Morphological Awareness Intervention: Improving Spelling, Vocabulary, and Reading Comprehension for Adult Learners

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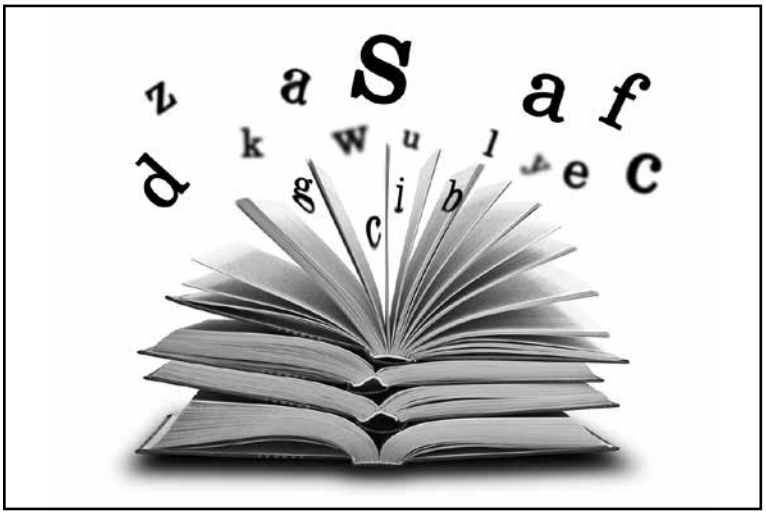

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Abstract

Adult Basic Education programs are under pressure to develop and deliver instruction that promotes rapid and sustained literacy development. We describe a novel approach to a literacy intervention that focuses on morphemes, which are the smallest meaningful units contained in words. We argue that if you teach learners that big words are comprised of smaller components (i.e., morphemes), you will provide those students with the skills to figure out the meanings of new words. Research with children has demonstrated that teaching them about morphemes improves word recognition, spelling, vocabulary, and comprehension (Bowers & Kirby, 2009; Kirk & Gillon, 2009; Nunes, Bryant, & Olsson, 2003). Our hope is that this type of intervention will be successful with adult learners, too.

Introduction

Imagine being able to exponentially grow the vocabulary of your students by teaching them that most words are made up of smaller "pieces" —roots and affixes. This approach—the productive approach (see Stahl & Shiel, 1992), focuses on not only teaching a set of words, but also teaching something about those words that allow the learner to later figure out the meanings of newly encountered words that share "pieces" of those taught words. This approach relies on morphological awareness (MA), which has shown a great deal of promise in reading and writing development for children. Unfortunately, this knowledge has been less studied in adult settings. The purpose of this paper is to explain what morphemes and MA are and how this knowledge is related to a number of literacy skills as well as to describe an intervention for adult learners.

Background

A morpheme is the smallest unit of meaning in a word. For example, the word *clocks* contains two morphemes - *clock* and *-s*. Affixes can change the quantity, tense, and meaning of the root word. The two most common types of morphologically complex words are inflected and derived words. Inflectional morphemes are suffixes that typically change the tense or quantity of a word. The most common inflectional morphemes are plurals (*–s* and *–es*), *-ed*, and *–ing*. These three suffixes account for approximately 65% of all suffixed words (White, Sowell, & Yanagihara, 1989), and, consequently, give students a good base of knowledge regarding morphologically complex words. Derivational morphemes consist of both prefixes and suffixes, and can change the meaning (*kind* to *unkind*) and/or part of speech (*run* to *runner*).

As literacy skills develop, readers gain MA, which is the conscious awareness that many words are made up of smaller components. The ability to understand and reflect on these smaller components is important to literacy development. Anglin (1993) argued that MA provides readers with morphological problem solving skills, which allow readers to figure out the meaning of words. Using morphological problem solving to figure out the meanings of unknown words can increase both the size of one's vocabulary and its rate of development. It is, therefore, not surprising that recent research has investigated MA for its role in reading development.

Not only has MA been implicated in vocabulary, but it also shares relationships with other literacy skills. Jarmulowicz, Hay, Taran, and Ethington (2008) examined the significant relationship between phonological and MA and found that phonological awareness has a greater impact on reading skills up until 3rd grade. MA then builds on phonological abilities and becomes a more important predictor of reading skills after 3rd grade and through the high school years. In addition, MA has been implicated in spelling abilities, which is important in an ABE context since spelling is a frequent complaint among adult learners (Dietrich & Brady, 2001). Finally, MA is also related to listening and reading comprehension for both children (Bowers, Kirby, & Deacon, 2010; Nagy, Berninger, & Abbott, 2006; Tong, Deacon, Kirby, Cain, & Parrila, 2011) and ABE learners (Herman, Gilbert Cote, Reilly, & Binder, 2013; Tighe & Binder, 2015; Tighe & Schatschneider, 2014; To, Tighe, & Binder, 2014).

There have been several morphological intervention studies conducted with children that have demonstrated increases in spelling, vocabulary, and reading comprehension. The studies differ in how they teach MA. Most interventions teach children that many words are made up of smaller parts—roots and affixes. Some of the interventions then spend the majority of the training focusing on teaching children how to segment words into the different morphemes (Arnbak & Elbro, 2000; Kirk & Gillon, 2009; Nunes, Bryant, & Olsson, 2003). These studies have shown increases in spelling, and

they argued that segmenting words into morphemes helps students spell by allowing them to spell one morpheme at a time.

Other interventions have focused more on the semantic aspects of morphology. For example, Bowers and Kirby (2009) highlighted the spelling-meaning connections between words. They did not focus on teaching specific affixes, but rather taught morphological families. For example, the words *instruct* and *construct* are related because they share the same root word. Some of their tools were word matrices and word sums to help demonstrate how morphemes work together to form a variety of words that are still related to each other in meaning (Bowers & Kirby, 2009). A word matrix helps to show all of the morphologically complex words that can be created from one root word by listing prefixes and suffixes that are associated with a given root. A word sum shows how whole words can be constructed from their constituent morphemes. For example, pranc/e + ing → prancing (the slash indicates a letter that is removed). Bowers and Kirby (2009) found that vocabulary increased significantly as a result of their intervention.

Other promising intervention studies have demonstrated growth in reading comprehension (Nunes et al., 2003, Wu et al., 2009). Thus, developing an appropriate morphological intervention for adult literacy students seems worthwhile given the relationships among MA, phonological abilities, word recognition, spelling, vocabulary, and reading comprehension, coupled with the research that demonstrates directly teaching MA to children produces significant increases in these skills.

Project Description

Participant Information

The participants involved in this intervention were from three ABE programs that met three to five days a week. All three levels of ABE were represented with 20.9% in the Basic level (grade equivalent: K – 4th), 30.2% in the Pre-GED level (grade equivalent: 5th – 8th), and 48.8% in the GED level (grade equivalent: 9th – 12th). The programs use varying approaches to literacy instruction typically based on level and the students' needs.

The participants reflected a representative sample for an ABE population from Western Massachusetts. Sixteen males and 27 females ranged in age from sixteen to eighty-three years old with diverse backgrounds (31% Hispanic, 29% Black/African American, 29% White, 9% Other, and 2% Asian). The most common first languages spoken by the participants were English (65.1%) and Spanish (23.3%).

Intervention Description

The purpose of this project was to develop an MA intervention to produce increases in spelling, vocabulary, and reading comprehension for ABE students. The intervention occurred over eight weeks with three, 20-30 minute lessons per week. The lessons were divided into four sections: the introduction, suffixes, prefixes, and word sums and matrices. The lesson format for the introduction and the affixes sections consisted of general discussion regarding the lesson focus including group-brainstorming to get students active in their learning. Then, the instructor led sample exercises followed by completion of worksheets. The word sums and matrices section provided a more exploratory look into the uses and changes affixes provide to various words.

Week 1: Introduction to morphemes. The three introductory lessons focused on defining the concepts of morphemes, suffixes, prefixes, compound words, contractions, and root words. A morpheme was defined as the smallest unit of meaning. Students were asked to think about adding pieces (i.e., *–s*) to a word, if it carries meaning, and how it changes a word. They were provided examples of several words that were either mono- or multi-morphemic, and

asked to identify the root word as well as the affixes—both prefixes and suffixes (See Table 1).

Weeks 2-4: Suffixes. Students studied the role of suffixes in morphologically complex words for three weeks (nine lessons). Students were told that suffixes add meaning to the root word. They were asked to consider how a suffix changed the meaning of the root word throughout every lesson. The first eight lessons focused on various suffixes organized by meaning or function: 1) plural; 2) verb endings; 3) suffixes that carry a "someone who" meaning; 4) suffixes that indicate a "state of being;" 5) suffixes that carry a "characterized by" meaning; 6) adjectives; 7) suffixes that indicate "quality of or related to;" and 8) suffixes that carry a "able to or become" meaning (See Table 1 for examples). In each lesson, students were provided with several examples that demonstrated how suffixes contributed to the overall meaning of the word.

The final suffix lesson was a review of all presented suffixes. The idea that a suffix's meaning contributes to the overall word meaning was emphasized while recognizing the root word and suffix was further reinforced. Namely, students should identify the root word and determine its meaning. Once assessed, they can consider how the suffix may change the root meaning: 1) Did it change the part of speech (i.e., verb to noun as in *run* to *runner*)? 2) Did it change the meaning (e.g., *hope* to *hopeless*)?

Weeks 5-6: Prefixes. Six lessons were devoted to understanding the role of prefixes in multi-morphemic words and organized by meaning or function, including prefixes that :1) indicate number, quantity, and size; 2) carry the meaning "not" or indicate the opposite; 3) indicate location; 4) indicate time; 5) carry a "cause" meaning (See Table 1 for examples). For every lesson, the students were provided with many examples of words with these prefixes to accentuate the idea that the meaning of the prefix is stable, regardless of the meaning of the root word. The final lesson consisted of a review of all previously studied prefixes.

Weeks 7-8: Word sums and matrices. The previous lessons focused on the systematic meaning of various affixes. For example, when students were taught a prefix, the prefix's meaning was explained and numerous examples were provided to reinforce the idea that the prefix plays a systematic role in these words. For the last two weeks, roots, both free and bound, were the primary focus as opposed to the affixes. Free roots are able to stand on their own without other morphemes attached to them (e.g., *care, friend, love*), while bound roots cannot stand on their own—they must be attached to other morphemes (e.g., *struct*, which is the root of words like *construct, instruct*, etc.) which can be difficult to recognize.

This section's goal was to demonstrate that root word meaning remained consistent across word variations and was modified by affixes. Word matrices and word sums were used to help demonstrate how morphemes work together to form a variety of words related to each other in meaning (Bowers & Kirby, 2009). It helps the learner to understand morphological families, which consist of all of the morphologically complex words that can be created from one root word (Bowers & Kirby, 2009). For example, the students were given the root word *care*, provided with many prefixes and suffixes, and shown how to create many words by piecing units together—*childcare, careless, careful, cares, cared, caring, carefree,* etc. This section gave students a chance to build words instead of focusing on disassembling the morphologically complex words as in the previous sections.

Concluding Remarks

In a small pilot study in our lab, we found this intervention to be successful in promoting phonological and morphological awareness, spelling, and vocabulary skills. A general trend of increasing abilities in phonological awareness,

spelling, and vocabulary was demonstrated from pre-test to post-test for those who participated in this intervention. Although these increases were evident, the intervention group was generally outperformed by the control group. However, this could be due to the attrition rate; often, low level students are often the first to drop out due to discouragement and a lack of confidence (Schwertman & Corey, 1989). Participation in the intervention may have given lower level students a reason to continue.

Gains in phonological awareness may be due to the reciprocal relationship that phonological awareness has with morphological awareness (Carlisle, 2012), and suggests that the morphological intervention had a positive effect on phonological awareness. Similarly, increases in spelling and vocabulary abilities suggest that the intervention group may have had a more efficient assimilation of the morphological skills than the control group who had no increases in spelling ability and limited gains in vocabulary. The intervention group demonstrated more gains in skills than the control group, hinting at the potential that this type of instruction could have.

This study suggests that instruction in morphological awareness will benefit other skills, particularly higher level skills. It is most beneficial to develop this skill in later elementary school and beyond. However, since it is moderately correlated with phonological awareness, phonological awareness cannot be neglected either. Phonological awareness and phonics develop before morphological awareness (Anglin, 1993), and research with children demonstrates that phonological awareness has a stronger relationship with these literacy skills for younger children. However, after the 3rd or 4th grade, MA becomes a more important and reliable predictor (Deacon & Kirby, 2004; Nagy et al., 2006). Therefore, developmentally, a student needs to have a good base in phonological awareness before adding the morphological complexity (Carlisle, 2012; Deacon & Kirby, 2004); thus, this intervention might not be effective for those learners who are still developing very basic literacy skills. Inclusion of basic morphemes in instruction while still gaining a firmer, but not an introductory, grasp on phonemes is important for adult learners, because morphology becomes more essential with mature learners (Nagy et al., 2006; Singson, Mahony, & Mann, 2000) due to its positive relationships (in many cases stronger relationships) with other skills (i.e., spelling, vocabulary, comprehension, etc.). We hope that this intervention will produce meaningful growth in ABE learners' spelling, vocabulary, and comprehension abilities. ❖

Kathryn Bangs is currently pursuing a Doctorate degree in Educational Psychology through the University of Georgia, focusing in School Psychology. Her research interests range from forms of communication to language development in special populations, including literacy skills and movement-based communication and languages.

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Table 1—*Lesson Descriptions and Examples*

Week	Purpose	Specific Content	Examples	Activities
1	Introduction	Define the following terms: - Root - Suffixes - Prefixes - Compounds - Contractions	- Compound words: *sunshine, moonlight, without, homemade* - Prefixed words: *disgrace, unlock, bicycle, reread* - Suffixed words: *clocks, kindly, drained, prancing*	- Underline the root word in the morphologically complex word - Game - learners are given cards and they use the words on the cards to create compound words - Underline the affixes in the complex words
2-4	Suffixes	Learn the meaning and use of the following suffix categories: 1. Plural 2. Verb Endings 3. Someone Who 4. State of Being (state, process, or condition of something) 5. Characterized By 6. Adjectives 7. Quality/Related To 8. Able to/Become	1. s, es, ies 2. ed, ing 3. or, er, ian, ist 4. ion, sion, tion, ment, ness 5. ly, ous, ious, eous 6. less, er, est, ful 7. ity, ty, ic, ive, al, ial 8. able, ible, en	- Categorize words from a word bank - Identify the root word and other forms of words based on the suffix - Underline root words and match it to its definition - Match morphologically complex words to their root word
5-6	Prefixes	Learn the meaning and use of the following prefix categories: 1. Numbers, Quantity, & Size 2. Not & Opposite 3. Location 4. Time 5. Cause	1. equ/equi, mega, micro, multi, over, poly, semi/sem, under 2. ir, in, im, il, un, non, anti, de, dis, mis 3. sub, super, mid, intra, trans, inter 4. fore, pre, post, re, pro 5. em, en	- Draw pictures or diagrams to match a prefix's meaning - Word search that provide morphologically complex words in its word bank while the learner searches for the root word - Use a story as context for learning prefix meaning - Underline root words and match it to its definition

Table 1—*Lesson Descriptions and Examples (continued)*

Week	Purpose	Specific Content	Examples	Activities
7-8	Word Sums & Matrices	Learn how to use Word Sums and Matrices: - Introduction of Word Matrices - Explanation of Free and Bound Root Words - Matrix Example - Matrix Practice - Matrix to Sum - Sum Practice - Exploration & Wrap Up	- Free root words: *care, friend, love* - Bound root words: struct, which is the root of words like *construct, instruct*, etc.	- Look for all prefixes and define each of them - Look for all suffixes and define each of them - Identify the root and define it - Determine the definition of the word based on the definitions of the root and affixes - List 3 to 6 other words that are in the same word family - Write appropriate word sums