professionals also should keep in mind that their work in morphological awareness ties directly to student expectations as listed in the Common Core State Standards (see Gabig & Zaretsky, 2013, for specific information). By integrating morphological awareness instruction into the services they provide, clinical scientists and other educators will be providing their students with a strong tool to aid written language skills.

References


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