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# Morphological Analysis and Vocabulary Development: Critical Criteria

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## ABSTRACT

*Morphological Analysis as a vocabulary acquisition strategy has both its advocates and antagonists. Criticism from opponents is often warranted when programs omit one or more of the three critical criteria that establish the framework behind a successful curriculum. The intent behind this paper is to disseminate and explicate these three criteria, along with the methodology employed in a vocabulary acquisition program that was part of a college preparatory reading course.*

## INTRODUCTION

The important link between the extent of one's vocabulary range and reading comprehension is well established (Davis, 1944, 1968; Nagy & Herman, 1987; Stahl, 1982, 1990). Incorporating direct instruction of vocabulary into the curriculum, both to adults (Folse, 2004) and children (Beck, McKeown, & Kucan, 2002; Biemiller & Boote, 2006; Nagy, Berninger, & Abbott, 2003), is proliferating. With the adult in mind, logic dictates that instruction in strategies is perhaps the most prudent use of class time.

> If it is accepted that acquisition of more vocabulary is our goal but that there are simply too many words in the language for all or most of them to be dealt with one at a time through vocabulary instruction, then what is the next logical step? Thus, one of the main classroom activities for teachers of vocabulary is the direct teaching of learning strategies related to vocabulary. (Folse, 2004, pp. 89-90)

The content of this article addresses the author's successful use of morphological analysis as a vocabulary instruction strategy among foreign born and native English speaking college preparatory students (see Bellomo, 2005). Discussed in detail is the case for prudent selection of word parts and corresponding vocabulary; also covered are specifics of the program and results of an original study.

## BACKGROUND

Vocabulary strategies are techniques employed by the reader to unlock the meaning of an unknown word when encountering it in text, and/or a deliberate attempt to learn a word for the purpose of future recall. Schmitt (1997) compiled a list of 58 vocabulary acquisition strategies, and then in the form of a questionnaire, asked English language learners (ELLs) to identify from among those strategies the ones they themselves employed. Strategies that were selected were then to be rated based on their perceived helpfulness. The sample was comprised of 600 Japanese students. A total of 150 students were drawn from each of the following age groups: middle school, high school, university, and adult (professionals in language programs that were sponsored by corporations). The study was designed to "isolate changes in strategy use and perceptions as Japanese learners progress through the school system and into adult English classes" (p. 223). Broadly, the list of strategies was dichotomized between discovery strategies (n = 44) used to unlock the meaning of unknown words, and consolidation strategies (n = 14) used to commit words to memory once they had been learned. Schmitt noted that the analysis of affixes and roots was one of only a few strategies that clearly functioned as both a discovery and consolidation strategy. Of the 58 total strategies, 8 of them would most likely be used exclusively by non-native speakers of English, e.g., "using a bilingual dictionary." The remaining strategies were representative of those used by both native English speakers and ELLs.

Resultant trends yielded through the survey indicated that certain strategies appeared more beneficial than others relative to student age. For example, word lists were used progressively less often and deemed less helpful at each subsequent stage of the four levels. Conversely, student perceptions of the helpfulness of root/affix knowledge—as both word attack and mnemonic strategies—increased noticeably up through the levels. Schmitt concluded, "Given the generally favorable response to strategies utilizing affixes and roots, both to help discover a new word's meaning and to consolidate it once it is introduced, it may be time to reemphasize this aspect of morphology" (p. 226).

### Morphological Analysis

Morphological, or Structural, Analysis is the process of breaking down morphologically complex words into their constituent morphemes (word meaning parts). For instance, the word *worker* is comprised of two meaning units, the base *work*, and the inclusion of *–er*, which conveys the meaning of an agent (person or thing) that does whatever is implied in the base. Thus, the worker is one who works; a film projector is that which projects film onto a screen. As students proceed through the grades, course texts will take on increasingly sophisticated language. Oftentimes, these multi-syllabic words will be of the Graeco-Latin origin, which collectively, comprise approximately two thirds of the English lexicon (Carr, Owen, & Schaeffer, 1942). Studies have shown that moving along the word frequency continuum from more frequent to less frequent displays an increased percentage of Graeco-Latin words, while the percentage of Germanic, mono-syllabic words decreases (Carr, et al., 1942; Oldfather, 1940). It is in the academic arena that students will come across an influx of content specific vocabulary throughout the curriculum. Recognizing frequent roots and affixes that transfer among the disciplines can support students as they make sense and attempt to retain the meanings of this deluge of new words. Corson (1997) noted,

> Pedagogical processes of analyzing words into their stems and affixes do seem important in academic word learning. These processes help to embody certain conscious and habitual metacognitive and metalinguistic information that seems useful for word acquisition and use. Getting access to the more concrete roots of Graeco-Latin academic words in this way makes the words more semantically transparent for a language user, by definition. Without this, English academic words will often remain "hard" words whose form and meaning appear alien and bizarre. So this kind of metacognitive development that improves practical knowledge about word etymology and relationships seems very relevant for both L1 [native English speaker] and L2 [non-native English speaker] development. (pp. 707-708)

## Prudent Word Part and Vocabulary Selection

In creating a workable vocabulary strategy curriculum that capitalizes on the strengths of morphological analysis, one must be cognizant of three underlying criteria requisite for a successful program. These components were touched upon by Orleans (1922), but appear to have not been implemented in many books and programs that have deservedly earned the rebuke of cynics discrediting word part analysis. Orleans stated, "The possibility of transfer from the Latin to the English is determined by such elements as similarity of form, similarity of meaning, and perhaps number of derivatives" (p. 559). I will discuss each of these in turn, and then delineate a vocabulary acquisition program that was used among a heterogeneous class of college preparatory students.

### *Similarity of Form*

According to Webster's Third International Dictionary (1993), the root *morph* in morphology is defined as *form*. In Venezky's (1967) article on the patterns of English orthography, the author observed that "Orthography is not merely a letter-to-sound system riddled with imperfections, but, instead, a more complex and more regular relationship wherein phoneme and morpheme share leading roles" (p. 77). To illustrate a morpheme's leading role, were the English writing system to reflect a purely phonetic sound/symbol relationship, the words induce, reduction, and educate might be written respectively as [ĭn dōōs**'**]**,** [rē dək**'** šən], and [ĕj**'** ōō kāt]. However, the root [duc], which means "to lead," would not be apparent either aurally or orthographically since it is spoken, and consequently would be written, as dōōs, dək, and jōōk. Moreover, in the word educate, jōōk would be divided among three separate syllables! Yet a visual cue demonstrating a semantic connection among the words is evident due to the stable form of the morpheme [duc]—regardless of its pronunciation.

As students learn the meaning of a particular word part and corresponding words, the visual cue of the morpheme serves as a mnemonic when encountering those same words later on in text; also, it can often assist as a word attack device when encountering new words derived from the same morpheme. For the latter, this association often will be viable only to the degree that the instructed word part is visually similar to the part found in the derivation, or word family. For example, Brown (see Thompson, 1958) compiled a list of 14 master words that were taught to his adult education students. Based on 20 prefixes and 14 roots, it was claimed that these word parts pertained to "over 14,000 words in the Webster's Collegiate Dictionary and a projected 100,000 words in an unabridged dictionary" (p. 62). Such claims appear hyperbolic. Indeed, based on the divergent form of some of the master roots, the success of transferring

knowledge of word parts from the known to the unknown is problematic. One of Brown's master words was *precept*. The prodigious vocabulary derived from /capere/, the root in this word, comes into question when one considers the variant spellings provided by Brown: *cept*, *cap*, *capt*, *ceiv*, *ceit*, and *cip*. This dissimilarity in form would most likely diminish the amount of words students can realistically expect to know based on the master word *precept*. If students were introduced to a more formalized Latin-centered curriculum, changes in declensions and conjugations would reveal an order behind the spelling changes of /capere/ (Hayriye Karliova, personal communication, July 25, 2008), but the inclusion of such instruction would likely be deemed beyond the scope of a college preparatory program.

To take advantage of similarity of form, a word part should be taught in the form it appears throughout the vocabulary curriculum and will most likely appear in the words students are apt to encounter in their own reading. For instance, the word part /malus/, which means *bad*, would be taught to students as /mal/, which is visually evident in such words as malign, malignant, malicious, malediction, and malefactor. Practical utility, not Classical purity, should be the aim of such instruction.

*Similarity of Meaning (Semantic Transparency)*

I will take the liberty to extend Orleans' prior observation to suggest that not only should the same meaning be conveyed within the family of words being introduced, but that this meaning should be transparent. In other words, there should be a clear (transparent) parts-to-whole relationship between the morphemes in a word and overall meaning in the word itself. For example, the five words above that are based on /mal/ all convey an aspect of "bad." Conversely, an empirical study by Swisher (1988) found the root /fer/ to be "the most difficult to master based on the number of words generated and retention of its meaning after instruction over time" (p. 204). That is not surprising when considering one of the study's instructional words, vociferous, where the root /fer/, which means *to bear* or *carry*, is not semantically transparent (see Levin, Carney, & Pressley, 1988, for an original study in semantic transparency).

Nagy and Anderson (1984) grouped words into six divisions based on semantic relatedness. A zero would indicate a perfectly clear parts-to-whole relationship, while six would suggest that no evident relationship exists between the word parts and the overall meaning of the word itself. Words from half of the six-point continuum were deemed semantically transparent (SEM 0-2) and the remaining divisions were deemed semantically opaque (SEM 3-5). Semantic relatedness was defined in terms of the following question: "Assuming that a child [grades 3-9] knew the meaning of the immediate ancestor, but not the meaning of the target word, to what extent would the child be able to determine the meaning of the target word when encountering it in context while reading?" (p. 310). According to their scheme, it was determined that multiple words from the same family in the SEM 0-2 category would be inferable if the child already knew only one of the related words. For older students (late high school and beyond), it is quite possible for a number of words in the SEM 3 category to be grouped within the transparent word family due to the older students' advanced decoding capabilities and enriched schemata.

> . . . which means that although the meaning of the derived form [from SEM 3] is not completely predictable from the meanings of its component parts, the meanings of the component parts do in fact contribute something to the derived meaning. Even in these cases, then, knowledge of word formation processes will be helpful to the reader trying to figure out the meaning of words in context. (p. 314)

Similarly, knowledge of only one morpheme within a multi-syllabic word can assist in differentiating between commonly confused words. The prefix [*im*-] means "in"; the prefix [*e*-] signifies "out." Knowing that distinction may suffice in obviating the confusion between immigrate and emigrate; one immigrates into a country while emigrating out of his/her original country.

*Number of Derivatives (Ubiquity)*

Building a vocabulary strategy program based on morphological analysis that includes word parts that are stable in form and transparent in meaning will not be of much use if these parts assist in recalling or learning only a few words. Ideally, selected morphemes should transfer to multiple words that will allow the student to obtain much mileage from this strategy. Holmes and Keffer (1995) sought to increase Scholastic Aptitude Test (SAT) scores through a computer program that enlarged students' vocabulary by using classical word parts. In determining which roots to incorporate into the program, the criterion for root selection was determined by whether or not a minimum of five English derivatives per root were found on a particular frequency list.

Ubiquitous word parts, like high frequency vocabulary, may assist in automaticity. Morphologically complex words appearing on the low-end of a frequency list are often more easily recognized when one considers its overall family—those derivations based on the same roots. Nagy, Anderson, Schommer, Scott, and Stallman (1989) contended that the best measure of frequency is not the individual word itself, but the family or those words closely related in form and meaning:

> The word inactivity, for example, is a relatively low-frequency word, occurring less than once in a hundred million words of school text ... If word recognition were determined only by the frequency of the individual word, independent of morphological relationships, this word would be accessed slowly. However, when related words such as active, inactive, activity and activities are taken into account, the family frequency of inactivity is 10 thousand times as great as the frequency of this individual member. (p. 264)

Word families and their association with frequency, then, do not merely multiply a word's frequency but appear to operate exponentially. At present, this author is assembling word parts and vocabulary based on the three aforementioned criteria, and these will be utilized in a college preparatory reading program comprised of both native and non-native speakers of English. Until its completion, good success has been achieved these past twelve years by modifying aspects of the book *Word Power Made Easy* by Norm Lewis (1978). How I have tailored the contents of this text to meet the needs of my students, and the methodology I implemented for a vocabulary acquisition program based on morphological analysis will be the focus of the remainder of this paper.

## The Program

*Text and Supplemental*

*Word Power Made Easy* is a compact trade book of over 500 pages. Major chapters introduce ten keywords based upon a common theme. For example, the topic of one particular

chapter focuses on personality types. Readers are introduced to such types as egotists, extroverts, misanthropes, along with seven others. Several ensuing sessions, until the subsequent chapter, will pick apart these ten keywords to expand the reader's vocabulary based on the roots, affixes, and general word families derived from the keywords.

To facilitate my students' study of this book, I developed a handout composed of ten boxes. Each box corresponds to the vocabulary and word parts students are required to know for a particular week, and these are indexed to the chapters and sessions from *Word Power*. Hence, the ten boxes are a streamlined coverage of ten weeks of instruction. Selected word parts were based on the aforementioned criteria of stable form, semantic transparency, and ubiquity; as well, each box includes relevant transparent vocabulary (Table 1). In all, 65 roots, 42 prefixes, and 24 suffixes were introduced, which accounted for 315 distinct words—or approximately 5 words per root. These words are distinct in that they comprise the same family (malicious, malefactor), but are not derivations based on suffixation (malicious, maliciously). Instead, students were required to utilize inflectional and derivational knowledge in order to correctly identify or produce different word forms based on parts of speech (e.g., noun abstraction, noun thing, noun agent, verb, adjective). Therefore, the amount of potentially different words the student could be expected to know (and be tested on) more than tripled the fixed number of words explicitly taught.

**Table 1.** Week Three of Weekly Word List

***CHAPTER 4: Session 4, p. 55*** (Keywords)
gynecologist psychiatrist dermatologist

Session 5, p. 60

| **Root** | **Prefix** | **Suffix** | **Vocabulary** |
|---|---|---|---|
| Logo/logy | epi | ician (p. 60, 63) | psychology |
| Ped | | | pedestal pedestrian *pedometer* |
| Ocul | | | *binoculars monocle* |
| Ops/optic (p. 62) | | | optician optics biopsy |
| Derm | ***Mis**** ("*wrongly*") (negative prefix) | | *misnomer misuse misunderstand* |
| Session 6, p. 68 | | | epidermis hypodermic |
| | | osis (p. 68) | pachyderm dermatitis taxidermist |
| Psych (p. 87) | | itis | psychosis psychotic psychiatrist |
| Genesis (p. 89) | | | psychogenesis |

***CHAPTER 5: Session 7, p. 81*** (Keywords)
podiatrist psychologist optician optometrist

Session 9, p. 93

| | | | |
|---|---|---|---|
| Meter/metr | tri | ium | thermometer kilometer *thermos* |
| Therm | peri | | *periodic perimeter thermostat* |
| Pous/pod | | | podium *tripod trinity tricycle* |
| Oct | | | octopus octagon periodontal |
| | | | *tri-athlete* trilogy trio |

From Table 1, it can be seen that at times only a few keywords were taken from the initial chapter (in Chapter Four, three out of ten were selected; in Chapter Five, four were selected). Sometimes this was justified because the root of the keyword did not meet the selection criteria. For example, one particular keyword from a previous chapter was *ascetic*, which is based on the root *asketes*. No other word based on the root asketes is given throughout the book, so to include its word part in instruction would be moot due to its lack of productivity. In Chapter Four, the word pediatrician was omitted from among the keywords introduced. This word is based on the root, paidos, which means child. First, the root's form is not visually apparent in the vocabulary item (*paidos* versus *pedia*); additionally, *ped* in pediatrician could be confused with the root *ped* (*foot* as in pedal, moped) that is introduced in the same chapter. Morphological analysis is not as neat and clean as idealism would prefer; one purpose of the supplemental sheet is to keep these introductory lessons relatively straightforward. Once students have established a working foundation, then issues such as false transparency and the spelling of highly assimilatory affixes can be addressed.

Other keywords could have been included from among the set, but were not, simply to keep the learning burden manageable. In this respect, some of the item selection was subjective and would undoubtedly differ from another instructor's selection. I have found that students seldom return this book as a campus buyback at the end of the semester as the author's lucid and casual style make for a pleasurable read. As well, some of the more ardent students choose to comb through its contents to learn on their own what was not covered in class.

Briefly, a few other things to note would be the inclusion of words and word parts in the box that are not covered in the text. Such productive morphemes are highlighted with an asterisk beside them, are typed in bold and italicized font, and have a brief definition or synonym beside them or underneath in parentheses (see ***Mis*** under the prefix section in Table 1). Similarly, words derived from the morphemes but not covered in the text are included in the vocabulary section of the box and are italicized. Sometimes these are deemed as novel words that students, especially ELLs, are not expected to know, such as *misnomer*. Alternately, some easy high-frequency words are included which serve as mnemonics to facilitate recall of the word part, as in *misunderstand*. In an earlier lesson, *bicycle* was added to the vocabulary section to serve as a cue to recall the word part bi (two) due to the obvious visual—two wheels.

*Ongoing Assessment*

Crucial to successfully building students' vocabulary and word part knowledge is making provision throughout the semester for multiple exposures to the target words and word parts. This is done in the form of weekly tests, an extensive mid-term exam (100 questions) and even larger final exam (200 questions). With tests typically given at the end of the week, I have at times given students crossword puzzles (see www.puzzlemaker.com) over the weekend to combat the natural tendency of some to procrastinate, and thus cram, for the weekly test. Since the vocabulary program is implemented in a reading class, I typically do not devote too much time to personal instruction as I prefer that students access content knowledge through reading the book. For a college preparatory class, this method serves to incidentally prepare students as independent learners who will derive much of their course content through texts. Much of what I do cover pertains to material not addressed in the text but included in the weekly box. Also, on the first class after each weekend, I entertain students' questions about anything not clearly

explained in *Word Power*. The nature of their questions evidences how thoroughly students have read the assignment.

The first section of each test covers word parts. Synonyms or brief definitions are given, and students select from a comprehensive list of all the word parts covered that week and match them with their meaning. The second section is formatted similarly, but covers vocabulary. In keeping with informed test creation, several more word parts and vocabulary are given than definitions or synonyms so as to reduce reliance upon the process of elimination. Beginning with the second test and throughout, a third part entails review. Each week the format of the third section differs. Sometimes the review may be presented as multiple choice items, sometimes matching columns, and sometimes the format is more productive in nature. For example, to assess students' recollection of word parts, a word part is given followed by a line to the right of it that provides room for students to supply their own brief definition or synonym. To the right of the line is a set of brackets. Inside these brackets students are to insert P (prefix), R (root), or S (suffix) to correctly identify the type of word part. Thus, a review question for word parts may look like this— ego: _____ [ ]. (Answer, ego: self [R].)

For the vocabulary section, the first four of ten weekly tests will have students fill in the blank to the right of a definition/synonym by selecting from a list of all the vocabulary items introduced that week. For the following three tests, students' knowledge of derivations is incorporated as I then provide two, three, and sometimes four words that can technically be the correct answer, but only one will be deemed correct based on part of speech. For instance, an item might read, "To go against something you've already said, such as, telling others not to raise their voice yet you clearly do" (v). Students knowing the answer will go through the alphabetical list and in this case find two related items, contradict and contradiction. Based on the cue at the end of the question (v), students must select the verb form. For the last three quizzes (eight through ten), this section is similar, but now the part of speech cue (e.g., "v" for verb) is omitted and students must supply the correct form based on context.

*Recall and Depth of Learning*

Though much of the format of the weekly tests requires students to access recall, and the two major exams are exclusively multiple choice, I have not felt this to be a compromise of in-depth learning. Proponents of deep processing suggest that the more involved learners are in storing and productively using a lexical unit, the better their retention. Instruction, therefore, that involved more elaborate manipulation of the target words was believed to be more efficacious than simple recognition activities such as cloze passages or multiple choice. Folse (1999) challenged the belief that one particular activity was necessarily deeper than another. In his work among ELLs, he investigated whether more elaborate activities explicitly resulted in greater depth of processing.

> Since original sentence writing may require more cognitive processing of a word than merely filling in a blank with that word, these results [greater retention] are to be expected. However, it remains to be seen whether the higher gains for original written output are the results of deeper processing or simply more time on task. (p. 7)

Using a within-subjects design, Folse established three conditions with time on task being the critical variable. The elaborative condition required participants to compose an original sentence for each target word. In another condition, students practiced the vocabulary using a fill-in-the-

blank procedure. For the final condition, students completed three fill-in-the-blank exercises using the target words. This last condition was chosen because a pilot study demonstrated that it took ELL students approximately three times longer to create original sentences than to complete one cloze exercise. Thus, this final condition was an attempt to equalize time on task with the so-called deep processing manipulation. His findings demonstrated that the (supposedly) more sophisticated productive task did not result in greater retention than the exercise providing multiple exposures. Both conditions, however, significantly differed from the remaining condition that afforded less exposure. The findings of Folse underscored the importance of repeated exposure to target words in order to strengthen memory links and facilitate retention.

For the two major exams (multiple choice), what instructors may lack in the ability to assess students' depth of vocabulary and word part knowledge can be compensated by breadth. A 200 question final exam in multiple choice format covered about half of the course content. Multiple choice tests are completed relatively quickly by the students, are exceptionally quick in scoring, and objective by design. The benefits of such tests are founded (Vacc, Loesch, & Lubik, 2001). Of course, the ideal way to assess students' understanding of any subject matter would be a one-on-one, or a student-panel oral examination, similar to what doctoral students encounter in their dissertation defense. Along the continuum from such a dynamic interaction to a static multiple choice format is the cost/benefit trade off among time, feasibility, reliability, and penetration of content. What does not differ along that continuum, however, is what the student actually knows. Although the instructor can gain greater insight from one-on-one probing than from a multiple choice exam, that does not alter what the student brings to the test. With my international students, many often study equally as hard regardless of how they will be assessed. Ultimately, exams are not for the benefit of the instructor, but for the student. For many international students, their objective is to learn the language and to succeed in an institution of higher education where all course content will be delivered in English. They clearly see the correlation between an enhanced vocabulary and their academic success (Zimmerman, 1997). To that end, I tend to view my major exams as further teaching aids. I see these as final opportunities to reinforce what has already been covered and to once again strengthen students' memory associations.

Associations based on mere recall do not necessarily minimize the degree to which students can know a word. Graves (1987) created a hierarchy founded on the difficulty involved in learning new words. Learning new words representing known concepts was classified as one of the easier tasks since schemata already exist for the concepts. This was true for both native English speakers and ELLs. Learning new words that represent new concepts was viewed as one of the more difficult tasks. This latter task is more indicative of the language needs of younger students whose concept development is far inferior to that of the college-age student. The chances are far greater that the adult student will already possess concept development for the item; for the ELL, oftentimes an English language equivalent is sufficient to know well the word or morpheme. The simple one-to-one relationship between a word part and its meaning, or the vocabulary item and its synonym, could be embellished by the adult student's rich schemata. Also, to facilitate this, both the morphemes and selected vocabulary items tend to be singular in meaning, thus eliminating the confounding effects of polysemy usually encountered with one syllable, high frequency vocabulary (Just & Carpenter, 1987; Howards, 1964).

### Original Experiment

Positive student feedback over the years testified to the utility of the technique presented here. What had been lacking, however, was substantive empirical research. To assess the program's efficacy, a pretest/posttest design comprising word parts and vocabulary was administered, and replicated, over the course of several semesters (Bellomo, 2005). Native English speaking students comprised one group and foreign students formed two additional groups—students whose language origin was Latin-based (i.e., Romance languages) and students whose language origin was not Latin-based (i.e., Asian languages). Results were compared and contrasted in view of group identity based on language origin. The pretest was used to quantify the extent that pre-existing knowledge of Latinate word parts and morphologically complex vocabulary differed among groups. The identical instrument served as a posttest to measure the extent that direct instruction in morphological analysis resulted in change among the same groups after one semester of instruction. Two sections on both the pretest and posttest yielded a total of four distinct mean scores that formed the primary basis for comparison.

Categorizing students within the college preparatory reading class based on language origin revealed distinctive strengths and weaknesses relative to group identity when learning Latin-based word parts and vocabulary. Though word parts and vocabulary introduced in the course were not exclusively Latinate in origin, the test instrument intentionally limited the items to those derived from Latin. This was an attempt to assess whether or not morphological analysis would offer an unfair advantage to, say, Spanish or French speaking students. In fact, results of a one-way fixed-factor analysis of variance, in conjunction with multiple comparison procedures, indicated that the Latin-based group did indeed perform the strongest. This group had the greatest mean score on all four measurements; however, only for the word part section of the pretest was the difference statistically significant. The non Latin-based group performed the poorest as evidenced by scoring the lowest on three of the four measures, with a statistically significant difference for the vocabulary pretest.

No group began the semester demonstrating mastery of word parts or multi-syllabic Latin-based vocabulary; this was in keeping with observations by Levin, Carney, and Pressley (1988). Thus, college preparatory students in general could stand to profit from such instruction, and indeed, all did. A pretest/posttest comparison for each respective group indicated that all three groups made significant gains on both sections of the test instrument. The results of the study suggest that college preparatory students, regardless of their language origin, enter higher education with limited knowledge of Latinate word parts and vocabulary. The results further suggest that students comprising the heterogeneously populated college preparatory reading class can profit from direct instruction in morphological analysis—irrespective of language origin.

## CONCLUSION

Prior research has demonstrated that college-level content words tend to be morphologically complex, singular in meaning, and likely to be Classical in origin. Reading is the salient skill utilized across the curriculum and often the primary means of content dissemination. Reading, in turn, is principally linked to the extent of one's vocabulary. Consequently, teaching morphologically complex vocabulary at the college preparatory level along with providing a working knowledge of morphemes can assist students toward college readiness.

For such a strategy to be successful, this author has heeded to, and expanded upon, a statement by Orleans in 1922 concerning critical criteria requisite to word part and vocabulary inclusion. To reiterate, word parts are to demonstrate stable form (visually similar in each of the target words), semantic transparency (clear parts-to-whole relationship with the primary meaning consistent in each of the target words), and ubiquity (morphemes are to be found in a minimum of five words from the same family, not mere inflections or from derivations that change only the part of speech).

Student feedback and empirical research both conveyed the viability of this strategy, which was robust enough to meet the needs of students from very diverse backgrounds—a diversity increasingly found within many of today's higher education institutions.

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