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Strategic Morphology Interventions for Vocabulary Knowledge in Reading Comprehension

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Abstract

Many adolescent students have been shown to fall behind gradually as they reach secondary grade levels. This has been researched as the effect of socioeconomic factors, lack of immersive vocabulary backgrounds, and gaps in elementary years. Extensive research has shown the benefits of morphology instruction in secondary students in bridging vocabulary gaps, yet many schools have yet to provide them with the support to comprehend difficult texts across content areas. This project explores the possible benefits of offering adolescents the extra support and resources that can leverage reading comprehension across content areas within secondary education. Through the use of implementing morphology interventions for adolescent students across striving schools, students learn strategies to decompose difficult and challenging words within texts into manageable and meaningful word parts, extending their understanding of vocabulary rich curricula.

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Chapter 1

Problem Statement

According to The Hechinger Report, recent reading scores across the US may be worse than originally theorized (Barshay et al., 2021). Interestingly enough, however, this isn't a recent problem. Eighth graders also posted lower scores on the 2019 National Assessment of Educational Progress prior to the pandemic (*NAEP Reading: Reading Highlights 2022*, n.d.). According to the Hechinger Report, analysts report that striving readers' achievements in reading have been declining for a decade (Barshay et al., 2021). They note that the reasoning behind losses from the pandemic are obvious, relating them to the amount of schooling lost and the inequities of resources between socioeconomic status (Barshay et al., 2021). However, prior to the pandemic, these numbers are harder to explain. According to analysts, there are many theories that can explain the decline in reading achievement such as poverty, curricular oversights, emotional traumas, and learning disabilities, just to name a few (Barshay & Flynn, 2021). As a result of the decline, instruction in reading has been hyper focused mainly on sight word reading and phonics, neglecting essentials in literacy such as vocabulary knowledge (Goodwin & Jiminez, 2020).

Goodwin and Jiminez (2020) note that literacy instruction should serve both the role of linking spellings of words and lexical meaning correspondences, but has been heavily narrowed to just focus on word recognition components. Reading and language comprehension should rely on multiple skills, including background knowledge, vocabulary, and language structure. These skills, along with phonics and word recognition skills, should be equally intertwined to form Scarborough's Rope, the components of knowledge needed in the multiple aspects of reading

and sound literacy instruction (Murray, n.d.). David Purphura (2020), a professor from Purdue university, states that the most important goal of literacy learning should be constructing meaning from meaningful word parts and that it is time as educators to start using more precise methods to better support children's language and comprehension ("Do Some Children Really Hear 30 Million More Words Than Others?" 2020). Given that declaration, this project will focus on an explicit morphological awareness intervention as a tool for deeper lexical knowledge as a means to gain comprehension across content areas in adolescents.

Importance and Rationale of Project

Research has shown that for many striving adolescent readers, problems in comprehension may arise due to difficulties in vocabulary knowledge. Vocabulary plays an important role between word identification and comprehension, suggesting that vocabulary and meaningful word parts are necessary for understanding text (Clemens et al., 2016). Due to many factors, including inequities of vocabulary knowledge, also referred to as the 30-million-word gap, and comprehension assessments in early elementary grades, many adolescents lack the foundational skills and vocabulary knowledge to achieve successful reading comprehension skills across content areas in school (Purphura, 2020)**.** Jason Caros (n.d.), a social studies curriculum specialist, states that there is no reason large learning gaps that include vocabulary and background knowledge need to exist; educators have the ability to close the gap by laying the groundwork for achievement (Caros, n.d.).

According to Golinkoff of *Language Matters*, language is the basis for reading and academic success (Golinkoff et al., 2018.). Golinkoff et al. (2018) state that currently in the US there is a large income-based achievement gap when students start kindergarten, directly linked to vocabulary. Golinkoff et al. point to socioeconomic status inequities as the main reason for

achievement gaps later in school. This phenomenon, known as the 30-million-word gap, was developed by Betty Hart and Todd Risley, focused on the idea that children up to age 4 from a lower socioeconomic status heard 30 million fewer words than those from a higher socioeconomic status ("Do Some Children Really Hear 30 Million More Words Than Others?" 2020). Kathy Hirsch (2018) defends the controversial argument of the 30 million word gap by stating that the importance of this statement lies in the quality of words used in meaningful conversations, as those who wish to debunk the theory express that there is no variability in the amount of words heard in total between poor and affluent children. However, language development in children and the richness of vocabulary is increasingly important for acquiring information about the world, building background knowledge, using self regulation skills, and executing functional skills. Hirsch (2018) defends that children need more opportunities to engage and participate in vocabulary rich conversations rather than be bystanders to language (Golinkoff et al., 2018.). The authors reiterate that parents that read and talk to their children about various ideas, help them acquire language, vocabulary, concepts and general knowledge needed in reading comprehension (Golinkoff et al., 2018.). With the increasing demands of reading and comprehension in schools, especially in lower SES districts, interventions focused on vocabulary methods and knowledge, such as morphology instruction, could be crucial in potentially bridging the income based achievement gaps among higher and lower SES students.

Background of the Project

So, does vocabulary matter? Vocabulary and words are the building blocks across all content areas including math, science, and social studies. The Science of Reading, a phrase that represents the accumulated knowledge about reading and reading development, has become a tool to promote literacy skills among a diverse population of students. However, its narrow

interpretation has become problematic due to the lack of deeper meaning conveyed from the term (Goodwin & Jiminez, 2020). A broader representation of the term that focuses on vocabulary and background knowledge is necessary. According to Okkinga et al. (2022), vocabulary knowledge is a prerequisite for success in reading, and students with low vocabulary knowledge may experience difficulties such as cognitive overload when they attempt to comprehend across content areas at the same time as trying to construct meanings of unknown words. Their study concludes that reading comprehension involves several complex processes that use both background knowledge and skills. In lower grades, reading skills are focused on letter and word recognition, while as a student goes up in grade levels, they need to have the ability to give meaning to words and sentences, while simultaneously making inferences and creating mental visualizations of texts as a whole. This can prove problematic for students experiencing cognitive overload, or exerting too much effort into figuring out meanings of words. This, as a result, leaves less ability to comprehend.

Research has shown that 98% of words in a sentence need to be understood to reach an adequate level of comprehension (Clemens et al., 2016.). Feldman (2004) then expresses that intensive instruction of vocabulary and related grammatical knowledge must coincide across subject areas for students to be successful across content domains (Feldman & Inc, n.d.). For example, a child may know what a bicycle is, but a student that understands why it is called a bicycle (bi meaning two) will be able to transfer that knowledge across domains throughout their academic career to find meaning in unfamiliar words more successfully. Yahya (2020) notes that students who have difficulties with morphology will have more trouble understanding words and their meaning (Yahya & Haydan, 2020). Vocabulary knowledge serves as a necessary factor in

higher order comprehension skills. So, to answer the original question, yes, vocabulary does matter.

Maria Murray (2016) states that two key skills are required for reading comprehension: the ability to read the words on a page and the ability to understand them. Vocabulary stands as a central thread between background knowledge and language structure in Scarborough's Rope. Murray (2016) goes on to say that vocabulary is a prominent predictor of reading comprehension, knowing the meanings to words points to the knowledge from which a person constructs, interprets, and reflects meanings of texts.

Referring back to the 30-million-word gap, we can identify students in lower grade levels from lower socioeconomic status households as reading fluently and at grade level. However, they can easily fall behind with subsequent grade levels as content becomes more demanding and vocabulary dependent. Caros (n.d.) is adamant that reading comprehension and academic achievement gaps can be improved significantly. The following shows the reading path of a 3rd-10th grader, noticing how their reading level percentages lower each year as a student goes up in grade level as measured by FCAT (Caros, n.d.).

- As 3rd Grade Students in 2004   70%
- As 4th Grade Students in 2005   66%
- As 5th Grade Students in 2006   64%
- As 6th Grade Students in 2007   63%
- As 7th Grade Students in 2008   53%
- As 8th Grade Students in 2009   47%
- As 9th Grade Students in 2010   39%
- As 10th Grade Students in 2011   38%

According to Caros (n.d.), this is not always due to a sudden change in a student's life resulting in the student falling behind. In early grades, students have explicit instruction in decoding and reading narrative texts. As students get older, more informational texts and complex content will be presented to them. With limited exposure to content specific language outside of school, students of lower socioeconomic status will struggle with the complexities of words due to less explicit instruction of any text related phonics instruction (Caros, n.d.). With the language deficit that these students bear, reading and language comprehension across content areas can pose an interference with their success. Again, there are methods and interventions that can help close the gap between all students of all backgrounds and environments (Dehqan & Samar, 2014).

The Coleman Report is another controversial statement that conceived the idea that schools themselves did little to affect a student's academic outcomes; that is, the inequities of their homes, neighborhoods, and socioeconomic status were greater predictors of academic success (Thomson, 2018.). Reading achievement is based on an accumulation of experiences in language development, access to printed materials, and literacy instruction; resources not as easily acquired in lower SES homes and districts (Romeo et al., 2022.). Knowing the word and knowledge gaps between students of differing social classes, there is a resolution. Intervention studies have shown that literacy activities can improve reading development, regardless of SES (Romeo et al., 2022.).

Statement of Purpose.

The purpose of this project is to create an intervention-based program for interventionists, targeted towards adolescent students that are aiming to achieve success in comprehension by building their vocabulary using morphological awareness to construct

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meaning of unknown words. Morphology is a term describing the smallest meaningful parts of words and how morphemes can be used in vocabulary instruction. Less than 1% of upper elementary reading instruction time was focused on vocabulary in a study conducted by Scholastic (Feldman & Inc, 2004). The researchers of this article emphasize that simply exposing students to vocabulary proves insufficient. The 30 million word gap theory supports this as it emphasizes the importance of vocabulary interactions (Golinkoff et al., 2018.). The gap focuses on the quality of words used in meaningful conversations and the richness of vocabulary that divided students of differing statuses. Simply hearing vocabulary does not deepen understanding, rather students need the breadth of knowledge that comes from using the vocabulary in context of activities and discussions (Feldman & Inc, 2004.). This also aligns with the ideas ofGolinkoff et al. (2018) that show the quality of words is much more important and effective than words heard. As students advance to higher grade levels, morphemic awareness helps students to be better prepared with the increased reading rigor across content areas. The research states that morphological structure of words is directly related with students' vocabulary knowledge, which can prove especially beneficial for students with lower SES and certain learning disabilities due to a difficulty in defining specific vocabulary words (Yahya & Haydan, 2020). Goodwin (2020) has concluded that many different types of morphological knowledge instruction have helped students of varying language and literacy abilities achieve greater reading comprehension, capitalizing on identifying individual units of meanings of words (Goodwin et al., 2020). Morphological awareness leads to increased breadth of word knowledge, which positively affects reading comprehension, making awareness of morphological structures of words a vital role in vocabulary growth and comprehension (Guo et al., 2011).

With the large vocabulary gap between readers, adolescents could benefit from systematic teaching of roots and affixes. By doing this, educators will reduce the number of words that need to be learned by adolescents to 1,000 words from the 3,000 that are estimated as needed to be learned each year (Ellemann et al., 2009). The purpose of a morphology based intervention will be to act as a bridge for vocabulary for striving readers in comprehension. The effects of low comprehension in students may have detrimental impacts such as lacking motivation, problem solving skills, and a reduction in overall learning achievements; however, these can be remedied with explicit interventions focused on morphology (Nanda & Azmi, 2020).

Objectives of the Project

The objective of this project is to provide adolescent students with the necessary tools and skills to help them build their vocabularies in hopes of overcoming comprehension struggles in reading. By focusing on 6th grade standards for this project, students in upper elementary through middle school grades will have a median baseline that can show where they should be and what they need to know in order to grow into the more complex vocabulary processes needed as grade levels progress. Without the mastery of the sixth grade standards, students may struggle across content areas where reading is the foundation. This project will focus on the use of morphemic strategies and knowledge to gain meaning of unknown words in text through the use of three skills: (1) Morphological awareness; (2) Use of syntactic morphological knowledge, which considers how suffixes shift words' parts of speech; and (3) Use of semantic morphological knowledge, which considers using units of meaning to figure out the meanings of words. Standards addressed through this intervention are aligned with Michigan State Standards for grade 6. These include:

R.WS.06.02. Students will use structural, syntactic, and semantic analysis to recognize unfamiliar words in context including origins and meanings of foreign words, words with multiple meanings, and knowledge of major word chunks/rimes, and syllabication.

R.WS.06.05. Students will acquire and apply strategies to identify unknown words and construct meaning.

Through the potential success of this project, other standards addressed will include:

R.9. Reading Attitude

R.AT.05.01. Students will be enthusiastic about reading and do substantial reading and writing on their own.

R.6. Comprehension

R.CM.05.04. Students will apply significant knowledge from grade-level science, social studies, and mathematics texts.

R.7. Metacognition

R.MT.05.02. Students will plan, monitor, regulate, and evaluate skills, strategies, and processes to construct and convey meaning (e.g., decoding unfamiliar words); select an appropriate text type from known genre for particular writing purposes; and use theory/evidence, cause/effect, and persuasive organizational patterns.

Definition of Terms

30 million-Word Gap- The 30-million-word gap was originally developed by researchers Betty Hart and Todd Risley and suggests that children up to age 4 from a lower socioeconomic status heard 30 million fewer words than children from a higher socioeconomic status (Golinkoff et al., 2018).

Affixes- a prefix or suffix that can be attached to the base (VanCleave, n.d.).

Base words-morphologically simplest derivation of a word that is freestanding (e.g. kind) (Crosson & McKeown, 2016).

Cognitive Overload- a situation where one is given too much information at once, or too many simultaneous tasks, resulting in not being able to perform or process the information as it would otherwise happen if the amount was instead sustainable (*What Is Cognitive Overload?*, n.d.).

Decomposition- the process when words are decomposed into explicit representations of their constituent morphemes and put back together to form whole word meaning (de-compose-i-tion) (Stevens & Plaut, 2022).

Derivational Morphemes-morphemes that operate more directly on the meaning of a word (Piccinini, 2023).

Inflectional Morphemes-morphemes that serve a grammatical function, such as the plural -s or the past tense -ed (Piccinini, 2023).

Metacognition- awareness and understanding of one's own thought processes.

Metalinguistics-Metalinguistic involves the ability to analyze, think about, or manipulate language as an object separate from its meaning in or out of context, in other words, thinking about thinking (Li & Wu, 2015)

Morphemic Analysis-morphological analysis refers to the analysis of a word based on the meaningful parts contained within (Piccinini, 2023).

Morphology-a branch of linguistics which studies word structure and how words change their forms when they change grammatical function (Ekwueme & Ukazu, 2020).

Morphological Awareness- the metalinguistic insight that words are made up of meaningful units,the ability to reflect on, analyze, and manipulate the morphemic elements in words (McKeown, 2018).

Prefix-affix placed before the base of a word (e.g., pre-, ab-) (VanCleave, n.d.).

Root Words- A word in an origin language from which English bases are derived (VanCleave, n.d.).

Scaffolding-the activities provided by the educator, or more competent peer, to support the student as he or she is led through the zone of proximal development (Mcleod, 2023).

Scarborough's Rope- Scarborough's Rope captures the complexity of learning to read. Scarborough's Reading Rope is made up of lower and upper strands. When all these component parts intertwine it results in skilled and accurate, fluent reading with strong comprehension.

Science of Reading- The science of reading is a vast, interdisciplinary body of scientifically based research about reading and accumulation of reliable evidence about how we learn to read and how reading should be taught (Goodwin & Jiminez, 2020).

Semantic morphological Knowledge- using units of meaning to figure out the meanings of words.the information in complex words comprised of smaller units, mainly Greek and Latin based, and the ability to manipulate those units to produce meaning (Akbulut, 2019)

Suffix- An affix placed after the base of a word. *derivational (lexical):changes part of speech inflectional (grammatical):* does not change part of speech (VanCleave, n.d.).

Syntactic Morphological Knowledge-refers to how suffixes shift words' parts of speech (Ekwueme & Ukazu, 2020).

Scope of Project

For the purpose of this study, morphology based interventions will be administered to students grades 6-9 as a means to gain understanding of meaningful word parts to further vocabulary and reading comprehension. The intervention will be used as a Tier 2 instruction, identifying students in grades 6-9 that display difficulty in reading comprehension due to no

identifying factors of learning disorders. When speaking of morphology as an intervention, it is typical to think of free and bound morphemes in terms of words that can stand alone, along with prefixes and suffixes. However, morphological knowledge acts as an umbrella term to include explicit (conscious) and implicit (less conscious) awareness of morphological information (Goodwin et al, 2020). The first part of this intervention will focus on inflectional affixes that do not change grammar of words. The second part of the intervention will focus on derivational suffixes added to words that change part of speech to words. Lastly,, the most difficult morphological knowledge dimension according to Goodwin (2020), semantics will be taught.

Research supports that much emphasis needs to be given to morphological knowledge and syntactic knowledge before progressing to semantic morphological knowledge as it can be the most difficult for striving readers with less immersive experiences in vocabulary. This intervention is intended towards middle grade striving readers, specifically those with vocabulary deficiencies. This intervention can also be used with many students with learning disorders as it creates a focus on creating meaning within words rather than whole words, which can reduce the amount of whole words that need to be recalled. The intervention can be modified as a tier 1 support in lower elementary grades, specifically starting in first grade with inflectional suffixes such as -s,-ed,-ing, etc. (Moats, n.d.).

<center>**Limitations**</center>

Limitations of this project include factors such as the motivation of students. According to Howe (n.d.), "Those who attribute failure to lack ability, do in fact, have lower grades and engage in less active learning behaviors.", (Howe). Limitations for this intervention could also include the skill level of adolescents. This intervention is modeled towards students that lack vocabulary knowledge across content areas. Students that have not mastered decoding skills,

would not benefit from this intervention so it is imperative for educators to identify the differences by using an effective assessment and sufficient background knowledge of students. Another factor that could limit the effectiveness of this intervention would be teacher/educator bias. An educator may assume a student should be at a certain level because of their age, but in creating an effective strategy for students in vocabulary, it is important to not skip essential components that may be hidden behind the developmental age a student is perceived to be at.

Chapter 2: Literature Review

Introduction

According to research by Louisa Moats (2023), there is an agreement among reading scientists that core linguistic deficits are a main factor in striving readers of all ages. In adolescent students that are challenged readers, reading becomes a labored task that can result in a lack of vocabulary knowledge, which affects reading comprehension more with each progressing grade level (Moats, 2023). Reading comprehension continues to be an area of difficulty for many students that may lack vocabulary knowledge. In referring to vocabulary for the purpose of this paper, we are focused on meaningful word parts which can embody all structures of a word including base words: morphology. Morphology is defined as the ability to recognize the presence of morphemes in words as a means for students to determine unfamiliar words. Finding meaning within text can prove to be difficult for adolescents who lack reading comprehension due to vocabulary deficits. Thus, morphological awareness helps to decode the words, infer their meaning, and encourage learners to understand and comprehend the complex words in texts (Carlisle, 2011).

The Theory/Rationale section of this paper will focus on two main ideas of vocabulary acquisition and the importance of applying and teaching an explicit strategy for students to gain lexical knowledge. First, focus will be placed on metalinguistics. Morphological awareness is one of the subcategories of metalinguistics that involves the connection between morphological awareness and education (Akbulut, 2019). Secondly, sociocultural theories and scaffolding instruction will be further explained, highlighting the importance of starting small and creating building blocks of knowledge.

Theory/Rationale

Metalinguistics/Decomposition Theories

Metalinguistics involves the ability to analyze, think about, or manipulate language as an object separate from its meaning in or out of context; in other words, thinking about thinking (Li & Wu, 2015). Morphological awareness has been related as having an important place in metalinguistics as a means for reading and comprehension (Li & Wu, 2015). According to Li (2015), research has consistently shown that morphological awareness can promote vocabulary development and have a direct or indirect effect on reading comprehension. Morphological awareness, used as a bottom up processing mode of text, showed an increase of reading comprehension in students as they increased in each grade level by advancing the understanding of word structures (Li & Wu, 2015).

Linguistic theories range from whole word recognition and morphology's role in metalinguistics. According to Gagne (n.d.), there are 5 theories that study the role of morphemic awareness, one of which represents a lens on decomposition of words into morphemes. As a vocabulary-based intervention strategy, a large focus has been placed on decomposition theories.

Decomposition theories propose that complex words are decomposed into their constituent morphemes when reading, prior to recognition and access of the words overall meaning, then it is recomposed putting together lexical morphemes to construct meaning (Stevens & Plaut, 2022). The decompositional approach, theoretically, uses a language's morphological structures to make the storage and processing of words more efficient. Much like orthographic processing, lexical processing (relating to morphemes) has potential to be an automatic process through familiarity, consistency, and higher frequency morphemic structure and exposure. Within a person's lexical knowledge, high frequency words are retrieved more

rapidly and consistently; this same theory is applied in decomposition theory where more exposure to morphemes will result in faster retrieval of meaning in words adding to the breadth of vocabulary knowledge (Stevens & Plaut, 2022). Morphological structure is consistently learned and used in lexical processing, leading to greater gains in reading comprehension. While this does not always apply to all words in language, for example, irregular verbs such as *teach* and *taught,* the model still brings awareness to many complex words and their morphemes as a way to gain meaning of unknown words (Gagne, 2017).

Decomposition methods show promise as an improved approach to understanding the role of semantic processing in learning and recognizing complex words by breaking them apart into their morphemic meanings (Stevens & Plaut, 2022). Again, decomposition methods do not account for linguistically opaque words, but as a basis for a strong foundation of knowledge. Decomposition can be a useful tool for adolescents to recognize parts of words and gain skills to find whole lexical representations of words (Gagne, 2017). Goodwin (2020) notes that students with limited reading vocabulary knowledge use their morphological knowledge more effectively in supporting reading comprehension. Below, the author will provide further explanation of the three categories of morphemic structures and their purpose.

Sociocultural Theories and Scaffolding

Sociocultural theory identifies students' learning and knowledge as constructed within interactions with others. Vocabulary is rooted in sociocultural theory as language is developed through these interactions, however these interactions have been shown to be narrower in lower SES students (Mcleod, 2023). Sociocultural theory, developed by Vyotsky in 1934, specifically looks at the Zone of Proximal development (ZPD), an area that mediates what students can and cannot do (Mcleod, 2023). Vyotsky defines this as "the distance between the actual development

level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with a more capable peer" (Vygotsky & Cole, 1978, p. 86).

A students' ZPD can change significantly throughout populations of students with differing socioeconomic status and as noted by Mcleod (2023), scaffolding, specifically in language instruction is necessary to develop ZPD. This supports the premise that environmental and school surroundings are crucial in cognitive development of students. His idea reflects the idea that students learn better when working with more skilled peers that allow learners to learn and internalize new concepts (Shabani, 2010).

Scaffolding can be used to increase or change a student's ZPD. Mcleod (2023) defined scaffolding as a process that enables a child or novice to solve a task or achieve a goal that would be beyond their unassisted efforts. Thus, the presence of scaffolding tools may remove cognitive barriers between varying SES statuses. This means students are instructed with more knowledgeable adults until mastery of concepts has occurred and positive interactions can occur, allowing learners to work on their abilities more productively in a stress free and positive environment (Mcleod, 2023). Scaffolding instruction can be compared to the idea of a child riding a bike, starting with training wheels and parental support, before learning how to be independent when riding.

Students in less vocabulary rich environments have the opportunity in explicit morphology interventions, to be engaged in vocabulary instruction targeted towards students who lack immersive experiences in vocabulary. Vygotsky described learning as being embedded within social interactions and experiences in the environment (Mcleod, 2023). Students coming from lower SES may have less access to reading materials and language with higher syntactic

and lexical complexity (Romeo et al., 2022). Thus, by using morphology as a scaffolding instructional practice to leverage the gaps between socioeconomic status among students, students will benefit when educators attend to teaching the general patterns of language rather than attempting to teach vocabulary in isolation, which proves to be insufficient (McQuillan, 2019).

<div align="center">**Review of Literature**</div>

Benefits of Morphology

The English language is modeled after Latin in that it uses morphological principles in describing and analyzing language (Ekwueme & Ukazu, 2020). According to Ekwueme (2020), people generally have the ability of accurately producing and understanding words that have never been recognized or generated before as a result of the understanding of their root words. Morphological processing theories suggest that multidimensional lexical representations are present for morphological units, meaning students process the information contained in lexical representations for roots, suffixes, and prefixes (Goodwin et al., 2020). With the decrease of background knowledge and lessening of time given to content areas such as science and social studies among elementary grade levels, morphemic awareness could potentially help older students gain skills in word knowledge that coincide with curricular experience (Crosson & McKeown, 2016).

One study highlighted in the *Journal of Psychoeducational Assessment,* researched a sample of students who were identified as striving readers in the US from two schools, one rural and one suburban. The students identified by Clemens (2016) for the study focused on students with comprehension difficulties. The research concluded that reading comprehension difficulties could be attributed to consistent difficulties in foundational literacy and language, with

vocabulary representing the largest deficit (Clemens et al., 2016). The study parallels the idea that students with inadequate vocabulary need an explicit vocabulary learning strategy in order to read and comprehend successfully because they face a lot of difficulties in understanding complex words and concepts as they progress from primary to secondary grades (Varatharajoo et al., 2015). Due to the disparities within students, using scaffolding in morphology instruction (Goodwin et al., 2020) becomes a process that enables a child to achieve goals that may be otherwise difficult (Mcleod, 2023).

Factors such as socioeconomic inequities and gaps of learning in primary grades due to lack of focus across content areas, lack of understanding of word structures, background knowledge gaps, and learning differences, can attribute to a student having less understanding of vocabulary and reading comprehension as an adolescent (Batman, 2021). Clemens (2016) also states that adolescents with less vocabulary knowledge should not be receiving interventions that are not specifically addressing the lack of foundational skills needed for higher order comprehension skills (Clemens et al., 2016). Clemens (2016) speaks to the notion that these large numbers of adolescents with reading comprehension difficulties are in need of interventions in foundational skills and knowledge areas, which are not typically addressed as instructional priorities with secondary or adolescent students.

According to Gedik (2022), the most important purpose of reading is to make sense of what is being read and that people communicate and understand texts using their vocabulary knowledge that can be gained through reading (Gedik & Akyol, 2022). McQuillan (2019), showed results of his study that supports whole word interventions as far less efficient than free reading, but due to the amount of factors involved in an adolescents' achievement, such as SES and lack of access to books, this isn't always feasible, therefore, it becomes necessary to

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enhance students' explicit knowledge of morphemes through systematic instruction. This clarifies the necessity of using a method like morphemic analysis to enhance students' ability to comprehend a text's meaning (Yahya & Haydan, 2020).

Self-efficacy refers to expectations for success in the future and is dependent upon perceived competence, which refers to the perception of a student's capacity for reading well (Guthrie & Klauda, 2014). Research has found a significant similarity among self-efficacy, self-concept of ability, and perceived competence which have significant positive correlations with reading proficiency and reading volume (Guthrie & Klauda, 2014). Nachson (2018) demonstrated that students with reading difficulties may also suffer from lower emotional skills as a result of this and lower emotional skills and lack of confidence can be linked to these impairments in reading. There is an importance of adding an evaluation process of reading difficulties to provide an appropriate intervention strategy (Nachson & Horowitz-Kraus, 2018). Moats (2023) also states that when older students have experienced reading failure, it is imperative that they be convinced that a renewed investment of energy with a reading strategy will be worthwhile (Moats, 2023). Moats (2023)declares that this can be done by employing students in the task of self evaluation and reflection on their own reading abilities and confidence in academics. By providing students with morphemic strategies, students may gain opportunities to acquire and overcome language barriers that have impeded their ability, by no fault of their own due to SES and other academic barriers, to comprehend texts and succeed in their academic careers.

Morphology Instructional Practices

Goodwin (2020) found that interventions involving morphological knowledge induced the highest results in comprehension. This study provides a foundation to develop instruction

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through scaffolding so morphological strengths and gains can support academic success (Goodwin et al, 2020). Goodwin's research finds that scaffolding morphemic structures can aid students in understanding vocabulary as building blocks. In a study of students from urban areas, the lowest achieving 40% of reading comprehension students were analyzed. Amongst those students, all of them exhibited low vocabulary skills (Clemens et al., 2016), which also reinforces Goodwin's (2020) research to scaffold from the most basic morphemic awareness component before progressing to more complexities in morphemic knowledge, including syntactic and semantic morphology. Scaffolding morphemic instruction can strengthen a student's ability to analyze semantic structures of words for meaning as texts become more complex with each grade level. This research supports that much emphasis needs to be given to morphological knowledge and syntactic knowledge before progressing to semantic morphological knowledge as it can be the most difficult for striving readers with less immersive experiences in vocabulary. In Goodwin's study, semantic morphological knowledge was used the least by students in finding meanings of unfamiliar words (Goodwin et al, 2020). This is in contrast to adults who use this skill more when finding meaning (Guo et al, 2011). Guo shows that as adults, through experience, we gain knowledge and that with age, texts become much more complex and adults need to rely on semantic knowledge more than adolescents and children and do so based on richer experiences with interactions of text (Guo et al, 2011). For this study, scaffolding theories also align and coincide with decomposition theories, specifically in semantic transparent words (Gagne, n.d).

Decomposition methods as a morphological intervention can be used by recognizing words by their parts in the 3 focused areas noted by Goodwin: phonological, syntactical, and semantics of morphology (Goodwin et al., 2020). Using this information, it seems that

decomposition theory can be applied in interventions as part of word studies to familiarize students with high frequency and low frequency word parts to gain lexical knowledge by thinking about word structures.

Phonological Morphemes

Phonological morphology refers specifically to the phonological realization of a morpheme (Ekwueme & Ukazu, 2020). For the purpose of this paper, we focus on phonological morphemes as being defined as inflectional morphemic awareness; the awareness of morphemes concerned with the grammatical function of a root word (Lee et al., 2022). Phonological morphemes concern bound morphemes that involve tense and plurality. This type of knowledge is usually learned early, but should be taught until mastery. For scaffolding purposes, it is best not to assume the skill level of students. According to Fracasso (2014), phonological and morphological awareness is often related to spellings of words and the sounds they make. Phonological decoding and morphological awareness were positively correlated and both were positively correlated to spelling, vocabulary, and reading comprehension (Fracasso & Binder, 2016). The activation of morphemes, activates phonological information (Tang, 2020). For example, when adding a plural morpheme to a base word, phonologically, the sound can vary between /s/ and /z/ and /es/. It becomes important to teach students decomposition methods in order to accurately retrieve lexical representations of words. According to Ekwueme(2020), it is necessary and vital to successful reading and comprehension to have strong knowledge of grammatical morphemes, such as the use of –ing for a present progressive verb, /s/ to indicate plural form, and the correct use of verb tense. Though inflectional morphemes tend to be focused on in elementary grades, Moats(2023) reminds educators not to skip necessary instruction vital to reading comprehension due to a students' age.

Syntactic Morphemes

Syntactic Morphemes focus on derivational suffixes added to words that change the part of speech to words. This acts as syntactic knowledge. Derivational morphemes are morphemes added to roots and can often change parts of speech. For example, *social* to *socialize* or *govern* to *government.* These differences in morphemic structure essentially change the purpose of the meaning of words used in context. Govern acts as a verb, meaning to control, influence, or regulate. -Ment, is added to verbs to form nouns that refer to the action of the word. The same can be used with -er, -or, adding to the end of the word to create a noun that describes when someone is carrying out that action,such as-*governor.*

Syntax in linguistics deals with how words in a sentence can be arranged and rearranged to express different meanings (Ekwueme & Ukazu, 2020). Syntactical Morphemic awareness can help students in understanding and distinguishing that -ment and -ness form nouns, or that -ly forms adverbs in sentences, an indispensable skill needed to understand language and successfully communicate (Ekwueme & Ukazu, 2020). In a study by Goodwin (2020), syntactic morphological awareness produced the highest effect size in reading comprehension, resulting in the premise that higher levels of syntactic awareness reflect greater awareness of language and should be more associated with reading achievement (Guo et al., 2011).

Semantic Morphemes

Recent studies have shown that Greek and Latin roots in morphology has been related to reading comprehension (Whissel-Turner & Fejzo, 2021). In Goodwin's study, semantic morphological knowledge was used the least by students in finding meanings of unfamiliar words (Goodwin et al, 2020), in contrast to adults who use this skill more when finding meaning (Guo et al, 2011). Guo shows that as adults, through experience, we gain that with age; texts

become much more complex and adults need to rely on semantic knowledge more than adolescents and children. The author infers that this is caused from higher background knowledge and experiences, which many striving readers may lack. For example, the word *hypothermia,* an adult might infer the word parts of *hypo* and *therm,* to mean a medical or biological term (Guo et al, 2011). As Hoque (n.d.) states, grammatical structure of language provides clues needed for understanding. Semantics involves the ways that language conveys meaning (Hoque, n.d.).

Moats (2023) states that reading interventions grounded in research can help older students gain the skills they missed in primary grades due to other gaps they may have had in reading achievement due to factors such as lower SES, such as decoding skills (Moats, 2023). She states that it is imperative though that interventions must match a students' level of development as not to miss any other imperative gaps (Moats, 2023). Using a scaffolded process in morphological analysis strategies could be necessary and could theoretically bring a student with vocabulary deficiencies to grade level within one to two years (Moats, 2023). 60% of the English language is theorized to contain Greek and Latin roots, and up to 90% in science and technology related education and fields of study (Carroll, 2015). By using Goodwins model of morphology supports, students have opportunities to utilize strategies in finding meanings of unknown words, furthering their success, through morphological awareness, syntactic, and semantic morphology instruction.Moats also reiterates that students must never bypass any critical skills necessary for fluent and comprehensive reading just because of their age (Moats, 2023). Given this statement, using a scaffolded approach in morphology intervention, students are not assumed to be at a certain level of understanding given just their age. but instead various language and cognitive skills are dependent on multiple factors such as developmental phase and

orthographic depth(Lee et al., 2022). At the basic level, morphemic awareness and phonological morphemes are heavily based on inflectional suffixes that mainly identify plurality and tense based morphemes. However, given that these affixes can assume different sounds dependent upon the word they are attached to, exposure to this morpheme type can allow students to recognize patterns and word structure of words that in turn activate mental representations of words more quickly than reading as whole words. Again, reading skills vary upon developmental phases of students. Morphemic awareness, in terms of phonological and orthographic skills, reach a student's ceiling by grade 3 (Lee et al., 2022), however a student's developmental reading skill set should never be assumed solely on age (Moats, 2023).

Self-Efficacy

Self-efficacy refers to expectations for success in the future and is dependent upon perceived competence, which refers to the perception of a student's capacity for reading well (Guthrie & Klauda, 2014). Research has found a significant similarity among self-efficacy, self-concept of ability, and perceived competence which have significant positive correlations with reading proficiency and reading volume (Guthrie & Klauda, 2014). Nachson (2018) demonstrated that students with reading difficulties may also suffer from lower emotional skills as a result of this and lower emotional skills and lack of confidence can be linked to these impairments in reading. There is an importance of adding an evaluation process of reading difficulties to provide an appropriate intervention strategy (Nachson & Horowitz-Kraus, 2018). Moats (2023) also states that when older students have experienced reading failure, it is imperative that they be convinced that a renewed investment of energy with a reading strategy will be worthwhile (Moats, 2023). Moats (2023)declares that this can be done by employing students in the task of self evaluation and reflection on their own reading abilities and confidence

in academics. By providing students with morphemic strategies, students may gain opportunities to acquire and overcome language barriers that have impeded their ability, by no fault of their own due to SES and other academic barriers, to comprehend texts and succeed in their academic careers.

Summary

According to the authors of *The Influence of Reading on Vocabulary Growth: A Case for a Matthew Effect*, children differ in their ability to derive word meanings from written contexts (Duff et al., 2015). These differences in learning vocabulary through text can be related to differences in working memory, or differences in environmental factors. Duff (2015) states that these individual differences should encourage specific interventions to improve children's skill in deriving word meanings from context. This further backs up the need for direct and explicit vocabulary learning strategies such as morphemic analysis to support student comprehension, especially those who may have vocabulary deficits or difficulties obtaining higher lexical knowledge. By using research supportive of metalinguistics and decomposition theories, sociocultural theories, and understanding the large disparities of background knowledge among students, employing an explicit vocabulary strategy focused on morphology, students will gain a learned lexical tool in order to bridge the gaps in environmental and experiential factors. Students, specifically adolescents, enter secondary education lacking the vocabulary knowledge needed in comprehending such higher order thinking skills required in higher grades.These higher order thinking skills are a students' ability to give meaning to words in sentences (Okkinga et al., 2022). Okkinga (2022) reiterates that vocabulary knowledge is a basic component of this in reading comprehension. Using Goodwin's (2020) research as a model for morphology interventions, students coming from lower SES backgrounds and immersive

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language backgrounds, have opportunities to use morphology as a scaffolding instructional practice to leverage the gaps among these populations of students (McQuillan, 2019). The benefits of morphology intervention have the ability to arm students with the resources and skills to have success in their academic careers associated through self-efficacy and positive outcomes in reading proficiency (Guthrie & Klauda, 2014). Students will use a scaffolded approach in interventions starting with inflectional morphemes, derivational morphemes, and finally semantic morphemes, giving them the building blocks needed overcome word level comprehension skills that may otherwise be cognitively demanding (Okkinga et al., 2022).

Conclusion

Studies have shown consistently that adolescent striving readers tend to demonstrate difficulties among multiple skills like word identification, vocabulary knowledge, and comprehension processes (Clemens et al., 2016). Clemens (2016) supports the interconnectedness of these skills and that deficits in one area will be likely to have a domino effect on all of them (Clemens et al., 2016). Vocabulary plays a mediating role within word identification and comprehension and students who have difficulty in word meaning will face more difficulties in finding true understanding within texts (Clemens et al., 2016). Teaching morphemic units can prove beneficial when addressing metalinguistic theory and sociocultural theory. Students fluent in decoding can use decomposition theories and morphemic analysis to break apart words into small units of meaning in order to compose meaning, requiring less breadth of knowledge in background knowledge and lexicon, while simultaneously using scaffolding measures in order to reach students at their learning level to produce the greatest gains for success (Clemens et al., 2016) (*Key Literacy Component: Morphology*, n.d.) allowing

them opportunities to acquire higher self-efficacy and confidence in reading proficiency and

success across content areas (Guthrie & Klauda, 2014).

Chapter 3

Introduction

Many Middle school aged children have shown to consistently struggle in reading comprehension as higher order of thinking processes are required (*Higher Order Thinking: Bloom's Taxonomy – Learning Center*, n.d.). In Bloom's Taxonomy, a framework for deeper thinking processes, these processes include more rigorous tasks such as analyzing, creating, synthesizing, and evaluating (*Higher Order Thinking: Bloom's Taxonomy – Learning Center*, n.d.). Effective strategies for vocabulary instruction can prove useful in aiding students with less immersive vocabulary experiences to achieve these higher order processes, which may otherwise be daunting due to inequities such as background knowledge across content areas, socioeconomic status, and gaps in foundational skills developed in early elementary grades. Morphemic Instruction could prove beneficial, immersing students in vocabulary building strategies and finding meaning within words to help close the vocabulary gaps within student populations and allow more opportunities for meaningful reading experiences. Varatharajoo (2015) states that students with inadequate vocabulary need a vocabulary learning strategy in order to read successfully because they face a lot of difficulties to understand complex words and concepts as they progress from primary to secondary, and secondary to tertiary education. The author supports the use of explicit morpheme interventions as a strategy to help students understand more complex vocabulary in texts as a means to aid in higher order thinking processes.

The goal of this project is to assist students with vocabulary deficiencies to gain explicit vocabulary strategies that assist them in reading comprehension across content areas. As stated previously, 98% of words need to be understood in order to comprehend a text (Clemens et al.,

2016). Through the use of explicit intervention instruction in the area of morphemes, how words can be broken apart to find meaning and gain understanding, the author and interventionists can broaden a student's lexicon through the use of morpheme knowledge rather than attempting to teach vocabulary words in isolation, which often has little impact on comprehension of texts that contain those words (McQuillan, 2019).

This project will focus on three components of explicit morphemic intervention: phonological, syntactical, and semantics. These components will be listed in chronological order using a scaffolded design beginning with the least complex skill to the most complex. Scaffolding in morphemic awareness, just as any other factor in reading instruction, is important to a student's learning. Using morphemic training and vocabulary strategies that students will learn, students will increase lexical knowledge, leading to higher comprehension within texts across content areas. The author of this project hopes to design an intervention that bridges the gap in vocabulary deficiencies of students with fewer interactions that could have created background knowledge and immersive experiences in vocabulary.

Project Components

This intervention is designed for interventionists as a pull out, 20-25 minute session in a group setting of 4-6 students. The intervention works flexibly with time, allowing students adequate time to grasp concepts or combining lessons to match student ability. The author predicts that the first component of this intervention should be easier and take less time than the second and third components. The author also notes that it may be impossible to teach all morphemes in all categories. Therefore, this intervention will focus on *commonly used morphemes* (Appendix A). The size of a morphemic word family impacts the word processing

abilities of a student, based on the number of base words/affixes; meaning the more a student sees the morpheme, the easier it will be to transfer meaning across many texts.

The author of this project stresses the importance of pre-assessment tools to accurately choose students who may benefit from this intervention. Teachers and interventionists will use a *pre-assessment* (Appendix B) focusing on vocabulary comprehension and grammar usage to determine students that could potentially gain strengths in vocabulary instruction.

Pre-Test Assessments (Appendix B) focused on phonetic morphology, syntactic morphology, semantic morphology, and reading comprehension will take place in the classroom as a tool for Reading/Language Arts teachers to assess comprehension and vocabulary ability of students. Students falling at 70% or below in all areas of the pre-test will be suggested for intervention with morphemic focus. The students that are suggested for intervention will also be taking a survey focused on their own attitude and confidence in reading and comprehension across content areas (Appendix C).

Assessments for each component of the morphology interventions will be administered to students at the completion of each section. Students should pass each section with 90% accuracy in order to move on to next components. Students will also keep a morpheme journal that includes high frequency morphemes so that students may reflect and have data for their own personal growth and evaluation.

Each component of the intervention will be followed by a section of the pre/post assessment (Appendix B) to recognize mastery or the need to revisit and reteach areas of focus. Evaluation of the intervention will involve a final post assessment given to students after an 8-10 week period with the achievement of 90% accuracy.

Below is an example of the three components of the morphology intervention broken down using the base word *Cheer*. These can be aligned with the three subcategories of Goodwin's morphological structures supporting scaffolding instruction. A more in depth explanation with examples can be found in Appendix D.

Base Word-CHEER

Phonological-CHEERED

Syntactic-CHEERFUL

Semantic-CHEERLEADER

Using decomposition methods and morphemic analysis, students are trained to recognize the base of cheer. Given its high frequency in word families, students can assimilate all of the words, recognizing the base word CHEER, to have similar meanings while breaking apart the additional affixes to conclude information of syntax and semantics.

The purpose of the intervention is to expose a vocabulary strategy for students to utilize when reading more difficult texts. The author of this project aims to expose students to commonly used morphemes (Appendix A) and their use and meaning. This allows students with less vocabulary knowledge to identify parts of words to gain understanding within text. Through morphemic analysis, students can divide words into meaningful parts and examine them. Morphemic analysis also allows students the ability to acquire new vocabulary implicitly and comprehend texts' meaning (Yahya & Haydan, 2020).

Implementation of the intervention will begin with phonological morphemic skills, following a post-test(Appendix B). Students that pass the post-test with 90% accuracy will move on to syntactical morphemes followed by a post-test, then finally, semantic morphology.

Original pre-assessments will be administered after the intervention has been finished to collect data on efficacy of intervention.

The components of the intervention will be laid out into a *scope and sequence* (Appendix E) to support the success and scaffolding needed for students. Each component of the intervention will be broken down in each lesson with a daily *schedule of concepts* (Appendix F), followed by *sample lessons of the components* (Appendix G).

Using this information, the author of this project will start using morphological knowledge focused on inflectional morphemes, high frequency prefixes, compound, and base words/single morphemes. The first part of this intervention will focus on suffixes that do not change the words part of speech. This type of knowledge is usually learned early, in grades 1-5, but will be revisited and reinforced until mastery. Also included are common derivational prefixes that can alter a word's meaning, but for scaffolding purposes and high frequencies of affixes, they will be merged into Component 1. Prefixes focused will include **un, re, dis, in, mis**, etc.

The second part of the intervention will focus on derivational suffixes added to words that change part of speech to words. This acts as syntactic knowledge. Derivational morphemes are morphemes added to roots and can often change parts of speech. Syntactical morphemic instruction will show how affixes can change the meaning of words in different contexts and grammar while relating to each other in different forms.

Lastly, the most difficult morphological knowledge component according to Goodwin, semantics, will be taught. Semantic morphology has a large focus on Greek and Latin roots. These prefixes are commonly found among math and science standards and include prefixes such as *bi, tri, super, circum, sub,* and *pro.* The author of this project supports that much

emphasis needs to be given to morphological knowledge and syntactic knowledge before progressing to semantic morphological knowledge as it can be the most difficult for striving readers with less immersive experiences in vocabulary.

By implementing a vocabulary intervention based on these three components of morphology, the author of this project will provide a resource for interventionists to use with students in order to bridge vocabulary gaps and teach skills that students can use to find meanings of words across content areas.

Project Evaluation

Evaluation of the morphology interventions program will be measured by assessment scores of the post assessment (Appendix B), along with a survey of teachers and students across content areas including Reading (Appendix H). The author of this project hopes to give students tools that can allow them to have more positive interactions with text in order to gain confidence. By using a student and teacher survey before and after interventions, data can be drawn on the success and effectiveness of the instructional strategies being implemented in relation to a students confidence in reading and comprehension of content areas.

Following completion of morphemic interventions, the complete post-test (or a slight variation of it) shall be administered to students in order to accurately evaluate students' achievement and growth as a whole. Reading comprehension assessments may be given supplementally if needed. Following the interventions, after a 2 week period, surveys (Appendix B) will be given to teachers of intervention students formatively assessing their ability and attitudes towards reading and also any observances on any changes since the beginning of receiving explicit morphemic interventions. Students will also receive the original survey

administered before interventions focused on analyzing their feelings on reading comprehension across content areas as to gain insight on their perceived level of self-efficacy.

Each component of the intervention will be followed by a section of the pre/post assessment to recognize mastery or the need to revisit and reteach areas of focus. Evaluation of the intervention will involve a final post assessment given to students after an 8-10 week period with the achievement of 90% accuracy.

Project Implementation

Implementation of this project can be used in classrooms across content areas by teachers and reading support staff. Implementation of this project should occur at the beginning of each marking period as to reach as many students as possible throughout the school year and identify students that may benefit from extra support in vocabulary before gaps in learning are widened.

Implementation of this intervention should also continue to be monitored into mid year assessments. As content becomes more difficult, gaps in vocabulary and reading comprehension can potentially be identified before content information can become overwhelming for students. Some students may benefit from revisiting the intervention group for further support throughout the year. The information identified from this intervention can be used and shared among all content area educators, as it can be especially beneficial in science and social studies curricula.

Conclusion

The National Assessment on Educational Progress shows that student scores in comprehension continue to fall. Vocabulary deficits have been shown as significant barriers, resulting in reading comprehension challenges (Clemens et al., 2016). These deficits can be attributed to many struggles such as lack of background knowledge, environmental factors, socioeconomic status, and lack of scaffolded literacy instruction that meets the needs of students.

The author of this project proposes finding a solution to the reading comprehension and vocabulary decline by offering an explicit vocabulary intervention focused on morphology and offering tools to help striving readers overcome the challenges they face.

This project should bring awareness and highlight the importance of vocabulary knowledge and the large vocabulary gaps within student populations. Many students, specifically those with less immersive vocabulary backgrounds, will struggle in comprehension areas as text and higher order of thinking processes become more challenging. Yahya (2020) stated that reading ability is a basic element of education, as students advance in grade levels, comprehension is necessary whether a student needs to read a scientific journal, piece of literature, or even a course syllabus. His findings reveal that direct instruction in prefixes, suffixes and base words significantly increased students' morphological awareness and improved reading comprehension (Yahya & Haydan, 2020). Providing similar outcomes from this project should fuel administrators to employ more interventionists in secondary settings trained in morphology. Secondary students often leave elementary school with gaps in foundational skills that will continuously widen as they lack the extra support in reading and comprehension in middle and high school settings. By providing intervention resources and facilitators, more support can be given and provided to aid teachers' efforts across content areas in comprehension of students. Giving students skills and tools to decompose and find meaning within words will allow them to succeed in all academic areas, furthermore, add to the success of teachers and districts.

Vocabulary knowledge is the center of variances in reading comprehension among students (Guo et al., 2011) and when students are taught strategies on how to use morphological cues, they become aware of ways to help them remember unfamiliar words. Guo et al. (2020)

concluded that morphological awareness directly and significantly predicted reading comprehension. Using this information, the author predicts that using morphemic interventions to bridge the knowledge gap amongst varying student populations will help alleviate the challenges many students face when confronted with more difficult reading comprehension tasks. By using research supportive of metalinguistics and decomposition theories, sociocultural theories, and understanding the large disparities of schema among students, employing an explicit vocabulary strategy focused on morphology, students will gain a learned lexical tool in order to bridge the gaps in environmental and experiential factors.

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Appendices

Appendix A: Commonly Used Morphemes

Component 1 Commonly Used Inflectional and Derivational Affixes

Affix	Meaning	Example
-er	one who, that which, more	teacher, clippers, toaster
-est	compared to	tallest, prettiest
-s	plural/possessive	girls, girl's
-ed	tense form of verb	walked, bounced
-es	plural, tense form of verb	splashes, ashes, boxes
de-	form, reduce, or opposite	defrost, dehydrate
dis-	opposite	dishonest
pre-	before	pretest, preheat
mis-	wrong, bad	misspell, misbehave
re-	back, again	retie, reconstruct
co-	together, with	coparent, coworker
non-	not	nonsense
in-	not	inedible, incoherent
im-	not	imperfect, impossible
un-	not, break apart	uncertain, unsure

Component 2-Commonly Used Derivational Suffixes

Affix	Meaning	Example
-ism	practice, belief	racism
-al	relating to	official, magical

-ity	state or quality of	equality, prosperity
-ance/-ence	act or condition of	endurance, persistence
-ion/-ation	act or condition of	starvation, action
-ize/-ise	to make	pasteurize, advertise
-ary	place for, collection of, one who	literary, involuntary
-ment	state or act of	payment, basement
-ent	someone who/that, inclined to	fluent, dependent
-ant	condition or state/thing or being	mutant, convulsant
-age	result or action of	marriage, advantage
-ous	full of	joyous, prosperous
-ish	somewhat like	foolish
-less	without	penniless, merciless
-ful	full of, having	wonderful, graceful
-ly	to act in a way that is	terribly, kindly, softly
-ible/-able	capable of/worthy of	terrible, predictable
-ology	study of	geology, astrology

Component 3-Commonly Used Semantic Morphemes

Affix	Meaning	Example
port	to carry	transport, import, portable
form	to shape	formulate, formation
tract	to pull	tractor, subtract
rupt	to break	rupture, disrupt

geo	earth, rocks	geothermal
astro	stars, heavens	astrology, astronaut
bio	life	biography, biology
auto	self	automobile, autonomy
homo	same/alike	homonym
hydro	water	hydrogen
micro	small	microscope
phono	sound/speech	phonology, phonics
scope	instruments used to observe/see	telescope
graph	written	grapheme, autograph
phobia	fear	arachnophobia
struct/stru	to build	construct, structure
dict/dic	to tell, say	dictation, predict
cide	to kill/a killer	suicide, homocide

Appendix B: Pre-Assessment/Post-Test

Complete the sentences with the missing word. (non-words)

1. A pank is walking through the tunnel. The pank sees another pank. Now, there are two

   _____.

2. Today I have a chise. I just got another chise. Now I have two _____.

3. I love to gow games. I am gowing games right now. I will gow games tomorrow. Yesterday, I

   _____ games.

Complete the sentences with -ed or -ing.

1. (laugh) I was _____at the movie.

2. (jump)I quickly _____out of the way.

Complete the sentences by adding "dis" or "un"

   1. (Familiar): New and _____people make the animals restless.

   2. (Avoidable): The confrontation was_____.

   3. (honest): Hank does not tell the truth. Hank is _____.

Complete the sentences using "re" or "un" or "mis".

1. (take): I did not do well on the test so now I have to _____it.

2. (familiarize): I have not had a job in awhile so now I have to _____myself

   with having a schedule.

3. (pronounced): My daughter's name is difficult to say, it often gets _____.

4. (interpreted): The boss _____what I said. That is not what I meant.

Label the parts of speech of the highlighted base word in the sentences below. (adjective, verb, noun)

1. I am teaching children how to read. I am a teacher. (teach)

2. The gemologist studies precious stones and identifies them. (gem)

Write the correct base word of the word given.

1. (Growth): She wanted her plant to_____well.

2. (Description): The movie is difficult to_____.

Circle the form of the word that best completes the sentence.

1. Eylie's_____changed as she got older.

a)personify b) personal c) personality d) personalize

2. It can be_____to sell hot cocoa in the winter.

a)profit b) profitably c) profitable d) profitability

Circle yes or no, deciding whether the word is used correctly.

1. Our new boss was very efficient and businessman. (business) YES/NO

2. The party was disastered, nothing went right. (disaster) YES/NO

3. The restaurant was surprisingly good, we enjoyed the atmosphere. (surprise) YES/NO

4. She was sitting comfortably on the porch. (comfort) YES/NO

5. That grown man is acting in a very childy way. (child) YES/NO

6. I was late for work because I over sleeping. (sleep) YES/NO

Reading Comprehension Test

Short Passage 1:

Della received her degree in Communications from the University. Her passion was in abstract art and educating youth in the arts, however. As a human resource consultant of a small business, Della met many people who sought her talents in art and education of the arts. Della started a children's art education program that <u>launched</u> a <u>national </u>focus on art appreciation.

1. The word "launched" means closest to

    a. reorganized

    b. began

    c. wrote about

Passage 2:

When considering how to draw an animal, look first at the size of the paper on which you will be drawing. Be sure to <u>proportion </u>your sketch to that size. Begin with the main <u>torso</u> of the animal. It will generally be the biggest part of the animal. Sketch that by using a large circle, oblong or oval shape depending on the animal. Then you may make a small circle type for the head and <u>elongated</u> circles for legs. If the animal has a tail that is evident, try drawing it as a long slender rectangle. Remember that all of your sketch is in pencil, so you can erase and correct as needed. Making changes in pencil to the animal form is much easier with pencil.

Keep a picture of the animal you are drawing close by while sketching. This will allow you to <u>adjust</u> your artwork as needed by making comparisons. Also, realize that your drawing is your <u>interpretation </u>and does not need to be an exact replica of the animal.

1. What is meant by the underlined word "proportion"?

   a. fit of drawing

   b. color of drawing

   c. type of animal

2. What is meant by "torso"?

   a. head

   b. body

   c. legs

3. What is meant by "adjust"?

   a. move as needed

   b. make revisions to your drawing

   c. color your drawing

In your own words, define the following words based off of what you already know..

1. Hydronaut-

2. Deconstruct-

3. Huntress-

Appendix C: Student Survey

On a scale of 1-5, one being very confident, 5 meaning not confident at all, answer the following questions.

1. ___I can easily understand what I read in class.

2. ___It is easy for me to find the meaning of unknown words using context clues.

3. ___I can identify morphemes, or meaningful parts of words.

4. ___I feel confident in my ability to do well in my classes.

5. ___I feel confident in helping others to understand what we read in class.

6. ___Learning new concepts and ideas in class is something I look forward to.

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Appendix D: Morphology Intervention Components

**1) Phonological-*inflectional and derivational morphemes-*the differences between suffixes and prefixes, and morphemes that can stand alone are an introductory way to teach a student explicitly. Inflectional morphemes do not change the meaning of a word or part of speech. Inflectional morphemes refer to change in tense, number, possession, comparison, and degree. Examples of inflectional changes in words include suffixes such as -ed, -es, -ing, -er, -s, -th. Examples:

jump – jumped

girl – girl's

tough – tougher

Derivational affixes will also be addressed in the first component of the three part intervention. Derivational prefixes can essentially change the meaning of a word but not necessarily the part of speech. The most common prefixes addressed here will include, -re, -un, -dis, -mis, and -in. Examples include:

write-rewrite

dress-undress

honest-dishonest

spell-misspell

**2*) Syntactical-derivational suffixes* can be addressed in morphemes and how affixes can change grammar/ meanings of words. These suffixes will include but are not limited to, -ize, -ment, -er, -or, -ive, -al, -ion. Examples:

govern-government

social-socialize

subject-subjective

teach-teacher

3) *Semantics* of word parts, which can lead through understanding across content areas, opens up students to develop self discovery through words and finding meaning. This can be the equivalent of fostering the

independence of riding a 2-wheeled bike after guidance through the process. The author of this project proposes starting with latin layers previously covered in phonological and syntactical components. While the syntactical component of the intervention have been covered, the author notes that many of the preceding affixes may change parts of speech, but will be more adequately understood as students reach the semantics portion of this project. High frequency latin roots will include -pos(to put or place), -tain(to hold), -vis(to see), -cise(to cut).

precise

entertain

posture

Examples of prefixes can include, -bi, -tri, -co, -super, -circum, etc. Roots of Latin etymology include, -port, -form, -script, etc. Examples:

scripture

triangle

biannually

As students progress through the interventions, Greek layers may also be added. The author adheres to the idea of keeping the scaffolding process throughout all of the components where Greek is the most complex. More than 150,000 words in the English language are derived from Greek etymology. Greek roots can be found at the beginning, middle, and ends of words making an understanding of Greek layers important within decomposition when finding meaning within words. High frequency Greek roots include, -bio, -graph, -scope, -hydro, -macro, etc. Examples:

bio-biology

therm-thermal

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Appendix E: Scope and Sequence of Morphology Intervention

Day 1-2	Introduction to Morphology Morphology Journals Definition of Terms/Practice with Terms	*affix *prefix *suffix *base word *inflectional morpheme *derivational morpheme
Week 1(continued)	Component 1/Inflectional Suffixes	-s -es -er(comparative, *longer, faster*) -ing -ed -est
Week 2	Component 1/High Frequency Derivational Prefixes *Prefixes can be introduced 2-3 at a time dependent upon retention level of students. Adjust exposure and time according to formative assessment of understanding.	de- dis- pre- mis- pro- re- co- non- in- im- un-
Week 3	Formative assessment of Component 1- Administer first 4 sections of Master pre-test. Students should pass with 90% or higher. Review	
Week 3(continued)	Component 2-High Frequency Derivational Suffixes *2 morphemes per day target, can be adjusted to fit the needs of students. *-ation, -ance, -ence, -ion, -ure can be taught together over 1-2 days-all meaning act or condition of	-ism -tude -ate -al -ity -ation -ance -ence -ion -ure
Week 4	Component 2-High Frequency Derivational Suffixes *2 morphemes per day target, can be adjusted to fit the needs of students.	-ize -ise -ary -ment -ent -ant

Week 5	Component 2-High Frequency Derivational Suffixes *2 morphemes per day target, can be adjusted to fit the needs of students. Review Journals/additional support	-less -ful -ly -ible -able -ology
Week 6	Formative assessment of Component 2- Administer sections 5-7 of Master pre-test. Students should pass with 90% or higher. Review	
Week 6(continued)	Component 3-High Frequency Greek and Latin Roots *2 morphemes per day target, can be adjusted to fit the needs of students. Review Journals/additional support	-port -form -tract -rupt -ject -astro -homo -hydro -micro -macro
Week 7	Component 3-High Frequency Greek and Latin Roots *2 morphemes per day target, can be adjusted to fit the needs of students. Review Journals/additional support	-bio -geo -therm -auto -phono -scope -graph -pan -chron -phobia
Week 8	Component 3-High Frequency Greek and Latin Roots *2 morphemes per day target, can be adjusted to fit the needs of students. Review Journals/additional support Cumulative Post-Test	-struct -dict -spect -aqua -mort -script -spire -grad -sept -cide

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Appendix F: Intervention Morphemes Daily Schedule of Concepts

Section	Time
Review of Previous Concept	2 minutes
Purpose/Goal	1 minute
Teaching of Concept	5 minutes
Practice with Concept/Passage Reading	10 minutes
Dictation	if time allows
Reread Passage/Partner Read/Discuss/Record	5-7 minutes

*This is a framework for interventions, some components may be combined based on how students are understanding and retaining the information. The author of this project predicts the first component of this intervention, specifically inflectional suffixes, may be taught quickly and combined for efficient time management. For scaffolding purposes, all components should be introduced and taught still, making and creating the foundational skills needed for more difficult morphology tasks. The most time should be spent on semantics, the third component of this intervention. The author of this project also encourages taking extra time when needed, pulling extra passages, and engaging in word sorts, word maps, and activities for extra support(Appendix).

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Appendix G: Lesson Sample

 Intervention Lesson Component 1

Inflectional Suffixes

FOCUS:–ed and -ing

State Purpose or Goal

Teacher: "Today we are going to work on inflectional suffixes focused on tense. Tense morphemes change a base word, verb, to show when it happens. Right now I am talking to you. Yesterday, I talked to you. The base word verb is talk."

Teaching of Concept

>   **Teacher:** "Can someone remind me what a base word is?"

>   **Students:** Answers may vary, "A base word is a word that carries meaning and can stand alone."

>   **Teacher:** "Yes! When I am reading, I often see affixes like -ed and -ing.

define -ed and -ing-refer to the high frequency morphemes list(Appendix)These affixes do not stand all by themselves but when they are added to the ends of base verbs(action words), they have the ability to give you clues about when something is happening."

**start blinking*

>   **Teacher:** "What am I doing right now? Try this with me! What are we all doing right now?"

>   **Students:** "We are blinking!"

>   **Teacher:** "Great! Notice how you added -ing to the base word blink. It means you are doing it right now. When you leave here today and someone asks you what you did here, what will you say? Will you say 'I blinking' or 'I blinked'?"

>   **Students:** "I will say 'I blinked'.

>   **Teacher:** "Why will you change the suffix added to the base word?"

Students: answers will vary, answers should parallel that blinked means that it happened in the past.   **Teacher:** "Let's read a short passage and highlight -ed and -ing morphemes while we read."

Have a prepared passage focused on -ed and -ing suffixes focused on tense.

You can pull short passages from books or purchase morphology aligned passages like this one

https://www.theliteracynest.com/product/morphology-reading-passages-for-prefixes-suffixes-roots-greek-forms

Practice with Concept/Reading Passage

Have students read passages silently to themselves, highlighting any -ed and -ing words.

Teacher: "Can anyone tell me what this story is about? Who or what is it about?"

let students discuss, prompt when needed.

Teacher: "Who noticed any verbs that had the suffix -ed or -ing? What is happening in the story when you see these, more importantly, when is an action happening? How do you know?"

Dictation:

Teacher: "Let's practice writing and finishing sentences. I will say a sentence with a verb. You write the sentence you hear me say along with the verb and add the correct suffix; -ed or -ing."

"Yesterday, I (jump) over a giant boulder."

"I am (walk) as fast as I can right now."

"Underline your base words in each sentence and box the affix/affixes. Now, write your own sentence using either -ed or -ing."

Reread Passage/Practice with partner or group/Journal

Teacher: "Turn to your partner/partners and take turns reading the passage together and writing the highlighted morpheme words found. Be sure to underline base words and box affixes.

Write and record taught morphemes in your morpheme journal

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Intervention Lesson Component 1/Section 2

Common derivational prefixes

FOCUS: re- and un-

State Purpose/Goal:

      Teacher: "Today we are going to start working on derivational prefixes. Remember, prefixes go at the beginning of a base word. Derivational prefixes are very common, but can often change the meaning of a word slightly. Today, we will focus on re- and un-."

Teaching of Concept:

      Teacher: "If I ask you to retie your shoe, what do you think has happened?"

      Students: answers may vary but will more than likely produce examples such as "My shoe came untied."

      Teacher: "Untied? What does that mean?"

      let students discuss or answer

      Teacher: "Very good! *write the word untied for students to see. "I can see the base word tie in this word. Based on what I know, tie means to put together. *underline the word tie within untied explaining that we always underline base words.*

-ed "This means it already happened."

   "We also see un-. Un- means not, or to break apart."

box un- explaining that we always box affixes

     "Now I see three parts to this word, using my knowledge of morphemes, I can come to a reasoning that this would mean to break apart something put together. We can do the same with retie. Re- means back or again."

 have students write the word, underline the base word and box the affixes, ask them to explain it.

*Have a prepared passage focused on re- and un- prefixes.*You can pull short passages from books or purchase morphology aligned passages like this one

https://www.theliteracynest.com/product/morphology-reading-passages-for-prefixes-suffixes-roots-greek-forms

Practice with Concept:

have students read passage to themselves, looking for words containing re- and -un. Have students practice boxing affixes within words and underlining base words. While students are reading, prepare notecards or scrap papers with base words that un- and re- can be applied to.

> **Teacher:** "Tell me what you thought of that passage, what was happening, was there any conflict in the passage?"

let students discuss, prompt when needed.

> **Teacher:** "who noticed any base words containing the prefixes we just learned about? Can you tell me what they could mean or how you can relate those words to your own life?"

let students answer/discuss

Dictation/Activity:

> **Teacher:** "Today we will define words by adding re- and un- to base words."

pull out premade cards. Let students choose one. Example "assign"

Show the word card, ask students to define and use in a sentence if they can. If they cannot define it, use it in a sentence that will relate to them such as, 'I will assign you homework.' Ask students to add the prefixes to the word assign and illustrate a definition. After illustration, have students discuss and explain their illustrations.

Reread Passage/Partner Work/Journal

*students will reread passages with partner/partners and discuss the highlighted target morphemes/base words *Write and record taught morphemes in your morpheme journal*

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Intervention Lesson Component 2

High Frequency Derivational Suffixes

Focus: -ance, -ation

State or condition of

State Purpose/Goal:

      Teacher: "Today we are going to start working on high frequency derivational suffixes. Remember, suffixes go at the end of a base word. Derivational suffixes are very common, but change the meaning of a word and its part of speech. For example, "I will converse with you about what we will learn." Converse is a verb here meaning to talk. However, "we will have a conversation." Converse with the suffix -ation becomes a noun, the subject of the sentence. Today, we will focus on -ance and -ation, both meaning "the state or condition of."

Teaching of Concept:

      Teacher: " If I say I am going to start construction on a house, what does that mean to you?" (answers will vary, but likely produce answers that involve going away to somewhere else.

      Teacher: The base word for construction is construct. When you construct, it means you build something. If you build something, you are constructing something. Construct acts as an action, or verb. When I add the suffix -ation, this changes the part of speech to mean a noun, or the subject of a sentence. If you said, "The builders are starting construction on my home." It still means they are building your home, it is not the action they are taking, yet the act of constructing.

"When you see the word construction, you can notice -ation, giving you a clue that this will mean the act or condition of a verb. After you notice this, look at the beginning to decode con-struct.

"Let's write -tion at the end of construct. Write the word construction. Underline the base word and box the affix. Remind students that these may overlap.

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Appendix H: Teacher Survey

On a scale of 1-5, one being very confident, 5 meaning not confident at all, answer the following

questions.

1.___The student can easily understand what is read in class.

2. ___The student can find the meaning of unknown words using context clues.

3.___The student can identify morphemes, or meaningful parts of words.

4.___The student feels confident in their ability to do well in my classes.

5.___The student feels confident in helping others to understand what we read in class.

6.___The student looks forward to learning new concepts and ideas in class.

7.___The student understands content and does well in my class.

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Appendix I: Additional Morphology Resources:

Morphology Detecting:

Create word banks that contain morphemes students have been taught. Have students work with partners to identify base words and affixes. Students can discuss and define together as peer work.

Identifying Morphemes:

Create word banks that contain both base words and multimorphemic words. Have students observe words and read them. Then have students underline base words and box the affixes.

Word Morphology Matrix:

These can be adapted during each component to use as additional support/partner work. Educators can create a morphology matrix for students and construct morphological complex words together. Seeing morphemes and putting morphemes together to create words reinforces decomposition of words and breaking apart of words to construct meaning.

http://www.neilramsden.co.uk/spelling/matrix/temp/index.html?fbclid=IwAR2j17rg2wYQZfoto9xNDLU bWB4ZvjB9qMgcO71jYjRYIcMEBp2SSd89014_aem_AYmGG88MqxuHR0NmZkUx2BfNMqu7DVN2 QutnVZvMvXVaNpfwiXJ246pteNCkg1IdYSY

Semantic Word Mapping

1) Select a short passage that contains a word using semantic morphemes.

2) State the purpose of today's lesson to students. "Today we are going to read a short passage with a multi-morphemic word. We will break apart the word into morphemes, make connections with other words we know, and try to discover the meaning of the unknown word."

3) Provide semantic maps (semantic map templates can be found online or made), and write the target word for students.

4) Students will write the sentence that contains the target word from the passage.

5) Break the word into meaningful word parts. For example:prescription pre-script-ion

6) Brainstorm as a group, words that contain similar morphemes. ex: scripture

preheat, manuscript… Write the words on your map.

7) Make predictions as a group of what the word may mean. Write down your prediction on your map.

8) Look up the definition and write it on your map.

9)Discuss as a group. What did you get right? What was confusing? Can you think of any words now?

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