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# How Should Context-Dependent Words Be Taught to Beginning Readers?

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READERS?

by

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A dissertation submitted to the Graduate Faculty in Educational Psychology in partial fulfillment

of the requirements for the degree of Doctor of Philosophy, The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in
Educational Psychology in satisfaction of the dissertation requirement for the
degree of Doctor of Philosophy.

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ABSTRACT


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This study examined three different instructional methods for teaching beginners to read context-dependent words. Two types of context-dependent words were taught: irregular past tense verbs and function words. The words were embedded either in scrambled contexts or in meaningful sentence contexts. Three different instructional conditions to teach the words were compared. In the Meaningful Context condition, students studied the target words embedded in meaningful sentences. In the Scrambled condition, students studied target words placed in scrambled word sequences. In the Combination condition, students studied target words in both types of contexts that were alternated across learning trials. Participants were 53 pre-kindergarten and kindergarten students, ages 5 to 6 years, who qualified as beginning readers based on pretests. The two word types were read on separate training days, with two sets of posttests administered a day after each training session. Posttests included measures of sight word reading, spelling, sentence production, irregular past tense verb transformations, and syntactic awareness. It was hypothesized that instructional condition would affect the word identities that were learned. Results showed that instructional condition did not affect word reading measures during training or on any of the posttests. It was also hypothesized that function words would be easier to learn across measures. Results

showed that function words were easier to read and spell, while past tense verbs were easier to embed in sentence contexts. Findings carry instructional implications for how to teach context-dependent words to beginning readers.

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Chapter I

**Introduction**

Beginning in kindergarten, children are expected to learn to read high frequency, context-dependent words whose meanings are activated by other words accompanying them (NYSED, 2011). The new Next Generation Learning Standards expect kindergartners to be able to read some of these high frequency words by sight (NYSED, 2017). It is important to identify effective instructional methods that enable children to read these small, but frequent and useful words. Having a store of sight words that can be read automatically from memory frees up cognitive resources and enables readers to attend to and comprehend the meanings of sentences and text. The current study tested different instructional methods to determine how best to teach context-dependent words to beginning readers. This study assessed the impact of instruction on sight word acquisition, spelling, and semantic and syntactic awareness of target words.

Word identity theory states that a sight word is stored in memory as an amalgam of multiple identities of that word. The identities include phonological, orthographic, semantic, and syntactic information (Ehri, 1998; Ehri & Wilce, 1980). The phonological identity of a word is the way it is pronounced. The orthographic identity of a word includes its letter components and their order. The semantic identity of a word contains its meaning and how it relates to other words' meanings. Finally, the syntactic identity of a word is how it is used in a sentence and the function it serves. Previous research has shown that the conditions in which words are studied affect the types of word knowledge that are learned.

Context-dependent words are words whose meanings are more abstract than context-independent words. Context-dependent words require context to activate and communicate their full meaning. In the current study, two subtypes of context-dependent words were examined: irregular past tense verbs and function words. Function words have been identified in previous research as conjunctions, prepositions, relative pronouns, and auxiliary verbs (Ehri, 1976; Ehri & Wilce, 1980). Irregular past tense verbs involve pronunciations and spellings that differ from their present tense forms (e.g., KEEP/KEPT) and only appear in sentence contexts.

Context-dependent words that are presented and studied out of context, for example, in a list of semantically unrelated words or in isolation on flash cards, present an obstacle for learners. Without contextual support, the reader is asked to learn the word using limited lexical information. The presence of context enables the reader to gather clues about the words' meanings and syntactic identities. Word study methods, such as using flashcards to practice single isolated sight words, necessarily omits vital components for acquiring all the possible word identities.

A study by Ehri and Roberts (1979) supported word identity amalgamation theory and the idea that different instructional methods yield different types of word learning for beginning readers. Researchers taught first graders to read words either in printed sentences or in isolation on flash cards. Posttest performance showed that children who studied the words in context learned more about the words' semantic identities, while children who studied words in isolation could read the words faster and learned more about the words' orthographic information.

Ehri and Wilce (1980) examined children's learning of function words using two types of instructional methods. Half of participants studied words in meaningful printed sentences and half of participants studied target words within a list of words and heard the sentences. Results showed that the format in which children learned the words affected what they learned about the words. When words were studied in printed sentences, children learned more about their semantic and syntactic identities. When words were studied in a list, children learned more about their phonological and orthographic identities.

Ehri (1976) compared readers' and prereaders' abilities to learn context-independent versus context-dependent words over trials in a paired associate learning task. Children in this study heard target words embedded in spoken sentences or heard them spoken aloud in isolation. No spellings were shown. Results showed that words accompanied by meaningful sentence contexts did not help word learning. Also, context-independent words (i.e., nouns and adjectives) were learned faster than context-dependent words.

Miles (2015) examined different instructional methods for teaching content words and function words with native and non-native English speakers. Among native speakers, she found that children were better able to read and spell target words that were taught in isolation. However, children were better able to produce correct novel sentences when the words were taught within a meaningful context. Context-independent words were easier for children to read, spell, and use in the production of new sentences than context-dependent words.

Three instructional conditions were compared in the current study to teach beginners to read two types of context-dependent words. The instructional conditions included a meaningful sentence condition, a scrambled sentence condition, and a combination condition. In the Meaningful Context condition, students practiced reading the target words in multiple meaningful sentences. In the Scrambled Context condition, students read the same words that appeared in the meaningful sentences, but the words were scrambled to eliminate the syntactic and semantic information that could be gleaned from the surrounding words to activate target word meanings. This condition was regarded as the equivalent of the "no context" or isolated word learning conditions used in previous studies. Embedding target words in scrambled contexts was done to control for target word exposure time. The combination approach combined the two conditions by using each method on alternating trials. Two subtypes of context-dependent words were compared, past tense verbs and function words.

Children's ability to read target words was assessed at the beginning of each test trial during training and was followed by practice reading the words in one or the other type of context. A day after training, posttest measures included a flash word identification test to assess sight word acquisition, a spelling test to assess orthographic memory for the target words, a sentence production task to assess semantic and syntactic identity acquisition for each target word, a verb transformation task to determine if the function of the irregular past tense verbs was taught, and a syntactic awareness task to assess children's acquisition of the syntactic identity of each target word.

The research questions that were explored by this study are:

1) Do the three instructional approaches impact word learning performance differently as shown on posttest measures of sight word reading, orthographic memory, semantic knowledge, and syntactic knowledge for the target words?

2) Does teaching children to read context-dependent words in a context without meaning enhance their ability to read and spell those words better than teaching them in meaningful sentences?

3) Does teaching children to read context-dependent words in meaningful sentences enhance their knowledge of the semantic and syntactic identities of the words better than teaching them without meaningful contexts?

4) Does teaching context-dependent words in the condition that combines meaningful and scrambled contexts produce better learning outcomes than teaching the words in either the meaningful context condition or scrambled context condition alone?

5) Are word identities of function words learned differently from the word identities of irregular past tense verbs in any of the three instructional conditions?

Chapter II

**Literature Review**

The reading and writing standards for young children in the United States are becoming increasingly demanding. Education standards outline expectations for children at several points in the academic year. The Common Core Standards Initiative, which has been adopted by forty-one states and Washington, D.C., identifies end-of-year expectations for grades K-12 in literacy and mathematics (CCSI, 2015). The New York State Common Core learning standards assert that, by kindergarten, children should be able to read some high-frequency words by sight (NYSED, 2011). Many of these high-frequency words are context-dependent words and the methods by which they are taught to children may have a strong impact on their word learning and retention.

**Context-Dependent Words**

Context-dependent words are those words whose meanings are not fully activated when presented in isolation. Their meanings are lodged primarily in their function, that is, their relationship to other words in sentences. Two subtypes of context-dependent words are past tense verbs and function words. Function words may be prepositions, conjunctions, auxiliary verbs, or relative pronouns (Ehri & Wilce, 1980). Context-dependent words can be more difficult to teach because their meanings are more abstract when compared to context-independent words. Fully activating the meanings of context-dependent words requires the presence of other words within a phrase or sentence. Enabling beginning readers to recognize the meanings of these words may require embedding them in a meaningful context. The purpose of the current study was to

analyze the effectiveness of different instructional methods to teach two subtypes of context-dependent words.

**Context-dependent versus content words.** Context-dependent and content (context-*in*dependent) words differ in their potential to evoke meaning when presented as isolated words. Words that have more obvious meanings when presented in isolation, like nouns and adjectives, are referred to as content, or context-independent words. These words refer to specific entities or properties, or describe experiences and thoughts (Weber, 2006).

Holden and MacGinitie (1972) interviewed kindergarteners to find out how easily they distinguished the different types of words within sentences. In this exploratory study, they instructed the children to tap on a series of poker chips to signify each separate word. A comparison of the different types of words that children were able to isolate showed that identifying content words was easier than function words. In many instances, children combined smaller function words, like *to*, with other words, as in *have to* (You/haveto/go/home) or *to eat* (The/dog/wanted/toeat/). They also found that children had difficulty with print conventions involving word separation. Apparently, the children's conception of separate printed words was a reflection of the structure of their speech, and not of the writing system.

Miles (2015) assessed native and non-native English speakers' ability to learn content versus function words using flashcards. Across posttests that included isolated word reading, spelling, and sentence production, native speakers performed better with content words compared to function words. This suggests that function words give beginning readers more difficulty, perhaps due to their abstract nature. An additional

finding in this study regarding word type was that three sessions of an orthographic mapping treatment prior to the flashcard word learning session showed benefits to students' content word learning in the flashcards with sentences. This suggests that function words may be at a disadvantage when read within sentences because they do not have clear meanings on their own.

**Lexical awareness.** The ability to identify lexical boundaries is a vital step in building a sight vocabulary. Implicit lexical knowledge that children gain through speaking soon becomes explicit or conscious knowledge when they begin reading instruction. Ehri (1975) compared the lexical awareness of prereaders and readers. She found that readers outperformed prereaders on multiple tasks, including segmenting spoken sentences into words and syllables, using grammatically complex words in new verbal sentences, and identifying small changes in single words between two similar sentences. Results showed that prereaders often did not identify function words as separate words, even when spoken in isolation. These findings suggest that readers' exposure to print made them more aware of words as units of language and able to gather syntactic information from features that are otherwise invisible in speech. Word consciousness is a necessary step for recognizing context-dependent words that are often ambiguous in conflated spoken language.

Morris (1993) describes the establishment of concept of word as a "pivotal event" for novice readers in word identification. In a longitudinal study, which included two instructional reading conditions in kindergarten, children's concept of word development was analyzed through assessments to determine the sequence in which the component skills develop. Concept of word in text was operationalized as "the ability to match

spoken words to written words in reading a memorized sentence" (p. 148). To assess this construct, a researcher read a simple sentence to a child, and in the second reading of the sentence, the child was asked to finger-point to the words as they were read. Morris determined, with a 90-91% adherence rate, that children progress through this concept of word skill starting with the formation of beginning consonant awareness, then concept of word in text, followed by phoneme segmentation ability, and finally, word recognition. Morris concluded that the instructional implication of this developmental sequence is that a stable concept of word in text should be established prior to asking children to discern individual sounds within words (segmenting phonemes). As children develop early phoneme awareness, identified as consonant awareness, in combination with the ability to detect word boundaries, they can engage in basic finger-point reading. The current study utilized a finger-point reading task to ensure that readers attended to individual words within each instructional condition.

**Function words.** Weber (2006) outlines the difficulties readers encounter while learning to read function words like prepositions and conjunctions. A preposition or prepositional phrase must be used with a noun or pronoun, to show a relation with that noun or pronoun expressing direction, location, or time. Conjunctions are words that connect clauses or ideas within a clause. These roles within language make them more difficult to discern because they become weakly stressed syllables as part of phrases. If children cannot identify them as distinct words, then this hinders their ability to ultimately recognize the word in print. Their functional role also affects their vowel quality, as weakly stressed vowels in syllables are pronounced as schwas. This type of vowel sound is difficult for beginning readers to spell because of its many alternative

orthographic representations. Additionally, in casual speech, consonants are sometimes dropped from unstressed syllables in phrases (e.g., *gonna* for *going to*, '*em* for *them*).

As Weber (2006) points out further, children may be taught to read function words in isolation, where their individual phonemes are overemphasized and clearly pronounced. However, this is usually not an accurate representation of how the word is pronounced when embedded in meaningful speech. The difference between hearing the word in isolation and hearing the word embedded in meaningful speech may contribute to beginning readers' confusion regarding function word identities.

Two experiments by Stuart, Masterson, and Dixon (2000) investigated the relationships between early literacy skills, teaching methods, and word-type learning with five-year-old-readers. In the first study, they attempted to teach sight word vocabulary through context only. Half of the target words were function words and half were nouns. Children were exposed to 16 different written target words while they were read storybooks, through nine read aloud sessions, with a total of 36 exposures per word. It should be noted that all words were at least five letters long, and half were spelled regularly while half were spelled irregularly. The researchers make a point to explain that these seemed to be appropriate words for this sample of children. At the end of training, in general, children did poorly on word recognition tasks (a mean of 4.95 out of 16 words read correctly). However, there was a significant effect for word type, with nouns being easier to read than function words. Function words were not further subcategorized.

**Irregular past tense verbs.** Irregular past tense verbs may also present a special challenge to beginning readers. When these words are seen or heard in isolation, activation of their meanings is especially problematic because they differ phonologically

from their present tense forms. For example, the word HELPED is a regular past tense verb. It follows a common rule for forming the past tense. HELPED is also phonologically much closer to its present form HELP than TOOK is to TAKE. Irregular past tense verbs, like TOOK and CAME, do not utilize the general rule of adding the "-ed" at the end of the present tense form.

Children are also much less likely to hear past tense verbs in isolation (or in two-word phrases) compared to present tense forms. It is common for children to hear, "Come" or "Hold it," while they would rarely encounter the phrases, "Came" or "Held it." These verbs are typically spoken within the context of a full sentence. This might negatively affect a child's ability to learn them outside of a sentence context during reading instruction.

Berko (1958) found that children between the ages of 4 and 7 have great difficulty with irregular past tense verbs. One part of the study gave children novel verbs (i.e., verbs created for the experiment) in the present tense and asked them to verbally produce these verbs in the past tense. The word RING was also used to assess children's familiarity with its irregular past tense form, RANG. Results showed that preschoolers had the most difficulty with RING/RANG, with 0% of the 19 preschool participants producing a correct response. Among the 5-7-year-old participants, 25% produced the word RANG. For the past tense transformation of novel verbs, children should have applied the general "–ed" rule. Preschoolers were successful 14-72% of the time and the older children were successful 31-85% of the time. These results show that kindergarteners are still mastering strategies for forming past tense verbs, and irregular past tense verbs are particularly difficult.

According to the Corpus of Contemporary American English, past tense verbs occur much less frequently in American speech and print (Word and Phrase Frequency List, 2012). Two of the chosen past tense verbs in the current study have frequency ranks below 60,000: HELD (31,685) and KEPT (33,938). However, four of the six chosen past tense verbs do not appear in the frequency ranks below 60,000. On the other hand, the function words that were chosen rank well within the top 150. The order of frequency rank for the chosen function word list is WITH (16), BUT (23), FROM (26), INTO (65), DOWN (118), MUCH (146). The vast discrepancy between the frequency ranks of the chosen target words suggest that function words would be easier to learn than past tense verbs.

Context-dependent words can be categorized according to their utility, as described above. The grammatical functions of these words are varied, so certain types may be learned differently by beginning readers. The current study focused on two types of context-dependent words, irregular past tense verbs and functions words. Past research comparing context-dependent words and context-independent words has not differentiated between the different categories of context-dependent words. Ehri and Wilce (1980) and Miles (2015) conflated past tense verbs into the same category of function words with prepositions, conjunctions, and auxiliary verbs. Function words may have an advantage for beginning readers because they are encountered more frequently in reading and speech than irregular past tense verbs. The methods in the current study attempted to determine if one type is learned differently from the other.

**Word Identity Theory**

The development of a sight word vocabulary is integral for fluent reading. Words that have been read before can be recognized automatically from memory, by "sight" (Ehri, 2014). Accessing sight words from memory frees up cognitive resources so that the reader can attend to comprehension processes. According to Ehri's word identity theory, a sight word is learned when the spelling of a printed word is stored in memory, activating the pronunciation and meaning simultaneously, creating a stored amalgam (Ehri, 1998; Ehri & Wilce, 1979). The lexical amalgamation is composed of phonological, orthographic, semantic, and syntactic information. A recurring routine of pronouncing printed words while connecting their spellings, pronunciations, and meanings within sentences effectively forms this amalgamation in memory (Ehri and Wilce, 1980).

**Semantic identity.** This theory asserts that learning to read words is not simply the process of decoding a printed word. Readers must also learn what words mean and how to properly use them in context. A word's meaning and its relation to others words and ideas associated with it are contained in its semantic information, or semantic identity. Traditional vocabulary exercises emphasize semantic information through the memorization of definitions and use in sentences. Other methods of teaching semantic information can include analyses of morphemic components and contextual information (Nagy & Scott, 2000). Semantic information can also be gleaned from context cues surrounding the words in a sentence. With knowledge of a language's syntax, a listener can determine if an unknown word is an action, a descriptor, or maybe a person or thing.

**Orthographic and phonological identities.** Orthographic information consists of the identities of letters and their order within a word. Readers accumulate this knowledge after gaining an understanding of the alphabetic principle and being exposed to specific word spellings and spelling patterns. Phonological identity is the word's pronunciation or how it is said in natural speech or when it is read aloud. Share's (1995) self-teaching hypothesis describes how phonological recoding, that is, blending letter-sound correspondences to pronounce unfamiliar words contributes to readers' orthographic knowledge. The process of phonological recoding acts as a self-teaching mechanism to strengthen the reader's word-specific and general orthographic knowledge.

Nation, Angell, and Castles (2007) examined orthographic learning of nonwords in 8-9-year-old English learners. In their context condition, researchers exposed children to the 4-letter target nonwords within the context of a short story. In their isolation condition, the children were exposed to target nonwords on cards, placed among other cards containing words and nonwords. In both conditions, participants were exposed to some of the target nonwords once, some twice, and some four times. Results showed that four exposures to target words significantly benefitted orthographic learning compared to fewer exposures. Also, they found that exposure to nonwords in a meaningful context did not improve orthographic learning of those words compared to isolated exposure. The researchers claim that these results may not challenge Share's self-teaching hypothesis. It claims that contextual cues combine with partial decoding to more accurately read words. However, when the words are unfamiliar meaningless nonwords rather than familiar spoken words,  there is no benefit to be derived from a meaningful context.

It should be noted that the nonwords used in Nation, Angell, and Castles (2007) were presented as nouns (context-*independent* words) within the stories the children read, and word class was not manipulated. The degree to which a word's meaning and use depend on context may affect the way it is processed in and out of context. Homographic spelling patterns, where a spelling pattern has more than one phonological representation, present an additional hurdle for beginning readers because they can vary with context. However, readers who have learned to use context to identify unknown words are better equipped to ascertain which alternative pronunciation fits their sentence (Tunmer, Herriman, & Nesdale, 1988). The current study attempted to compare placement of context dependent words in meaningful sentences versus scrambled sentences to examine the acquisition of real context-dependent words for beginning readers. Measures also assessed different types of word knowledge learned during training, including orthographic learning.

**Syntactic identity.** Knowledge about the structural features of language is known as syntactic knowledge (Foorman, Herrera, Petscher, Mitchell, & Truckenmiller, 2015). The placement and function of words in sentences and their relationship to the function of other words entail their syntactic identities. Teaching syntactic awareness can help beginning readers identify unknown words. Combined with partial phonological recoding, understanding syntactic operations within sentences helps to greatly limit the possibilities for an unknown word (Tunmer, Herriman, & Nesdale, 1988).

Foorman et al. (2015) confirmed the contribution of syntactic awareness to listening comprehension with readers in kindergarten through the second grade using latent variable analysis. Measures of syntactic awareness used were Sentence Structure

and Recalling Sentences subtests from the Clinical Evaluation of Language

Fundamentals- IV (Semel, Wigg, & Secord, 2003). Performance on these two subtests

correlated significantly with the Gates-MacGinitie-4 (MacGinitie, MacGinitie, Maria,

Dreyer, 2000) listening comprehension subtest ($r$ = .41 for sentence structure, $r$ = .43 for

recalling sentences) and two narrative passages from a Florida state reading assessment,

the FAIR ($r$ = .57 and $r$ = .47 for sentence structure and $r$ = .47 and $r$ = .51 for recalling

sentences) for kindergarteners. Using structural equation modeling, researchers were able

to determine that listening comprehension in kindergarten is significantly predicted by

oral language (which included the measures for syntactic awareness, listening

comprehension, and vocabulary) and phonological awareness, and these factors account

for 30% of the variance in comprehension. Another common method for assessing

syntactic awareness is with a sentence anagram task. Children are given a cut-up sentence

and asked to order the words so the sentence makes sense (Weaver, 1979).

      Ehri and Roberts (1979) taught homonyms to first graders using two different

methods of word learning. One group read target words embedded in printed sentences

while another group studied the words printed in isolation on flash cards while listening

to the sentences. In this experiment, readers had to utilize the unique spellings to activate

one or the other of the two meanings because the pronunciations were identical (e.g.,

rows, rose). Findings suggested that reading words in meaningful sentences was

beneficial for learning unique meanings of the words, whereas studying the words in

isolation while only hearing the sentences was beneficial for learning the word's

orthographic features.

This study supports amalgamated word identities because the particular word learning experiences directly affected the information that was learned about the identities of words.  If children were exposed to the spellings of the words within sentences, they attended primarily to their semantic and syntactic identities. This phenomenon may occur due to readers' automatic comprehension processes that attempt to draw meaning from a series of words. In attending to all the words in a sentence, the reader is left with fewer resources to focus on the orthographic makeup of each word. Hence, in this study when children were exposed to the words in isolation and only heard a spoken sentence, they attended primarily to the spelling, while the semantic and syntactic identities were less fully processed.

**Word Reading Strategies**

When words have not been read before and are not part of a reader's sight word vocabulary, the reader must engage in print strategies. Ehri (1998, 2014) outlines three strategies that readers might employ to decipher new words. One way is to use decoding skills. This requires the reader to blend letter-sound or grapheme-phoneme correspondences to form recognizable words.

Secondly, a reader can use analogies to known words. This requires the reader to access the spelling of a familiar word sharing letters with the unfamiliar word and adapt it to read the unknown word, for example, reading *stump* by analogy to *bump*. Ehri and Robbins (1992) found that this works in combination with decoding, as the reader usually has to combine adjacent letter-sound correspondences with the known (analogized) word parts.

A third strategy for reading unknown words is to use context to predict words. This requires that readers utilize their background knowledge and previous information from the text or sentence to make a prediction about what the unknown word might be. This strategy is usually the first that children learn to use, especially when pictures accompany words in books. Unfortunately, these guesses can often be inaccurate if the child is making no use of letter-sound correspondences. However, if the child learns to use prediction in combination with the other word reading strategies, this greatly increases accuracy. Stanovich (2000) reports on his own research suggesting that poorer readers, those with insufficient decoding skills, more often use context to determine unknown words. In the current study, it was hypothesized that when provided with words embedded in a meaningful contexts containing semantic and syntactic information, beginning readers would use this information to recognize and read the unfamiliar written words. They would outperform beginning readers who were provided with the same words embedded in scrambled word contexts providing no semantic and syntactic information.

**Instructional Methods for Word Study**

The current study attempted to shed light on aspects of instruction that would make context-dependent-word learning more effective for beginning readers.

**Flashcard learning.** Instructional methods in the current study included a flashcard task guided by a researcher. Flashcards are a common tool used by teachers for teaching sight words. The flashcard method of studying words is a routine in which the instructor presents the flashcard, allows for a response by the reader, then delivers a consequence, such as corrective feedback. Miles, Rubin, and Gonzalez-Frey (2017)

documented some ways that kindergarten teachers approach sight word instruction. One common method incorporated flashcard exercises after an initial presentation and before placing them on a word wall. The researchers explain that teachers often treat sight words as if they must be memorized. Flashcards are a common approach because they allow for repeated exposure and feedback while viewing the words as a single unit. However, the researchers also recommend teachers point out grapheme-phoneme relations during their sight word lessons.

Volpe, Mulé, Briesch, Joseph, and Burns (2011) compared two types of flashcard word instruction, traditional drill (TD) and incremental rehearsal (IR). In both conditions, a total of twelve unknown words was introduced on flashcards over the course of four sessions. In the TD condition, only the unknown words were shown on flashcards and in the IR condition, the unknown words were interspersed with known words. The two conditions were administered in two ways: one holding constant opportunities to respond, the number of times when the child practiced the target words, and another holding constant total intervention time. Instructional methods were assessed for effectiveness, the cumulative number of words read accurately the next day, and efficiency, the cumulative rate of words learned. The sample was quite small, consisting of four first graders, but the investigation parsed out benefits to both methods. Results showed that when opportunities to respond were equal, the TD method was more efficient than IR, with learning rates between 3 and 6 times higher in TD than IR. Under this administration, the IR condition took almost four times longer to complete ($M = 23.98$ min per student) than the TD condition ($M = 6.77$ min per student). When instructional time was held constant, the effectiveness rates were similar between the conditions. The

researchers concluded that there may not be a one-size-fits-all approach to flashcard word learning. The current study presented only unknown words for study during training similar to the TD training in Volpe et al.  Results of the Volpe et al. study suggest that the incorporation of known words, as recommended by an IR flashcard method, add unnecessary length to word study training. The training procedures of Volpe et al. included three minutes of flashcard intervention in each of the eight total sessions. The sum of 24 minutes of isolated flashcard reading is estimated to be similar to the current study's instructional time on flashcards for all twelve target words.

**Isolation versus context.** Isolation word learning conditions in the following studies are similar to the flashcard approach, where contextual information is limited.

Ehri (1976) compared two instructional methods to teach content and context-dependent words to kindergarteners and first graders. Words were taught either in a "context" condition, where children heard the word embedded in a sentence, or in a "context-free" condition, where words were spoken aloud in isolation. A paired associate learning task was used. The words included content words (nouns and adjectives) and context-dependent words (prepositions, auxiliary verbs, conjunctions, past tense verbs). Each word was paired with a distinctive meaningless line drawing. In one condition, children heard the word embedded in a sentence context whereas in the other condition no sentence was given. Across several learning trials, the line drawings prompted oral recall of the five words, with corrective feedback provided to enhance recall on subsequent trials. Examples of the words learned in one set are: content words: *box*, *fast*; context dependent words: *at*, *helped*, *could*. Participants were trained on target words until reaching two errorless trials or when 30 minutes had elapsed. Findings showed that

content words were learned more rapidly over trials than context-dependent words. Also, exposure to oral sentence contexts did not facilitate learning. When the performance of prereaders was distinguished from children who had learned to read, results showed that prereaders had much greater difficulty learning context dependent words than content words whereas readers had only slightly more difficulty. This further underscores the opacity of function words, particularly to younger nonreaders.

A study by Ehri and Wilce (1980) looked specifically at how children's learning of function words would be affected by the methods used to study them. One half of the children were assigned to a "context" condition, in which they learned to read the target words embedded in meaningful sentences. The other half of the children was assigned to an "isolation" condition, where they learned to read the target words in lists. Posttests assessed the effects of each word study method. As predicted, they found that children who learned the target words in meaningful sentences performed better on measures of semantic and syntactic knowledge about the words. Also, as expected, the children who learned the words in lists, without context, performed better on measures of orthographic knowledge about the words. These results also support word identity amalgamation theory in that information about words and their identities are directly affected by the mode by which they are studied.

Miles (2015) examined the effects of two different instructional methods of word study and word class on beginning reader's ability to read, spell, and properly use the words. This study's sample included both native and nonnative English speakers. Children were taught to read target words either in isolation or in sentences. Word class was defined as either content or function, though the function words were not further

grouped into more specific subcategories. For native speakers, learning words in isolation was more beneficial for isolated word reading and spelling than was learning the words embedded in sentences. However, for both native and non-native speakers, learning words embedded in sentences significantly improved the children's abilities to use the words in semantically and syntactically correct sentences. The procedures did not equate target word exposure. In both the context and isolation conditions, participants saw an isolated word on the first card, then on the second card the word either appeared in isolation or was embedded in a sentence. This methodology likely affected the time participants were exposed to each word, giving an advantage to those in the isolation condition.

In the second experiment by Stuart, Masterson, and Dixon (2000), they compared three instructional methods: flashcard, book, and mixed (presentation of a flashcard before reading the word in a book), using a between-groups design. The target words consisted of only the eight nouns from the first experiment. Children were exposed to each target word 32 times, according to their training condition. Results of this study showed that the flashcard group, shown only the words in isolation, outperformed both the mixed-method group and the book group in context free word reading, comprehension (picture matching), and word reading in sentence context. Analyses between groups showed that the mixed method approach fell between the book and flashcard method on measures of context-free word reading and comprehension. Moreover, calculations of time spent on training determined that the flashcard method needed significantly shorter training time than comparison methods. Researchers concluded that teachers should use isolated presentations of words for the most efficient

sight word learning instruction. However, these analyses compared methods with only

nouns as stimuli. As discussed previously, nouns and their meanings are more salient to

beginning readers and therefore may require different study methods than function words.

Additionally, the flashcard method described in this study would not be fully equivalent

to scrambled context that was examined in the current study. With flashcards, it is

possible that greater exposure time to target words when displayed alone is the reason for

better word reading. The current study also attempted to find out if function words might

be better learned in a combination condition, that combines benefits from the scrambled

and meaningful context presentations.

      **A modified isolation condition.** The current study modified the isolation

condition used in previous studies to improve upon the methodology used to compare

different word study formats. Previous studies used an isolation condition where either

individual target words were presented alone on cards (Stuart, Masterson, & Dixon,

2000; Miles, 2015), individual target words were spoken aloud alone (Ehri, 1976), or

individual target words were presented in lists without context (Ehri & Wilce, 1980).

These methods did not control for exposure time to target words when compared to the

alternative conditions, where target words were read within sentences.

      The current procedures used scrambled sentences as a modified isolation

condition. The scrambled sentences were made up of the same words used in the

meaningful sentences. The scrambled sentences were similar to reading a random list of

words to the participants in that no meaning could be gathered from the string of words.

In the scrambled sentence trials (for the scrambled condition and the combination

condition), the experimenter read the scrambled sentence at the pace of a meaningful

sentence. This method controlled for the amount of time the reader was exposed to and had their attention directed toward the target word. This was an improvement upon previous methodology that compared a sentence/context condition to an isolation condition because, here, only the meaning of the sentence was manipulated. All other factors remained equivalent between conditions. This design attempted to discern if readers gain specific word knowledge based on the manipulation of context, and not exposure time.

**Combination.** A third approach to presenting target words to participants was to combine the scrambled condition and context condition into a combination condition. By combining instructional methods, it was predicted that both methods would contribute to the acquisition of all the identities of words. If readers gather phonological and orthographic information best when a word is presented without context and they gather syntactic and semantic information best when a word is presented in a meaningful context, then a combination condition should provide readers with the most complete lexical information. According to amalgamation theory, this creates more connections to the stored amalgam of the word, making it easier to retrieve as a sight word.

**Phase Theory**

Ehri (2014) describes the development of reading skills as a progression through four phases. The phases are labeled to reflect the extent to which readers have acquired knowledge of the alphabetic writing system. This knowledge includes phoneme awareness, which shares a two-way, reciprocal relationship with learning to read. Phoneme awareness acts as the device through which sight words can stick in memory, as

it allows for the mapping of spellings to pronunciations, and vice versa (Morris,

Bloodgood, Lomax, & Perney, 2003).

In the initial phase of Ehri's developmental reading model, labeled pre-alphabetic,

children are unaware of basic grapheme-phoneme relationships. They do not know that

individual letters represent spoken sound units. Any "reading" they seem to be doing is

the result of memorization of the word as a whole, like their personal names. They can

also pretend to read books because of their memory for stories.

In the second partial alphabetic phase, children begin to understand the alphabetic

principle. They can utilize a reliable system of letter-sound correspondences, even though

their knowledge is limited. Their phonemic awareness skills and ability to segment

sounds in words may be limited to initial and final sounds (Morris, Bloodgood, Lomax,

& Perney, 2003). When asked to invent spellings of words, they use letter names to

represent sounds detected in words.

Miles, McFadden, and Ehri (2019) examined the connection between language

skills, reading phase, and a child's ability to learn function words using flash word study.

The kindergartners that participated were classified into native and nonnative English

speakers, as well as partial alphabetic and full alphabetic phase readers. There were two

separate 15-minute training sessions where children studied twelve target words total,

consisting of six context-dependent words and six content words. Target words

overlapped with three of the current study's past tense verbs, noting that they were first or

second grade level equivalent. Training included four trials, with the first as a study trial

and the following three as test trials that determined word reading ability. They found

that language skills were predictive of function word learning in isolation only for full

alphabetic readers. Additionally, results showed that partial alphabetic readers were not yet able to draw upon language and vocabulary skills when studying words without context. Researchers concluded that teachers should identify the alphabetic skill and reading phase to maximize learning before flash word instruction.

Readers in the partial alphabetic phase build their knowledge as they read both new and familiar words. Their knowledge of letter-sound correspondences allows them to focus on the multiple identities of a word, intuitively forming the amalgam in memory. Readers in the partial phase accumulate partial word identity information, reflected in the types of word knowledge they retain. For example, a child may effortlessly read the word "barn," but when asked to spell it independently, they may respond with "B-R-A-N." In this instance, the child has solidly formed the phonological identity of the word and has a good basis for the word's orthographic identity, but it is not yet fully formed. The current study focused on instruction with children in the partial alphabetic phases. Beginning readers with knowledge of the alphabet but limited sight word vocabularies were expected to benefit most from the word study methods that were examined. Their newly developed ability to form word identities in memory was expected to shed light on how varying aspects of lexical knowledge are acquired. In the third full alphabetic phase, children have a firm grasp of grapheme-phoneme correspondences and they are using this knowledge to build a rapidly growing sight vocabulary. Full alphabetic phase readers form amalgams of words where all the letters in spellings are bonded to their pronunciations and meanings in memory. These readers apply decoding strategies to read unknown words, and they continue to build their sight vocabularies as they are exposed to and decode words in and out of text, decode them, and store their spellings in memory.

A recent study compared the abilities of two levels of readers within the full alphabetic phase, sequential decoders and hierarchical decoders, to read irregularly spelled words in sentences (Murray, McllWain, Wang, Murray, & Finley, 2019). Sequential decoders are children who decode letter by letter, going from left to right in sequence, while hierarchical decoders recognize vowel patterns, like vowel digraphs and silent-*e*. Kindergartners and first graders studied a total of 16 words, 8 under an experimental condition and 8 under a control. The words were familiar to the children but were not high frequency words. For the experimental condition, children were taught to mark a box around unique spelling patterns in order to scaffold mental marking for unknown irregular words. In the control condition, scaffolding was lighter and students were only encouraged to finish the sentence to help figure out the unknown words. Both conditions were encouraged to crosscheck by reading the full sentence. Children's memory for these words was assessed on flash-word reading, untimed reading, and spelling tasks. Results showed that, controlling for level of reader, there was a main effect for treatment condition for untimed reading favoring the experimental condition, but not for spelling or sight word reading. Also, hierarchical decoders outperformed sequential decoders on all measures. Researchers concluded that only the hierarchical decoders of the full alphabetic phase are able to do the mental marking required for learning irregular spelling patterns. Sequential decoders were not able to detect spelling patterns because they moved from letter to letter.

In the final consolidated alphabetic phase, readers are able to use larger letter units to break down multisyllabic words into grapho-syllabic units to read the words. Readers in this phase are aware of the meaning attached to many spellings in English,

allowing them to make relations using root words. Readers in this phase are too advanced to participate in the current study. Their complex knowledge of syllables and larger sight vocabularies would supersede the instructional methods that were used, thus negating its effects on word identity acquisition. Also, they are likely to have already learned to read the context-dependent target words studied here.

Chapter III

**Rationale, Hypotheses, and Overview of Study**

The purpose of this study was to extend previous studies by further examining the effects of instructional method on the learning of context-dependent words. The studies by Ehri and Roberts (1979) and Ehri and Wilce (1980) compared two types of instructional training methods, words embedded in sentences and words printed in isolation. Each method benefitted different identities of the target words. This study modified the isolation condition by using scrambled sentences, compared two subtypes of context-dependent words, and added a third instructional approach where the two methods were combined with the expectation of reaping word learning benefits from both.

This study was designed to improve on methods in previous studies. Ehri and Wilce (1980) taught function words (past tense verbs, auxiliary verbs, prepositions, and conjunctions) in isolation and in context. Their study found that the different learning conditions strengthened different aspects of word knowledge about the target words. The current study built on this design and that of Ehri and Roberts (1979), by using a "scrambled" condition in place of pure isolation. This method was meant to control for participant exposure to target words. In a pure isolation condition where words are presented alone on a flashcard, participants are able to focus solely on a single word and all its letter components. Time spent looking at the target word could confound the word knowledge gains in this design. Perhaps if children in the context conditions had been given additional time to focus only on the target word, they would have shown word knowledge gains similar to that shown in the isolation condition. The combination

condition in the current study alternated trials of exposure to meaningful contexts with exposure to scrambled sentences. The scrambled condition was meant to direct the participant's attention to each word in the sequence, the same way a meaningful sentence is processed, which controlled for exposure time to target words. However, the scrambled condition did not offer a meaningful context. This design attempted to manipulate syntactic and semantic information available by either preserving or violating the grammatical order of the surrounding words.

This study also compared two subtypes of context-dependent words: past tense verbs and function words. It was predicted that all word identities of function words would be easier to learn than past tense verbs because they appear more frequently in American speech and print (Word and Phrase Frequency List, 2012).

And finally, this study added a measure of irregular verb transformations. A pretest assessed whether children in this age group accepted overregularized forms of irregular past tense target verbs as correct. It was re-administered as a posttest to determine whether the acceptance of overregularized verbs was diminished after correct irregular forms of the verbs were studied, particularly in conditions where the past tense forms were learned in meaningful contexts. It was predicted that the tendency to regularize the past tense forms of irregular verbs would decline from pretest to posttest as a result of context training. Performance in this task was also interpreted a measure of syntactic knowledge.

The design of this study was a between groups design with random assignment to experimental conditions. Participants were randomly assigned to one of the three instructional conditions defined by the context of the target words: a meaningful sentence

context, a scrambled sentence context, and a combination condition where both types of contexts were taught. These groups are referred to as Meaningful Context, Scrambled, and Combination. This study used a repeated measures counterbalanced design to compare word types: function words versus irregular past tense verbs. All participants studied both types of words. The order in which the word types were studied was counterbalanced.

The study examined how different methods of word study affect what novice readers learn about context-dependent words. The following research questions and hypotheses were investigated:

1) Do the three instructional approaches impact word learning performance differently as shown on posttest measures of sight word reading, orthographic memory, semantic knowledge, and syntactic knowledge for the target words?
It was hypothesized that the three instructional conditions will impact word learning differently on posttest measures.

2) Does teaching children to read context-dependent words in a context without meaning enhance their ability to read and spell those words better than teaching them in meaningful sentences?
It was hypothesized that children in the Scrambled condition will score better on measures of reading and spelling compared to the Meaningful Context condition.

3) Does teaching children to read context-dependent words in meaningful sentences enhance their knowledge of the semantic and syntactic identities of the words better than teaching them without context?

It was hypothesized that the children in the Meaningful Context condition will score

better on the sentence production and syntactic awareness tasks.

4) Does teaching context-dependent words in the condition that combines meaningful

and scrambled contexts produce better learning outcomes than teaching the words in

either the meaningful context condition or scrambled context condition alone?

It was hypothesized that children in the Combination condition will score better on

measures of reading, spelling, sentence production, and syntactic awareness

compared to children in both the Scrambled condition and the Meaningful Context

condition.

5) Are word identities of function words learned differently from the word identities of

irregular past tense verbs in any of the three instructional conditions?

It was hypothesized that children will score higher on function word assessments of

reading, spelling, sentence production, and syntactic awareness compared to past

tense verbs across all instructional conditions.

Chapter IV

**Method**

**Participants**

Participants were 53 novice readers selected to be in the partial alphabetic phase of development (see Table 1). They were able to name most lower-case alphabet letters but had limited sight word vocabularies. The sample included 19 boys and 34 girls. All children who were screened for participation turned in a parental informed consent form to their teacher (see Appendix A) and then completed a Child Assent form with the researcher (see Appendix B). Children were recruited from pre-kindergarten and kindergarten classes in public and private schools in a large metropolitan city. Twenty-eight children were attending public schools and 25 children were attending private independent or private parochial schools at the time of data collection. Specific birthdates were not collected from all children, but all ages ranged from 4-5 years. Two children were at the end of their PreK year (i.e., March and June) and 51 children were in kindergarten during the fall, winter, or spring at the time of data collection. Non-native English speakers were identified by teachers and excluded from this study because previous studies have found that they acquire English words differently (e.g., Miles, 2015).

Eligible students were screened in waves as they submitted signed permission forms (see Appendix C for scripts). Groups of 4-10 students were screened from a single grade level and then rank-ordered by scores on the word ID screener. Consecutive blocks of three participants were formed. Members were randomly assigned to the three instructional conditions by using the List Randomizer on Random.org. Any remaining

qualified participants from each grade were randomly assigned to conditions individually.

After instructional conditions were assigned, each block of three was then randomly

assigned to one of two word-type orders using the True Random Number Generator on

Random.org. In other words, all three participants in a block began training with the same

word type, either function words or verbs, in the first training session, and then were

trained with the other word type in the second training session.

**Table 1**

*Demographic Data of Sample*

| | Instructional Condition | | | |
| | Scrambled $n$=18 | Context $n$=18 | Combination $n$=17 | Total N=53 |
| --- | --- | --- | --- | --- |
| School Type | | | | |
| Public | 10 | 8 | 10 | 28 |
| Private Independent | 1 | 2 | 1 | 4 |
| Private Parochial | 7 | 8 | 6 | 21 |
| Grade | | | | |
| Prekindergarten | 1 | 1 | 0 | 2 |
| Kindergarten | 17 | 17 | 17 | 51 |
| Gender | | | | |
| Male | 5 | 7 | 7 | 19 |
| Female | 13 | 11 | 10 | 34 |

**Screening.** The sample of children in this study was selected to be in the partial

alphabetic phase (Ehri, 2014). In order to qualify, children needed to identify at least 18

of the 25 lower case letters in the Letter ID task. If a child could not say the name of the

letter or the sound it makes for at least 18 letters, they were dropped from further

participation. Additionally, in order to qualify, children could read no more than one of

the twelve target words that were part of the study.

**Disqualified participants.** Using the above screening method, 46 children were

disqualified from further participation. All children who submitted a parent permission

form were screened for participation. Children were disqualified at the screening phase

for one or more of three reasons: 1) they were not able to name at least 18 letters (7

children dropped), 2) they were able to read 2 or more of the target words (31 children

dropped), or 3) they were not cooperative with the researcher (8 children dropped). Four

participants completed the study but were dropped from data analyses because of

amendments to study procedures that happened after these four children had already

begun the study. The change in study procedures reduced the word study trials from eight

to four.

**Missing data.** Two participants did not complete the study's procedures due to

absences.  These participants missed both instruction and posttests days for past tense

verbs. However, their complete data for function words was included in some of the

analyses.

**Screeners and Pretests**

**Letter ID.** In this task, children were asked to identify letter names and/or their

sounds. There were 25 lower case letters presented (see Appendix E). The letters q, x,

and z were left out because these letters are infrequent and do not occur in the target

words. Two fonts of g and a (serif and sans serif) were presented in the array. Children

qualified for participation if they could correctly identify 18 of the 25 letter sounds *or*

letter names, as both of these are relevant to decoding ability.

**Word ID.** Children who successfully completed the letter-naming task were

asked next to identify words. They were shown a list of 27 real words and nonwords,

each presented individually. This list included the 12 target words for this study, and in

addition, 10 high frequency words, and 5 nonwords. The additional high frequency words

were selected by the researcher from the pre-primer Dolch word list (Dolch, 1948). Four

of the nonwords were created by replacing the first letter of four words from the primer

word list (e.g., YES-FES, HAVE-BAVE, GID-DID, GET-HET). And the fifth nonword

was created by replacing the first letter in GIRL to make TIRL in order to add variety to

the existing letter patterns in the word list. Words and nonwords were mixed randomly

for presentation. The list was presented as a timed PowerPoint presentation, where words

were displayed on screen for 0.5 seconds. Participants who successfully read *more than*

*one* target word were excluded from the study. Scores were calculated using raw scores

of correctly read words/nonwords, out of a total score of 27. Cronbach's alpha reliability

was 0.65. (See Appendix F for list of words and nonwords.)

**Spelling.** An abbreviated version of the Developmental Spelling Assessment

(Ganske, 2013) was used to assess children's phonemic awareness and ability to write

individual letters. Eight words were used in this spelling screener, five words from the

Letter Name list WIN, GRAB, BET, MUCH, DISH and three words from the Within

Word Pattern list, FEAR, YAWN, and SMOKE (see Appendix G). Responses were

scored for number of correct letters (31 total) and number of whole words (8 total)

spelled correctly. The internal consistency alpha reliability on letters correct was .84.

Only two children spelled one word correctly and the remainder scored zero, indicating

high reliability.

**Verb transformations.** This task was intended to determine children's familiarity

with the past tense verbs selected as target words. The task was modeled after Berko's

(1958) "wug test," where the children provided a response to complete a sentence read by

the researcher. However, this task was modified to be less demanding of children and did

not require them to complete the sentence on their own. They were given two choices orally and asked to choose the correct form of the target verb. They were not shown the spellings. The researcher explained that participants would hear about something a person likes to do "sometimes," using the infinitive form of the target verb. Then, the researcher would present two options about what that person did "yesterday." One option was the correct past tense form of the verb and the other option was an identical sentence using an incorrect past tense form of the verb (see Appendix C). The incorrect past tense form for all target verbs was created by applying the generalized "add -ed rule" (e.g., TELLED, HOLDED, GETTED, COMED, KEEPED, and TAKED). Participants were asked to choose which option sounds right to them. Scores from this measure were calculated using total correct verb choices for a total pretest score of 6. The order of words in the assessment was randomized using the List Randomizer on Random.org. Cronbach's alpha reliability across the six items was .38. This pretest was repeated as a posttest. The parallel form reliability was .79.

**Instructional Materials, Procedures, and Conditions**

      **Target Words.** The current study's target word list was created by selecting twelve context-dependent target words, divided into two subtype sets. Words were chosen by the researcher from the Dolch 220 highest frequency English sight words list (Dolch, 1948) and the 150 most frequent words in printed school English from the *American Heritage Word Frequency Book* (Caroll, Davies, & Richman, 1971). Words were chosen based on letter length of three to four letters and their word type as a function word or past tense verb. While all the selected function words appeared in both lists, only CAME and GOT appeared in one or both in the correct tense. For the

remainder past tense verbs, four present tense verbs on the Dolch 220 list were used in

their past tense form: KEEP-KEPT, TELL-TOLD, HOLD-HELD, TAKE-TOOK.

Among the selected function words, four of the five function word categories described

by Ehri and Wilce (1980) were used: irregular past tense verbs, auxiliary verbs,

prepositions, and conjunctions. Preference was also given to words that are easily

decoded, based on simple letter-sound correspondences (Adams, 1990). Target word

cards were printed in all lower-case letters.

      **Target Word Sentences.** To teach words in meaningful contexts, target words

were presented in grammatical sentences. To teach words in contexts lacking meaning,

words in the sentences were reordered so that target words appeared in scrambled

sequences (see Table 2 for sequences). In the combination condition, meaningful

sentences and scrambled contexts were taught in alternating word study trials. All words,

both target and non-target, used within sentences and scrambled contexts were the same.

The Scrambled condition was included as a control to examine the contribution of a

meaningful sentence that provides the reader with syntactic and semantic information

about the target word. In the Scrambled condition, the random presentation of words did

not provide this information to the reader. The scrambled "sentences" were typed in all

lower-case letters with no period. Meaningful sentences began with a capital letter and

ended with a period. Each target word was studied in four unique meaningful sentences

or scrambled sequences composed of five words each. The sentences and scrambled word

sequences were grouped into sets (labeled A, B, C, and D), each containing the six target

words of that word type. To control for target word exposure, all sentences contained

each target word only once. The target word did not appear as the first word or the last

word in any of the sentences.

**Table 2**

*Sets of Meaningful Sentence Contexts and Scrambled Sentence Contexts for Each Target
Word*

| Set | Meaningful Context | Scrambled |
|-----|-------------------|-----------|
| **TOLD** | | |
| A | I told her the story. | story her told the I |
| B | He told me his name. | his told name me he |
| C | Someone told them a secret. | them someone secret told a |
| D | Mom told us to sleep. | us told sleep mom to |
| **KEPT** | | |
| A | You kept all the money. | money all the kept you |
| B | I kept my coat on. | my kept I on coat |
| C | He kept bothering the cat. | bothering cat kept the he |
| D | We kept the window open. | the open kept we window |
| **HELD** | | |
| A | The mother held her baby. | baby her the held mother |
| B | I held my breath quietly. | my held quietly I breath |
| C | The two girls held hands. | two the held hands girls |
| D | My teacher held the door. | my held door teacher the |
| **TOOK** | | |
| A | I took the last cookie. | last I cookie took the |
| B | We took pictures in school. | school in took we pictures |
| C | My friend took swimming lessons. | swimming took friend lessons my |
| D | The dog took a nap. | dog the took nap a |
| **CAME** | | |
| A | They came to see me. | see came they me to |
| B | She came to my party. | my to party came she |
| C | It came in the mail. | the came mail it in |
| D | We came to the park. | park we to came the |

## GOT

| | | |
|---|---|---|
| A | She got there after lunch. | after got she lunch there |
| B | We got home last night. | night home got yesterday we |
| C | He got his car washed. | he his washed got car |
| D | My teacher got new stickers. | stickers got new teacher my |

## FROM

| | | |
|---|---|---|
| A | The note is from you. | you from is note the |
| B | This present is from him. | him present this from is |
| C | I walked home from school. | home from walked I school |
| D | We drank from the fountain. | the drank fountain from we |

## WITH

| | | |
|---|---|---|
| A | He will go with her. | go he with her will |
| B | I went with my friend. | friend my went with I |
| C | She is with her dad. | her with is dad she |
| D | We talked with the doctors. | the we with talked doctors |

## BUT

| | | |
|---|---|---|
| A | I am little but strong. | strong I but little am |
| B | He eats but feels sick. | sick eats he but feels |
| C | It is sunny but cold. | cold it sunny but is |
| D | Painting is fun but messy. | is but fun messy painting |

## DOWN

| | | |
|---|---|---|
| A | We went down the slide. | slide down the went we |
| B | She runs down the hill. | runs she hill down the |
| C | He puts down the pen. | pen down the puts he |
| D | I laid down in bed. | in I down bed laid |

## INTO

| | | |
|---|---|---|
| A | He walks into the room. | walks he into room the |
| B | He jumped into the water. | jumped water the into he |
| C | I went into the car. | went the I into car |
| D | We crawl into the tunnel. | the we into crawl tunnel |

## MUST

| | | |
|---|---|---|
| A | You must clean your room. | clean your you must room |
| B | They must be very tired. | tired must very be they |
| C | We must read this book. | book we this must read |
| D | Mom must go to work. | go work must to mom |

**Procedures.** There were three types of sessions in this study. Participants met with the researcher individually five times, on five separate days. Participants were screened and pretested during the first session. The screening sessions generally took 15 to 20 minutes to complete with each child. The session started with the child assent form. Then the letter ID task was given, which took the least amount of time, usually less than a minute. Next, the word ID task was completed in one to two minutes. The spelling pretest took the longest, usually about ten minutes. The verb transformations task took about three minutes. All responses except for the child's spellings were hand recorded by the researcher (see Appendix D for record sheets). From this session, participants were screened to select those who could identify at least 18 out of 24 lower case letters but were unable to read more than one of the target words. Participants were rank-ordered by their word ID screener raw scores and then blocked into groups of three. Within each group, they were then randomly assigned to the treatment conditions.

In the second session, participants were trained with one of the word sets (function words or past tense verbs), where they completed one study trial and three test trials with feedback with each of the target words (see Appendix H for scripts and I for record sheets). Participants' knowledge and use of the words taught during the second session were posttested during the third session. Participants were taught the second word type following the same procedures in the fourth session. Participants' knowledge and use of those words were posttested in the fifth session. In other words, each training session was followed by a posttest session with several assessments one day later.

During the second and fourth sessions, participants were trained according to their assigned instructional condition to learn the target words. Training sessions took around

15-20 minutes to complete for each child, regardless of instructional condition. One training session was dedicated to learning the set of past tense verbs and one training session was dedicated to learning the set of function words. In the third and fifth sessions, posttest assessments for the word type taught the previous day were given. Each posttest sessions took 15 to 20 minutes to complete. Posttest sessions for past tense verbs took slightly longer (closer to 20 minutes) than for function words because there was one more assessment for the past tense verbs. The order in which word types were learned (i.e., verb first and function word second, or the reverse) was counterbalanced within and across treatment groups. Participants in the combined context condition were randomly assigned to receive either meaningful sentences first and scrambled sentences second, or the reverse order. This was also counterbalanced across students within this condition (see Table 3). During the third and fifth sessions, participants completed posttest tasks to assess lexical knowledge of the target words they had learned the previous day.

**Table 3**

*Number of Students Assigned to Teaching Order of Word Types across Instructional Conditions*

| Order | Instructional Condition | | | *n* |
|---|---|---|---|---|
| | Scrambled | Meaningful | Combination | |
| Function Words taught first | Function 1st Verbs 2nd *n*=7 | Function 1st Verbs 2nd *n*=6 | Function 1st Verbs 2nd 1st trial Scrambled *n*=3 | |
| | | | Function 1st Verbs 2nd 1st trial MC *n*=4 | 20 |
| Past Tense Verbs taught first | Verbs 1st Function 2nd *n*=11 | Verbs 1st Function 2nd *n*=12 | Verbs 1st Function 2nd 1st trial Scrambled *n*=5 | |
| | | | 1st Verbs 2nd Function 1st trial MC *n*=5 | 33 |
| *n* | 18 | 18 | 17 | 53 |

*Note.* MC = Meaningful Context. Combination condition participants were further assigned into first trial groups: Scrambled or MC.

**Training.** During the two training sessions, participants studied target words with the researcher according to their assigned instructional condition. Scripts for each type of instructional method training can be found in Appendix H. Training sessions consisted of four total trials, one introductory trial and three test trials, each covering word study procedures for the six target words. Across these four trials, participants were exposed a total of eight times to each target word, both alone on a card and on the assigned context card. During the introductory study trial, the researcher displayed an individual word card, read the word aloud, and asked the child to repeat the word. Next, the researcher

displayed a card with the word's context, read that aloud with fingerpointing, and asked the child to repeat with fingerpointing. Then the child was asked to find the target word within the context card. This was repeated five more times to cover the six target words within the word type set.

The second, third, and fourth study trials doubled as test trials. In these three trials, the researcher displayed the target word on a card, asked the child if s/he remembered the word first, and then recorded the response. Then feedback on their response was given. The researcher displayed a new card with the word in its context and proceeded with the word study procedure. After the child identified the word in context, the next target word card was shown and procedures repeated. All data from training procedures were hand recorded by the researcher (see Appendix I for training data record sheets). Specific word study procedures for each instructional condition are described below.

*Scrambled Context.* For the introductory study trial in the Scrambled condition, the researcher started by showing the word card, pointing to the word, and reading it aloud (see Appendix H for Scrambled training script). Then, the researcher asked the child to say the word and also point to it. Next, the researcher showed a scrambled sentence card and read the card aloud slowly while fingerpointing to each word. Each scrambled sentence card included five words, spaced like a typed sentence, but had no capitalization or punctuation. Next, the researcher asked the child to read and fingerpoint to all the words on the card. Corrective feedback was provided to help the child point to and read the words correctly. Finally, the child was asked to find, point to, and read just

the target word on the scrambled sentence card. This was repeated five more times to cover all six words.

In the next three test trials, the researcher displayed the target word on a card with no context and asked the child if s/he remembered the word first to assess whether the child could read each word independently. Their response was recorded. If the child read the word correctly, they were told it was right. If the child did not read the word correctly, the researcher told the child what the word was. Then the trial proceeded like the first study trial; the researcher presented a card containing a scrambled sentence for that target word. The researcher read the scrambled sentence aloud while fingerpointing to each word and then asked the child to do the same. Finally, the child was asked to find, point to, and read the target word on the scrambled sentence card. Then the procedures were repeated for the next target word. For the first study trial and each of the three test trials, different scrambled contexts (scrambled sentences) were presented (i.e., Set A for intro trial, set B for test trial 1, set C for test trial 2, and set D for test trial 3). Training procedures for studying past tense verbs were identical to those used for function words. The order in which children learned the two word types was counterbalanced across participants (see Table 3).

*Meaningful Context.* For the introductory study trial in the Meaningful Context condition, the researcher started by showing the word card, pointing to the word, and reading it aloud (see Appendix H for Meaningful Context script). Then, the researcher asked the child to read the word and also point to it. Next, the researcher showed a meaningful sentence card and read it aloud slowly while fingerpointing to each word. Each sentence card in the Meaningful Context condition was comprised of five words

(the same words used on the scrambled sentence cards), typed as a grammatically correct sentence with capitalization and punctuation (i.e., a period). Next, the researcher asked the child to also read and fingerpoint to all the words on the card. Corrective feedback was provided to help the child point to the correct words. Finally, the child was asked to find, point to, and read the target word on the sentence card. This was repeated five more times to cover all six words.

During the next three test trials, the researcher displayed the target word on a card with no context and asked the child if s/he remembered the word first to assess whether the child could read each word independently. Their response was recorded. If the child did not read the word correctly, the researcher told the child the correct word. Then, just as was done in the first trial, the researcher presented the next meaningful sentence for that word. The researcher read the sentence card aloud while fingerpointing and then asked the child to do the same. Finally, the child was asked to find, point to, and read the target word on the sentence card. The procedures were repeated for the next target word. For the first study trial and each of the three test trials, different meaningful contexts (meaningful sentences) were presented (i.e., Set A for intro trial, set B for test trial 1, set C for test trial 2, and set D for test trial 3). Training procedures for studying past tense verbs were identical to those used for function words. The order in which children learned the two word types was counterbalanced across participants (see Table 3).

*Combination.* In the Combination condition, participants studied the words in both meaningful and scrambled sentence contexts. The order was alternated across the four trials (see Appendix H for Combination script). Similar to the other instructional conditions, the researcher first showed participants the index card displaying only the

target word. The researcher showed the word card, pointed to it, and read it aloud. Then, the researcher asked the child to read and also point to the word. Next, the researcher showed a context card and read it aloud slowly while fingerpointing to each word. These context cards were identical to the ones appearing in Scrambled and Meaningful Context condition; each sentence card (scrambled or meaningful) included five typed words. Then, the researcher asked the child to read and fingerpoint to all the words on the card. Corrective feedback was provided to help the child point to and read the words correctly. Finally, the child was asked to find, point to, and read the target word on the sentence card. This was repeated five more times to cover all six words.

The next trial, test trial 1, would use cards with the alternative context to the first trial (e.g., if the intro trial used meaningful sentences, test trial 1 would use scrambled sentences). The following trial, test trial 2, would again use the alternative context to the previous trial (e.g., if test trial 1 used scrambled sentences, test trial 2 would use meaningful sentences). And finally, the last trial would also use the alternative context to the previous trial (e.g., if test trial 2 used meaningful sentences, test trial 3 would use scrambled sentences). Similar to the other conditions, at the beginning of each test trial, the researcher displayed the target word printed alone on a card and first assessed whether the child could read the word independently. If the child did not read the word correctly, the researcher told the child the correct word. Then, just as was done in the introductory trial, the researcher presented a context card. The researcher read the context card aloud while fingerpointing and then asked the child to do the same. Finally, the child was asked to find, point to, and read the target word on the context card. The procedures were repeated for the next target word. The contexts (sentences) used in the Combination

condition were meaningful sentences and scrambled sentences for sets A and B (e.g.,

scrambled set A for intro trial, meaningful set B for test trial 1, scrambled set B for test

trial 2, and meaningful set A for test trial 3). Training procedures for studying past tense

verbs were identical to those used for function words. The order in which children

learned the two word types was counterbalanced across participants. Also, the context for

the introductory trial, whether words would be presented in meaningful or scrambled

sentences for the first trial (and alternated in later trials), was counterbalanced among

students (see Table 2).

The procedures used during the word study sessions are summarized in Table 4.

The four sets of scrambled and meaningful sentences (A, B, C, D) are displayed in Table

4 for each of the past tense verbs and function words.

**Table 4**

*Training Procedures Used to Study Each Target Word in the Instructional Conditions*

| | Introductory Training Trial | | |
|---|---|---|---|
| Step | Scrambled | Meaningful Context | Combination |
| 1. | Experimenter (E) points to and reads target word from a word card. | E points to and reads target word from a word card. | Based on random assignment, child will either complete Scrambled procedures or MC procedures for intro trial. |
| 2. | E asks child to repeat target word and point to it on card. | E asks child to repeat target word and point to it on card. | |
| 3. | E shows and reads scrambled sentence card while fingerpointing to each word. | E shows and reads meaningful sentence card while fingerpointing to each word. | |
| 4. | E asks child to point to each word and read them aloud. Corrective feedback is given. | E asks child to point to each word and read them aloud. Corrective feedback is given. | |
| 5. | E asks child to point to target word on scrambled card and read it aloud. | E asks child to point to target word on sentence card and read it aloud. | |

| | Test Trials 1, 2, and 3 to Assess Word Learning and Provide Feedback | | |
|---|---|---|---|
| Step | Scrambled | Meaningful Context | Combination |
| 1. | E shows child word card and asks child to read word. Corrective feedback is given. | E shows child word card and asks child to read word. Corrective feedback is given. | The group that completed Scrambled procedures in intro trial will complete MC procedures in Test Trial 1. The group that completed MC procedures in intro trial will complete Scrambled procedures in Test Trial 1. Then the trials will alternate again for Test Trial 2 and again for Test Trial 3. |
| 2. | E shows and reads aloud scrambled sentence card while pointing to each word. | E shows and reads aloud meaningful sentence card while pointing to each word. | |
| 3. | E asks child to read card aloud while fingerpointing each word. | E asks child to read card aloud while fingerpointing each word. | |
| 4. | E asks child to point to target word and read it aloud. | E asks child to point to target word and read it aloud. | |

**Posttests**

Posttests were administered on two separate days during sessions 3 and 5. Posttest sessions lasted approximately 20 minutes (see Appendix J for scripts). Posttests that assessed past tense verb knowledge were administered one day after the past tense verb training session was completed. Posttests that assessed function word knowledge were administered one day after the function training session was completed. Posttests for each word type were administered in the following order to participants individually.

**Flash word ID.** The same selection of words that were presented during the Word ID pretest were included on the posttest. However, two versions of the posttest were created, one that included only the six past tense target verbs, and another that included only the six function words. The 15 nonwords and high frequency words that had appeared on the pretest were divided between the two lists, with eight on the verb list and seven on the function word list in mixed order. The words appeared in all lower-case letters. They were displayed on a laptop screen in a controlled and timed presentation. Words were displayed for 0.5 second each. Children were asked to name the word as it appeared on the screen (see Appendix J for posttest scripts). A practice session of four words for each list (A, DOG, ME, IT and I, CAT, BE, ON) preceded the test words to ensure that children understood the procedure and could see how briefly the words would be displayed. The screen following each flashed word displayed an array of pound symbols with a plus sign in the middle (####+####) to erase the after-image of the previous letters. After children gave their response, or signaled that they had no response, the researcher recorded the response and pressed the space bar to advance to the next word.

This task assessed whether children learned to read the target words as sight words. Correctly read target words received 1 point, for a total score of 6 points for each word type assessed. Success in reading the other words in the assessment (mix of high frequency and nonwords) was recorded but not counted in the posttest score (see Appendix K for record sheet). Parallel form reliability of the two versions of this flash word ID posttest that included one type of target word plus the high frequency words and nonwords was .86, indicating both versions were measuring the same skill. Cronbach's alpha on this task was .61 for past tense verbs and .59 function words. Parallel form reliability treating performance on only the target verbs and function words as two forms of the same construct was .65.

**Sentence production.** In this task, the researcher asked the child to make up a sentence that included each target word (for script, see Appendix J). Words were given orally to children with no spellings shown. The child orally dictated sentences while the researcher hand recorded them. After all data were collected, anonymized responses were transcribed to share with another rater for a second set of scores. The responses were rated on a scale from 0-2. If the child did not respond or did not use the word in the correct way (e.g., "mustard" instead of MUST), the response was score as zero. If the child used the word correctly in a phrase but not a complete sentence (e.g., "down the stairs") or used the present tense form of the target past tense verb (e.g., "I hold your baby" for HELD), the response received one point. Similarly, if the child added -ed to the past tense verb (e.g., HELDED), that also received one point. And finally, if the response contained the target word correctly in a complete sentence, the response received a score of two.

This task was meant to assess the child's knowledge of the words' syntactic and semantic identities as indicated by the ability to use the target words in semantically and syntactically correct sentences. The total possible score for this measure was 12 for each word type. The order of the words was randomized using the List Randomizer on Random.org. Responses were rated by the principal investigator and a trained second scorer. The principal investigator transcribed the sentence production responses for review and scoring by a second trained scorer (see Appendix K for response sheet). Interrater reliability was calculated to ensure that response scores were not affected by researcher bias. The interrater reliability as measured by intraclass correlation coefficient (ICC), was .994 based on a 95% confidence interval, suggesting the scores by the researcher were highly reliable with the given rubric. This ICC estimate and its 95% confidence interval were calculated using SPSS statistical package version 26 by selecting the two-way mixed-effects model (only selected raters) and consistency definition (concerned with the degree to which one rater's score can be equated to another rates score) with multiple raters (two raters) (Koo & Li, 2016). Internal consistency alpha reliability for items on this assessment was .72 for past tense verbs and .75 for function words. Parallel form reliability treating performance on verb and function word sets as two forms of the same construct was .59.

**Spelling target words.** In this task, children were asked to spell each target word by writing it on a response sheet. The experimenter read the word, waited for 3 seconds, and then repeated the target word again (see Appendix J for script). If children asked for a reminder, the word was repeated again. This assessment determined what orthographic knowledge the children had learned from the instructional method. Inverted/reversed or

misplaced correct letters were counted as correct. For example, if a child said out loud

that the letters they wrote were B-U-T, but the writing looks as though they wrote d-u-t,

the word was marked as fully correct. The researcher recorded the child's intended letters

when the child indicated they were different than what appeared (see Appendix K for

response sheets). Responses did not receive corrective feedback. The order of the words

presented in this task was the same order used in the sentence production task.

Assessment scores were based on the total number of letters correct, with a maximum

score of 23 for each word type assessment. A score of total words spelled correctly was

also recorded. Internal consistency alpha reliability for spelling scores using letters

correct was .82 for past tense verbs and .80 for function words. Internal reliability for

spelling scores using whole words correct was .44 for past tense verbs and .65 for

function words. Parallel form reliability treating performance on verb and function word

sets as two forms of the same construct was .87 for letters correct and .72 for words

correct.

        **Syntactic awareness.** This posttest was modeled and adapted from one used to

assess syntactic awareness of first graders in a study by Tunmer, Herriman, and Nesdale

(1988). The researcher read aloud each of 12 sentences with words correctly ordered and

12 sentences with the words scrambled out of order for each word type. The word

sequences were not shown in print to children as they heard the experimenter read them.

The order of the sentences was randomized using the List Randomizer on Random.org.

This task included four new and different sentences for each target word, two with the

words in correct syntactic and semantic order and two with words in a scrambled order

(see Appendix L for sequences). After each sentence was read individually, the child was

asked, "Does that make sense?" Two practice statements were given with feedback

before the assessment items (see Appendix J for script). The researcher hand recorded the

response given by the child (i.e., Yes/No). A score of 1 was recorded for each correct

response. If the response was incorrect or something other than Yes or No, a score of 0

was recorded. A total score out of 24 possible was calculated for each word type (see

Appendix K for response record sheet). Scores below 15 were considered chance level

performance, very likely occurring because the child did not understand the task.

Reliability analysis indicated a high internal consistency alpha reliability of .82 for past

tense verbs and .83 for function words. Parallel form reliability for this task using the two

word types as parallel tests was .79.

**Verb transformations.** This posttest task used the same items and procedures as

the pretest task to assess children's knowledge of the correct past tense form of each

target verb rather than an overregularized form (see Appendix J for script). Scores from

this task were calculated based on number of correct recognition responses out of six (see

Appendix K for response record sheet). Internal consistency alpha reliability for this task

was .61. This test was administered twice as a pretest and posttest. The parallel form

reliability was .79.

Chapter V

**Results**

**Characteristics of Participants**

The three instructional groups differed only slightly in the distributions of students by school type, grade, and gender as shown in Table 1. Performance on pretests indicated that the three groups were comparable at the beginning of the study. Analyses of variance (ANOVA) were conducted with instructional condition as the independent variable and pretest scores as the dependent variable. Mean performance and test statistics are displayed in Table 5. None of the main effects of treatment condition were significant statistically, verifying that the three treatment groups did not differ prior to beginning instruction.

An attempt was made to counterbalance groups by the order in which they were trained for each word type (i.e., verbs or function words learned first). However, the numbers of children across conditions were not equal. There were 20 participants who studied function words first and 33 participants who studied past tense verbs first. To verify that this subgroup assignment did not affect learning and also to verify that word type order did not make a difference in learning, a preliminary ANOVA was conducted. The independent variables were instructional condition, word learning order, and test trials (three total) during the training sessions. The dependent variable was the difference between the number of function words and number of past tense verbs read correctly on each trial. Although there was a main effect for trial (see results in training section below) $F(2, 90) = 7.43$, $p=.001$, there was no main effect detected for word learning order $F(1,45) = .005$, $p=.942$, and no interaction between word learning order, trial, and

instructional condition $F(4,90) = .70$, $p=.594$. These results show that the order in which

children learned the word sets made no difference. Also the imbalance in the number of

students assigned to conditions made no difference. Hence, this variable was dropped

from further analyses.

To qualify for the study, children had to know at least 18 out of the 25 letters

presented. All groups knew on average about 23 letters. The Word ID task included 27

words: 12 target words, 10 high frequency words, and 5 nonwords. Children who read

more than one target word were excluded from the study. The mean number of words

identified on the word ID screener was 3.98 ($SD = 2.24$). Almost all of the children

(94%) were able to read at least one high frequency word by sight.

Most children read zero nonwords, with only one child able to read one nonword

and one child two nonwords. Children had knowledge of most letters, limited sight word

reading, and a lack of decoding skill, which placed them in the partial alphabetic phase in

word reading development. Among children who were able to read one target word, two

were in the Scrambled condition, three were in the Meaningful Context condition, and

three were in the Combination condition, indicating almost equal distribution across

conditions.

**Table 5**

*Mean (SD) Performance of Instructional Conditions on Screening Pretests*

| Measure (max score) | Instructional Condition | | | Total (*N*=53) | *F* | *p* | Partial $\eta^2$ |
|---|---|---|---|---|---|---|---|
| | Scrambled (*n*=18) | MC (*n*=18) | Comb. (*n*=17) | | | | |
| Screener Letter ID (25) | 23.28 (1.40) | 23.22 (1.48) | 23.06 (2.11) | 23.19 (1.65) | 0.08 | .924 | .003 |
| Screener Word ID (27) | 4.22 (2.29) | 3.61 (2.23) | 4.06 (2.33) | 3.96 (2.25) | 0.35 | .710 | .005 |
| Spelling Diagnostic | | | | | | | |
| Letters (31) | 14.83 (4.72) | 14.83 (6.10) | 15.29 (5.25) | 14.98 (5.29) | 0.04 | .959 | .002 |
| Words (8) | 0.67 (1.03) | 0.89 (1.49) | 0.82 (1.19) | .79 (1.23) | 0.15 | .861 | .006 |
| Verb Trans Pretest (6) | 3.56 (1.50) | 3.94 (1.11) | 4.00 (1.17) | 3.83 (1.27) | 0.64 | .532 | .025 |

*Note.* MC is the meaningful context condition, Comb. is combined context condition, ID is identification, Trans is transformation.

The spelling diagnostic measure was composed of five Letter Name stage words having 18 letters, and three Within Word Pattern stage words, having 13 letters. The spelling diagnostic was scored using number of letters correct and number of whole words correct. As evident in Table 5, children spelled about half of the letters on average but few of the words correctly, indicating that this sample of children had spelling skills that were typical of partial alphabetic phase readers. Some common misspellings on the screener included spelling only the first and final letters in WIN, using H or J for the "-ch" sound in MUCH, and using a C for the "-k" in SMOKE. These are common misspellings for partial alphabetic phase readers and reveal that they were using letter names or only partial letters to represent the sounds they detected in words.

On the verb transformations pretest, the mean number of correctly chosen past tense verbs was 3.83 (*SD* = 1.27, 6 maximum). With 38% of the children performing no

higher than chance level (50% correct), this suggests that several were struggling over

whether the generalized -ed should be added to all verbs in the past tense.

**Performance during Training**

During the training sessions, children studied past tense irregular verbs during one

session and function words during another session. For each word type, the first trial

introduced the words in their contexts, either scrambled sentences or meaningful

sentences (see contexts in Table 4). Three test trials with feedback followed. Children

read each word out of context and then received feedback by seeing and reading the word

in its context. A repeated measures ANOVA was conducted with instructional group

(Scrambled Context vs. Meaningful Context vs. Combination of contexts), test trial (Test

Trial 1 vs. 2 vs. 3), and word type (verb vs. function word) as independent variables and

the number of words read correctly on each test trial as the dependent variable. Mean

performance and test statistics are reported in Table 6. Results revealed no significant

main effect of instructional group and no significant interactions involving this variable.

Significant main effects of test trial and word type were detected as well as a significant

interaction between the two variables. The interaction is depicted in Figure 1. No other

effects were significant. These findings fail to support hypotheses involving predictions

about the differential effects of instructional conditions on learning to read past tense

irregular verbs and function words.

**Table 6**

*Mean Performance Reading Past Tense Verbs and Function Words During Training as a Function of Instructional Condition and Test Trial*

| Word Type (max) | | Instructional Condition | | | | | | | Partial $\eta^2$ |
|---|---|---|---|---|---|---|---|---|---|
| | $M$ (SD) | Scrambled (n=17) | MC (n=17) | Comb. (n=17) | Total (N=51) | | F(df) | p | |
| Past Tense Verbs (6) | | | | | | I | 1.39 (2,48) | .259 | .055 |
| Test Trial 1 | | 0.65 (0.79) | 1.29 (1.53) | 0.94 (1.14) | 0.96 (1.20) | W | 44.42 (1,48) | .001** | .481 |
| Test Trial 2 | | 1.18 (1.07) | 1.59 (1.70) | 1.88 (1.50) | 1.55 (1.45) | T | 44.29 (2,96) | .001** | .480 |
| Test Trial 3 | | 1.41 (1.33) | 2.06 (1.85) | 2.24 (1.82) | 1.90 (1.69) | IxW | 0.16 (2,48) | .854 | .007 |
| Function Words (6) | | | | | | IxT | 0.45 (4,96) | .770 | .019 |
| Test Trial 1 | | 1.12 (1.41) | 2.18 (2.13) | 2.24 (1.64) | 1.84 (1.79) | WxT | 6.99 (2,96) | .001** | .127 |
| Test Trial 2 | | 1.88 (1.50) | 2.42 (1.94) | 2.59 (1.73) | 2.29 (1.72) | IxWxT | 1.11 (4,96) | .359 | .044 |
| Test Trial 3 | | 3.00 (1.94) | 3.65 (2.00) | 3.59 (2.00) | 3.41 (1.96) | | | | |

*Note. I* = instructional condition main effect, *T* = test trial main effect, and *W* = word type. MC is the meaningful context condition, Comb. is combined context condition.

**Figure 1**

*Mean Number of Test Trial Successes by Word Type*
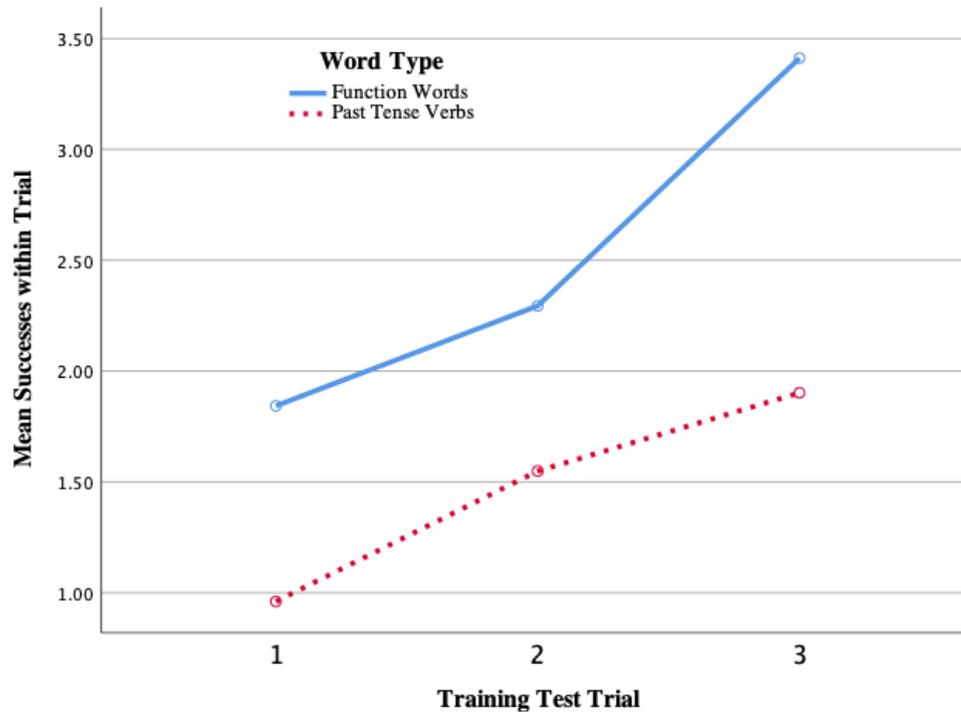


From Figure 1, it is apparent that children learned to read function words more easily than past tense verbs. In addition, the growth from Trial 2 to Trial 3 was significantly greater for function words than for verbs. Children were struggling to learn the verbs. By the final trial, only 32% of the verbs were read correctly. In contrast, 57% of the function words were read. Based on this difference in learning the two word types, one would expect performance with function words to surpass performance with verbs on the posttests.

These findings support the hypothesis that function words are learned differently from irregular past tense verbs. The most frequent incorrect response at the beginning of each test trial was a nonresponse. The next most frequent incorrect response, after children were encouraged to "give it a try," was an attempt to say the sound of the initial

letter of the word. And finally, the third most frequent incorrect response was a full-word guess, usually a word that also began with the same letter. A few times, children misread TOLD for TOOK, most likely because TOLD followed TOOK in the training and these words share their first two letters. This is an example of partial cue use to remember how to read words by children in the partial alphabetic phase of development.

**Posttests**

   **Statistical Analyses.** Several posttests were administered to assess effects of instruction and word type on measures of sight word reading, orthographic memory, semantic knowledge, and syntactic knowledge of the target words. ANOVAs were conducted with instructional condition (Scrambled context vs. Meaningful Context vs. Combination) and word type (past tense verb vs. function word) as the independent variables. Word type was a repeated measure. The dependent variables were drawn from four posttests: flash word ID, sentence production, spelling (both letters and words), and syntactic awareness. Results of the ANOVAs reported in Table 7 show that none of the posttest means differed significantly as a function of instructional condition, with all $p$s > .20. None of the interactions between instructional condition and word type was significant. However, the effect of word type was significant across four of the posttest measures. Comparison of means in Table 7 reveals that function words were read by sight more accurately than verbs. Also function words were spelled more accurately than verbs, on both the letter and word correct measures. However, verbs were embedded in higher quality sentences than function words.

   Additionally, the verb transformations posttest was examined for differences between instructional groups using a one-way ANOVA, with instructional group as the

independent variable and scores on the verb transformation posttest as the dependent

variable. Results of the one-way ANOVA showed no significant difference among the

instructional groups in the number of correct irregular verb forms recognized, with $p >$

.20 (see Table 7).

These findings fail to support Hypotheses 1 through 4 involving predictions about

the differential effects of instructional conditions on learning the orthographic, syntactic,

and semantic identities of past tense irregular verbs and function words. However,

findings support the hypothesis that function words are learned differently from irregular

past tense verbs.

**Table 7**

*Mean Performance on Past Tense Verb and Function Word Posttest Measures across Instructional Conditions*

| Measure (max) M (SD) | Instructional Condition | | | | | F | p | Partial $\eta^2$ |
|---|---|---|---|---|---|---|---|---|
| | Scrambled (n=17) | MC (n=17) | Comb. (n=17) | Total (N=51) | | | | |
| FlashWd ID (6) | | | | | I | 0.65 | .525 | .026 |
| Verb | 0.41 (0.71) | 0.76 (1.09) | 0.76 (1.20) | 0.65 (1.02) | W | 20.44 | .000** | .299 |
| % Zero | 71 | 59 | 59 | 63 | IxW | 2.06 | .139 | .079 |
| Function | 1.47 (1.23) | 1.06 (1.14) | 1.82 (1.88) | 1.45 (1.46) | | | | |
| % Zero | 24 | 41 | 35 | 33 | | | | |
| Sentence Production (12) | | | | | I | 0.81 | .453 | .943 |
| Verb | 10.18 (2.04) | 11.12 (0.93) | 10.24 (3.07) | 10.51 (2.19) | W | 24.14 | .000** | .335 |
| Function | 7.53 (3.57) | 8.59 (3.20) | 9.00 (3.41) | 8.37 (3.39) | IxW | 1.08 | .347 | .043 |
| Spelling | | | | | | | | |
| …Letters (23) | | | | | I | 1.32 | .276 | .052 |
| Verb | 10.41 (3.61) | 12.71 (4.52) | 12.59 (5.17) | 11.90 (4.52) | W | 12.15 | .001** | .202 |
| Function | 12.29 (4.51) | 13.35 (4.20) | 14.41 (3.66) | 13.35 (4.15) | IxW | 0.93 | .400 | .037 |
| …Words (6) | | | | | I | 2.25 | .117 | .086 |
| Verb | 0.24 (0.44) | 0.88 (1.05) | 0.76 (0.75) | 0.63 (0.82) | W | 11.97 | .001** | .200 |
| % Zero | 76 | 47 | 41 | 55 | IxW | 1.16 | .210 | .063 |
| Function | 0.76 (1.25) | 1.06 (1.20) | 1.59 (1.50) | 1.14 (1.34) | | | | |
| % Zero | 65 | 53 | 29 | 49 | | | | |
| Syntactic Awareness (24) | | | | | I | 1.56 | .221 | .061 |
| Verb | 18.06 (4.31) | 20.29 (3.58) | 20.82 (3.91) | 19.73 (4.05) | W | 0.04 | .838 | .001 |
| Function | 19.24 (3.73) | 19.41 (4.68) | 20.82 (3.56) | 19.82 (4.00) | IxW | 1.57 | .220 | .061 |
| Verb Trans (6) | 3.94 (1.68) | 4.53 (1.33) | 4.59 (1.42) | 4.35 (1.48) | I | 0.99 | .378 | .040 |

*Note.* I = instructional condition main effect, W = word type main effect, IxW = the interaction between instruction and word type. MC is the meaningful context condition, Comb. is combined context condition, ID is identification, Trans is transformation.

**Sight word reading posttest.** The flash word ID posttest measured sight word reading with timed presentations of target words mixed in with other non-target words. Words were flashed on a screen for a half second and children were asked to read aloud what they saw. Results of the ANOVA showed that instructional condition exerted no significant effect on sight word reading but the effect of word type was significant, with verbs read more accurately than function words (see Table 7). Because the distributions of scores were skewed rather than normal, non-parametric Kruskal Wallis tests were conducted to determine whether the distributions were the same across instructional conditions. Results were not significant, with $p = 0.63$ for verbs and $p = 0.51$ for function words, confirming the absence of differences as a function of instruction. Performance reading words by sight was poor with the percentages of children scoring zero ranging from 59% to 71% for verbs across conditions, and from 24% to 41% for function words across conditions. Whereas children read on average 5.31 target words correctly during the final test trials, a day later they read only on average 2.10 words when flashed on the screen during the posttest. These findings suggest that the sight word reading task may have lacked sufficient sensitivity. Perhaps children in the partial alphabetic phase require more exposure time to attend to words they have been taught in order to read them in a flash from memory.

**Sentence production posttest.** The sentence production task required children to create and orally recite a sentence using a target word spoken by the researcher. Children were not shown the written words. This task assessed whether students recognized the syntactic and semantic identities of the target words they were taught. Sentence quality was assessed on a scale from zero to two, for a total possible score of 12 for each word

type. Results of the ANOVA showed that instructional condition did not have a significant effect on sentence production (see Table 7). However, word type did affect performance. Sentence production scores were significantly higher on average for past tense verbs compared to function words. Scores were high overall on this measure. Children embedded on average 88% of the verbs in acceptable sentences and 70% of the function words in acceptable sentences. These findings indicate that children did recognize the syntactic and semantic identities of the target words, even children in the scrambled condition who did not read the words in meaningful contexts.

The sentence production scoring rubric allotted one point for sentences that used the present tense form of the given past tense verb, as well sentences that used the past tense verb with overregularized endings. Interestingly, HELD was the only verb for which these special cases applied. There were two instances where a present tense form was used in place of the past tense verb, i.e., HOLD in place of HELD. This verb also had three instances of overregularized endings: one child used HELDING and two children used HELDED. Interestingly the past tense form was overregularized rather than the present tense form. A reanalysis that revised scores by allotting these HELD responses zero points did not alter results and still revealed that children created higher quality sentences with verbs than with function words.

Children's responses in this task were examined further to expose possible difficulties. Although they were told to embed the words in sentences, a few children began spelling the words out loud. The researcher corrected them, but some still did not understand the instructions, suggesting that they lacked metalinguistic awareness of how to construct sentences.

Another type of response suggested a lack of lexical awareness of the syntactic/semantic identities of function words that were taught. One child, apparently without awareness, included one of the target words in a sentence intended for a different target word. This child was not able to produce a sentence containing WITH when directed to do so and left the word out of the sentence. However, the child had included WITH successfully in a prior sentence meant to test another target word.

Some incorrect responses substituted a more meaningful homonym of a target word in sentences. Three participants used the word BUTT rather than BUT. Five participants used the word MUSTARD when they were asked to use the word MUST, with three of those creating grammatically correct full sentences. All five of these sentences received scores of zero. One participant used the word FORGOT when they were asked for the word GOT, which also received a score of zero. For these children, training was not sufficiently effective to learn associations between these context-dependent words spoken in isolation and their function in language.

Responses were produced that embedded target words in grammatically acceptable sentences but assigned syntactic or semantic identities that were different from those taught in the study. For example, none of the training sentences used the word INTO in a way that means "interested in." However, three children in the Scrambled context condition used the word INTO in this way, e.g., "I'm into ice cream." Two children did this with verbs, GOT and HELD. The word GOT was used in a way that meant being able to handle something. The child said, "I got this, that means I can do it by myself." The word HELD was used in the phrase "held out" to mean wait on something, "My friend held out for me." In the case of INTO and GOT, both instances

converted the words into present tense verbs. The two children misusing GOT and HELD studied words in the Combination condition where they saw and read target words in two meaningful sentences and two scrambled sentences with no meaning.

**Spelling posttest.** The spelling posttest required children to spell the target words independently by writing them on a response sheet. Spellings were scored using two measures, number of letters correct, and number of words spelled correctly. Results of the ANOVA showed that instructional condition did not impact orthographic memory. However, word type did exert a significant effect. Children spelled more function words than verbs correctly on both letter and word measures. From Table 7, it is evident that children remembered on average over half of the letters in words, 58% in function words, and 52% in verbs. However, memory for complete spellings of words was poor, with means of only 19% of function words and 11% of verbs spelled correctly. Poor memory for complete spellings of words is a characteristic of children in the partial alphabetic phase of development.

The number of children spelling no words correctly varied across instructional conditions, ranging from 41% to 76% for verbs, and 29% to 65% for function words (see Table 7). Because the distributions of scores were skewed rather than normal, non-parametric Kruskal Wallis tests were conducted to examine whether the distributions across instructional conditions were the same. Results fell just short of significance for verbs, $p = .056$; the result for function words was not significant, $p = .205$. Comparison of verb and function percentages across conditions in Table 7 suggests a trend. Several more children in the scrambled condition spelled no verbs correctly than children in the other conditions, and fewer children in the combination condition scored zero in spelling

function words than in the other conditions. However, these differences though suggestive were not statistically significant.

**Syntactic awareness posttest.** The syntactic awareness task consisted of 48 word sequences spoken orally by the experimenter. No printed sequences were shown to the children during this posttest. Half of the sequences included a function word and half a past tense verb. Half of the sequences contained words that were ordered grammatically to form syntactically and semantically acceptable sentences. Words in the other half of the sequences were scrambled and ungrammatical. Children listened to each word sequence and then answered the question, "Does that make sense?" with a yes or no response. Results of the ANOVA showed that neither instructional condition nor word type exerted any effect on performance (see Table 7). The total possible score on this task was 48 correct, with chance level performance on the yes/no questions at 24 correct. Children performed well above a chance level, with an overall mean performance of 40.0 or 82% correct. This indicates that they understood the task and possessed syntactic awareness. One possible explanation why the verbs and function words did not influence performance may be that, being context-dependent words whose meanings are intertwined with their contexts, their presence in the word sequences may not have even been noticed.

**Verb transformation posttest.** The verb transformations posttest required children to listen to each of several sentences that contained the present tense form of a target verb and then choose between two options for use of that same verb in the past tense. No sentences were shown during this task. One option offered an over-regularized form of the irregular verb by adding an -ed ending to the present tense. The other option

offered the correct irregular past tense form. The total possible score on this task was 6,

with chance level performance at 3. It was predicted that children who studied the verbs

in meaningful contexts would recognize more of the correct forms. However, results of

the ANOVA showed that instructional condition did not affect scores on this posttest.

Mean scores across conditions ranged from 66% to 77% correct, indicating that

performance was above a chance level.

This task was administered as a pretest and repeated as a posttest. To determine

whether students' scores improved, an ANOVA was conducted with instructional

condition and test point as the independent variables. Results revealed no significant

main effect of instruction, $F(2,48) = 1.07$, $p = .35$, and no significant interaction, $F(2,48)$

$= 0.10$, $p = .91$. However, a significant main effect of test point was detected, $F(1,48) =$

9.29, $p = .004$. Children's scores improved from a mean of 3.84 (SD = 1.29) on the

pretest to a mean of 4.35 (SD = 1.48) on the posttest. (See pretest and posttest means in

Tables 5 and 7.) This suggests that instruction in all three conditions improved children's

awareness of the correct past tense forms of these irregular verbs. An alternative

interpretation is that repetition of the task improved scores.

**Performance on individual words**. Children were taught six irregular past tense

verbs and six function words. Performance on assessments distinguished a few words

from the others. The function word BUT had more successful readings during training

and on the sight word reading posttest than almost all other target words (GOT was

slightly more successful on the sight word posttest). However, children's scores on the

sentence production task showed that BUT was the most difficult word to embed

compared to all target words. As mentioned above, some students produced sentences

with its homonym BUTT. This reveals the reason for superior performance with BUT on the other tasks. It was interpreted as a noun, a form class known to be easier to learn than function words. Other potential difficulties with this word are explored later in the discussion.

The past tense verb GOT was the second most successfully read target word during training and the most successful on the sight word posttest. Also, it was recognized as the correct past tense verb form by all but two children on the verb transformations posttest. In contrast, children failed to recognize the verb HELD above a chance level (49% correct) on this task. Similarly, on the verb sentence production posttest, children received the lowest scores for HELD ($M = 1.59$, $SD = 0.67$). Performance with the other verbs was more similar across the tasks. The same was true for the function words across tasks.

**Correlational Analysis**

A supplementary analysis was performed in order to examine correlational relationships among pretest, training, and posttest measures. Pearson Produce Moment correlations were calculated between two pretest measures (sight word reading and letters spelled correctly), one training measure (sum of words read correctly across three test trials), and five posttest measures. To calculate training and posttest measures, scores on the verb and function word test items were combined. Correlations are displayed in Table 8. It is apparent that there was substantial shared variance among the pretest and training measures, with $r$s ranging from $r = .45$ to $r = .62$, $p$s < .001, suggesting that children's entry level word reading and spelling skills contributed to their ability to learn to read the words during training. Also it is evident that scores on the posttests assessing different

aspects of children's word knowledge were moderately and significantly correlated, with values ranging from $r = .34$ to $r = .56$, $p$s $< .015$. This suggests that somewhat different aspects of word knowledge were assessed across these tasks though there was some shared knowledge. The spelling and word reading pretests were significantly correlated with all of the posttest measures, with values ranging from $r = .34$ to $r = .75$, $p$s $< .015$. Values were especially strong on tasks assessing the same underlying word reading or spelling skill. The correlations between the word training measure and all of the posttests were especially strong, ranging from $r = .56$ to $r = .70$. This suggests that verb and function word training contributed to children's performance with the target words on the posttests.

**Table 8**

*Correlations between Screener Measures and Posttest Measures for All Target Words*

| Measure | M | SD | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| 1. Screener Word ID | 3.96 | 2.25 | | | | | | |
| 2. Screener Spell Lett | 14.98 | 5.29 | .45** | | | | | |
| 3. Total Test Trial | 11.96 | 8.34 | .53** | .62** | | | | |
| 4. Total Post Flash ID | 2.10 | 2.16 | .58** | .43** | .70** | | | |
| 5. Total Post Sent Prod | 18.88 | 4.79 | .35* | .51** | .62** | .34* | | |
| 6. Total Post Spell Lett | 25.25 | 8.14 | .39** | .75** | .66** | .54** | .38** | |
| 7. Total Post Syntax | 39.55 | 7.28 | .34* | .52** | .56** | .42** | .56** | .47** |

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

One question of interest was whether children's entry level word reading and spelling abilities explained any additional variance on the posttests above and beyond that contributed by effects of word training. To determine this, a hierarchical stepwise multiple regression analysis was conducted on each posttest measure. The three

predictors were pretest sight word reading, pretest letters spelled correctly across words, and a word training measure consisting of the sum of words read correctly across three test trials. The word training measure was entered first followed by each of the other two measures. Results are shown in Table 9. A word of caution is offered in interpreting findings. The fact that correlations were at least moderate and significant indicates shared variance. Even though a predictor may explain no unique variance, it still may share variance with other predictors that do explain unique variance.

**Table 9**

*Model Summary of Hierarchical Regression Analyses Displaying Significant Unique Pretest and Training Predictors of Performance on the Posttest Measures*

| Predictors | Beta[b] | $R^2$ | $R^2$ Change | $F$ Change | df | Sig. $F$ Change |
|---|---|---|---|---|---|---|
| Outcome: Sight Word Reading[a] | | | | | | |
| 1. Training .561 | | .485 | .485 | 46.180 | 1,49 | .001 |
| 2. Word ID .295 | | .547 | .062 | 3.191 | 2,47 | .050 |
| | | | | | | |
| Outcome: Sentence Production[a] | | | | | | |
| 1. Training .622 | | .387 | .387 | 30.898 | 1,49 | .001 |
| | | | | | | |
| Outcome: Spelling Letters[a] | | | | | | |
| 1. Training .324 | | .440 | .440 | 38.516 | 1,49 | .001 |
| 2. Spell Let .557 | | .631 | .190 | 12.112 | 2,47 | .001 |
| | | | | | | |
| Outcome: Syntactic Awareness[a] | | | | | | |
| 1. Training .663 | | .440 | .440 | 38.516 | 1,49 | .001 |
| | | | | | | |
| Outcome: Verb Transformations[a] | | | | | | |
| 1. Pre VTra[b] .530 | | .421 | .421 | 35.669 | 1,49 | .001 |
| 2. Spell Let .319 | | .509 | .088 | 8.552 | 1,48 | .005 |
| | | | | | | |
| Outcome: Training Test Trials Reading Words[c] | | | | | | |
| 1. Spell Let .483 | | .384 | .384 | 30.594 | 1,49 | .001 |
| 2. Word ID .335 | | .478 | .093 | 8.571 | 1,49 | .005 |
| | | | | | | |
| 1. Word ID .335 | | .283 | .283 | 19.349 | 1,49 | .001 |
| 2. Spell Let .483 | | .478 | .195 | 17.877 | 1,49 | .001 |

*Note*. Training and outcome measures were sums of verb and function word scores on all but the verb transformation measure which was limited to verb scores. Standardized Beta is reported. Step numbers indicate order of forced entry into the regression analysis.
[a]Predictors evaluated were Training words read on test trials, Word identification by sight on pretest, and Spelling letters in words on pretest. Values for predictors whose contributions to the models were not significant are excluded.
[b]Predictor was the pretest assessing verb transformations.
[c]Predictors evaluated were pretests assessing Word identification by sight and Spelling letters in words.

Results in Table 9 reveal that the training children received in reading verbs and

function words explained significant variance on all of the posttests except one assessing

verb transformations. Pretests explained additional unique variance only on posttest measures assessing the same ability. Children's pretest sight word reading ability explained 6% additional variance in reading target words by sight on the posttest. Children's pretest letter spelling ability explained 19% additional variance on the posttest assessing the spelling of letters in target words. Word training was the only predictor of performance on the sentence production and syntactic awareness posttests. Both of these tasks were conducted orally without the target words being shown, possibly reducing the influence of word reading and spelling abilities.

A verb transformation posttest was administered to assess children's recognition of correct past tense forms of irregular verbs that they had been taught to read during training. This task had also been given as a pretest. A hierarchical regression analysis was conducted to examine whether reading and spelling ability pretests and the training measure predicted performance on this posttest beyond that predicted by the verb transformation pretest. The training measure was limited to verb reading scores summed across test trials. Results in Table 9 show that verb transformation pretest scores explained 42% of the variance on the posttest. Only the spelling pretest explained additional unique variance, 9%. Neither word training nor sight word reading made a significant contribution. The correlation between the verb training measure and the posttest verb transformation measure was small but significantly greater than zero, $r = .25$, $p = .038$. Also, mean scores on the verb transformation measure increased significantly from pretest to posttest, as reported above. These latter findings suggest that training may have exerted a limited effect in strengthening children's awareness of the correct forms of irregular past tense verbs.

Another question of interest was whether children's word reading and spelling abilities contributed to their success in learning to read the words during training. Hierarchical regression analyses revealed that both abilities explained unique variance on this measure. As shown in Table 9, sight word reading explained 9% additional variance beyond that explained by spelling ability, and spelling ability explained 20% additional variance beyond that explained by word reading.

Chapter VI

**Discussion**

**Summary of Results**

The purposes of this study were to examine the effects of instructional methods on beginning readers' word learning when contextual meaning is varied and to examine the effect of word type on word learning, with two types of context-dependent words: function words and past tense verbs. Instructional methods involved embedding the words in a Scrambled Context condition, a Meaningful Context condition, and a Combination condition. Word knowledge was examined in terms of different word identities: phonological, orthographic, syntactic, and semantic.

The first research question investigated was whether the three instructional conditions would impact children's word learning differently on posttest measures. It was hypothesized that instructional condition would significantly affect word learning as shown by scores on measures of word reading, spelling, oral sentence production, and syntactic awareness. Results did not support expectations. It was found that there were no significant differences in performance between the three instructional conditions during training or on posttests.

The second research question investigated whether children in the Scrambled condition would score better on measures of reading and spelling compared to the Meaningful Context condition. It was found that the Scrambled condition did not boost performance on any posttest measures when compared to the other instructional conditions.

The third research question investigated whether children in the Meaningful Context condition would score better on the sentence production and syntactic awareness tasks compared to the Scrambled Condition. Results were negative. Performance did not differ across conditions on any of the posttest measures, including sentence production scores and the syntactic awareness task.

The fourth research question investigated whether children in the Combination condition would score better on measures of reading, spelling, sentence production, and syntactic awareness compared to both the Scrambled condition and the Meaningful Context condition. It was found that the Combination condition did not perform better on any of the posttests compared to the other instructional conditions.

The fifth research question investigated whether children would learn function words better than irregular past tense verbs as revealed on assessments of word reading, spelling, oral sentence production, and syntactic awareness. Results were varied and favored one or the other word type depending on the measure. During training, students learned to read function words better than past tense verbs. On posttests, flash word ID scores and spelling posttest scores were higher for function words than verbs. However, oral sentence production scores were higher for past tense verbs than for function words. Syntactic awareness task scores did not show a significant difference between the two word types.

To summarize findings, results showed that the type of instructional context did not affect students' learning of context dependent words in this study. Performance across treatment conditions was similar during training on the measures of word reading on test trials and on all posttest measures. This may be attributed to the short length of the

study sessions, where children were exposed to each target word only 8 times. However, results showed that word type did influence performance. Across all instructional conditions, children scored higher on measures of word reading and spelling for function words compared to past tense verbs, but children scored higher on the measure of oral sentence production for past tense verbs compared to function words. Word type exerted no effect in the syntactic awareness task.

**Word Training**

During training sessions, children studied target words with the researcher according to their assigned instructional condition. To introduce the target words, the researcher read the words and their contexts (i.e., scrambled sentence or meaningful sentence) during the introductory trial. Then, in three subsequent test trials, children were asked to read the target word on a card before the researcher read it to them. If they were able to read a word independently, that was counted as a successful test trial for that word. There was a significant main effect for test trial. Children were able to read more words on their third test trial than they were on their first and second test trials. This shows that training trials in all three instructional conditions had a positive effect on word recognition.

**Effects of instructional condition.** It was hypothesized that exposure to a Scrambled instructional context would benefit decoding ability more than exposure to the Meaningful Context. Decoding was assessed during training at the beginning of each test trial when the researcher asked children to try to read the words printed on cards. There were no differences between instructional conditions in how accurately students read the

words on the test trials. Instructional conditions also did not influence students' gains in reading the words from one test trial to the next.

The training conditions in Ehri's (1976) study manipulated context during instruction for context-dependent and context-free words to prereaders and readers. For both types of words, exposure to the target words in sentences did not help learning. These findings are consistent with the current study's findings. Interestingly, Ehri did not show printed sentences as was done in the current study. When context was added in the study by Ehri, it was only spoken. Word learning for each word was measured by the number of trials the child took to reach two errorless trials in a row or 30 minutes elapsed. This method of measuring word recognition parallels the test trial procedure used during the training phase of the current study.

These findings differ from those of Ehri and Roberts (1979) and Ehri and Wilce (1980). The meaningful context training in both Ehri and Roberts (1979) and Ehri and Wilce (1980) had children read target words in meaningful sentences. The other condition in Ehri and Roberts (1979) was an isolation condition, where children read target words alone on flash cards. The alternative condition in Ehri and Wilce (1980) was a "no meaning" group, where children read target words in non-meaningful lists on cards (the ten target words were listed with supplemental words in syntactic disarray). In these studies, the meaningful instructional condition did not include any words read in isolation. However, the current study included a form of isolated word reading with corrective feedback in all three conditions before reading the words in differentiated context. This may have given all the children isolated word training and hence minimized effects of reading words in the different contexts and reduced differences observed across

conditions. In this way, one of the critical events facilitating word learning during the test

trial (i.e., reading the isolated words and receiving feedback) was the same across all

three conditions. To determine whether the difference in procedures affected learning, the

current study could be replicated with the meaningful context training procedures more

similar to that of Ehri and Wilce (1980), where participants are not exposed to target

words outside of a meaningful context.

The training procedures in the current study were most similar to Miles (2015)

with regard to isolated word presentation accompanying meaningful contexts. In a

flashcard learning task, Miles (2015) taught a total of twelve content and context-

dependent words in meaningful and isolation conditions to native and nonnative speakers.

Leading up to training for the context-dependent words, children participated in three

sessions of either orthographic mapping or storybook reading. In the flashcard learning

task, students learned words in isolation and in meaningful sentences. Flashcard training

in both groups occurred in four trials, a study trial followed by three test trials, similar to

the current study. Miles also reported similar time spent in flashcard learning sessions of

15 minutes. The cards showing only the target word were presented first and read by

participants. In the meaningful condition, the following card contained the meaningful

sentence, which was fingerpoint read by the researcher. In the isolation condition, the

following card was simply another isolated spelling of the target word. Results showed

significant differences between instructional conditions on measures of word reading,

spelling, and sentence production. For native speakers, spelling performance was

significantly better when words were instructed in isolation. For both native and

nonnative speakers, the quality of the sentences they produced was significantly better when words were instructed in meaningful contexts.

One major modification to Miles' (2015) procedure in the current study was the addition of a scrambled sentence condition, which attempted to control for exposure time to target words. Greater exposure time to the words in Miles' isolation condition could have been a key factor explaining superior performance reading and spelling target words by students in the isolation condition compared to the meaningful context condition. Current findings support this possibility by showing that elimination of exposure time differences between the scrambled and meaningful context conditions yielded no difference in reading and spelling target words.

The other major modification of Miles' (2015) was not including sessions that involved instruction in orthographic mapping or guided word study like storybook reading with grammar and vocabulary discussions. However, Miles did not find that these treatment conditions significantly affected flashcard word learning task, so they were excluded from the current study's design.

**Effects of word type.** It was hypothesized that the word identities of function words would be learned differently than the word identities of past tense verbs. A significant difference in word recognition was detected during the training phase of the study. Function words were easier to learn to read across test trials than verbs. There was also a significant interaction effect for word type and test trial. Figure 1 displays students' progress in learning to read the two types of words across test trials. An examination of the slope of the two lines between the second and third test trials shows the interaction effect. This interaction indicates that children learned function words at a faster rate when

compared to past tense verbs, as indicated by the steeper slope. Other factors possibly explaining this difference can be ruled out. The function word and past tense verb word sets contained the same number of letters, 23. Similarly, both word sets contained the same number of unique letters, 12. Furthermore, the words were embedded in the same number of words (i.e., 5) in each of their contexts, either meaningful sentence or scrambled sentence.

One possible explanation why the past tense irregular verbs took longer, or were more difficult to learn to read, is because they are less recognizable due their lower frequency. Only two of the chosen past tense verbs rank within the top 30,000 words in frequency according to the Corpus of Contemporary American English (Word and Phrase Frequency List, 2012). Meanwhile all the function words are within the top 150 words. Similarly, the Dolch 220 list used to choose the target words contained only two of the past tense verbs, while the other four appeared on the list in the present tense. If these words occur less frequently in speech, then children would possess less background information to connect the verbs to their past tense meanings during the training trials. This would slow the word learning process.

The word type effects that occurred during training extend previous findings on word learning differences according to word class. Ehri (1976) found that content words (e.g., *box*, *fast, milk*) were learned more rapidly than context-dependent words (e.g., *came, at*, *could*). The list of words learned included four past tense verbs, three prepositions, a conjunction, and an auxiliary verb. The context-dependent words used in that study did not differentiate between past tense verbs and function words in terms of ease of word learning as was done in the current study.

**Posttests**

    **Instructional condition.** The following four hypotheses predicted that the contexts accompanying the words during training would influence what students learned about the words. It was hypothesized that the three instructional conditions would impact word learning differently as evidenced on posttest measures. However, results failed to support hypotheses. No significant differences in performance were detected on posttests to distinguish the three instructional conditions.

    It was also hypothesized that children who learned words under the Scrambled condition would show better performance on posttests of word reading and spelling. The Scrambled condition did not affect performance on any posttest measure when compared to the other instructional conditions.

    Another hypothesis was that children who learned words under the Meaningful Context condition would show better performance on posttests of sentence production and syntactic awareness. The Meaningful Context condition did not show better performance on any of the posttest measures, including sentence production scores and the syntactic awareness task.

    And finally, it was hypothesized that children who learned words under the Combination condition would perform better overall on posttests. The combination condition did not perform better on any of the posttests.

    Current findings contrast with Ehri's (1976) study where students who learned context-dependent words without meaningful contexts performed poorly on a sentence production posttest compared to students who learned context-dependent words in meaningful sentences. In fact, the former group was unable to create any sentences for

five of the context-dependent words. In contrast, performance of students in the current

study in the Scrambled (no meaning) Context condition was not depressed. They were

able to generate sentences for many of the words (see Table 7) and did not differ from

groups who learned the words in meaningful contexts. Differences between the two

studies may explain the difference in findings. One reason may involve the difference in

word learning conditions. Whereas students in Ehri's study heard spoken sentence

contexts and learned spoken words, students in the current study saw and read words

embedded in written contexts, either scrambled or meaningful sentences. Perhaps seeing

the words helped students better recognize their linguistic identities even without being

exposed to meaningful contexts. Another factor may be the difference in participants'

literacy development. Whereas Ehri's students were prereaders, students in the current

study knew letters and could read a few words.

The lack of main effects of instruction in this study differ from other previous

studies that varied context in instructional approaches. These differences might be due to

differences in the features and extensiveness of training.

Ehri and Roberts (1979) compared context and isolation instructional methods for

teaching pairs of homonyms. They found that teaching these words embedded in printed

meaningful sentence contexts benefitted sentence production and discrimination of

meanings, while teaching the words printed in isolation benefitted word reading and

spelling knowledge. The training in the former study lasted for three days and presented

each of the 16 words a total of 16 times. Training also included supplementary material

that reinforced word meanings, including using questions and pictures. The study's

training methods contained more elaboration of target words in both isolation and context

instructional conditions than in the current study. In future research, if this elaboration were included in extensions of the current study, the syntactic awareness posttest might show significant differences between instructional conditions. This could create even more powerful semantic and syntactic connections when paired with meaningful printed sentences.

Unlike the current study, the isolation condition in Ehri and Roberts (1979) study elaborated the semantic identities of target words with pictures and questions. This might have helped the isolation condition participants remember word features and spellings by creating more connections for the words in memory. The current study only showed the words in isolation and then had students read the scrambled sentences as a modified isolation condition. No further elaboration on word meanings was provided. The current study's training lasted 2 days, covering each of the 12 words a total of 8 times (once on a card alone and once in a sentence/scrambled sentence, over 4 trials). The differences in elaboration during training and length of training distinguishing the two studies may account for the differences in findings. Either or both of these differences in methodology could account for the different results.

Ehri and Wilce (1980) found significant differences between instructional methods when teaching context-dependent words. The study compared an isolation condition to a context condition and found that the isolation condition benefitted orthographic and phonological identities while the context condition benefitted semantic and syntactic identities of words. Training in this study included teaching 47 supplementary words that would be used later to teach target words. The target word training consisted of drawing attention to letter-sound correspondences and teaching to a

criterion of two perfect trials. Also, target word instruction in the context condition

included a discussion of pictures that illustrated the meaning of the sentences that

contained the target words. Participants in the isolation condition also discussed the

meanings of pictures but did not read the target word in a meaningful sentence.

There are three possible differences in the training methods used by Ehri and

Wilce (1980) that may explain why instructional differences found there were not found

in the current study. First, the current study did not teach any supplemental words from

the context and scrambled sentences. The researcher assisted children in fingerpoint

reading the five-word training cards with meaningful sentences and scrambled sentences,

making the additional word instruction unnecessary to complete training procedures. Ehri

and Wilce (1980) taught children from both groups the supplemental words, so the effects

from this additional instruction should apply to both groups. However, the additional time

spent in explicit word instruction might have affected other types of word knowledge,

such as increased lexical awareness, that interacted with the effects of the instructional

conditions. Secondly, the current study's methods, for all instructional conditions, did not

elaborate on word meanings with pictures. Thirdly, the current study did not elaborate on

letter-sound correspondences within target words. Both the teaching of supplementary

words and letter-sound correspondences may have contributed to the effectiveness of the

different instructional methods. Furthermore, the discussion of meaningful pictures

alongside meaningful sentences in the context condition might have been a necessary

component for learning the semantic and syntactic identities of the target words.

The multiple regression analyses reported in Table 9 show the unique variance

explained by training and beginning skills on posttest measures and test trial

performance. Though the instructional conditions did not show differences on posttests, participation in training did contribute to explaining variance on all posttest scores except one. This suggests that all of the training procedures affected word learning across skills related to word ID, sentence production, spelling, and syntactic awareness. The verb transformations posttest did not show unique variance explained by training, but it was explained by the verb transformations pretest. This suggests that exposure to the irregular past tense forms in print during training did not help children recognize the past tense forms. However, either their pretest knowledge of these verb forms or participation in the pretest assessment contributed to their performance when the task was repeated as a posttest. Variance in children's ability to learn to read the words on test trials during training was explained by their pretest word reading ability and their spelling ability. This suggests that children with better beginning spelling and reading skills were more successful in learning to read words during training.

Another potential source of the discrepancy between previous studies' findings and the current study's findings on differences in instructional approach may be sample characteristics. Ehri and Roberts (1979) compared context and isolation word instruction with first graders whose mean age was 7.1 years. Ehri and Wilce (1980) worked with first graders whose average age was around 6.7 years. These two previous studies worked with children who had more advanced literacy skills than children in the current study who were kindergartners. Ehri's (1976) study compared context and no-context instruction with different levels of readers from kindergarten (mean age about 6 years 1 month) and first grade (mean age 6 years 11 months). Though the current study did not gather exact ages, all children were in kindergarten or prekindergarten, self-identifying as

5 or 6 years old. Selection criteria were more specific than in the previous studies. Participation was limited to those with the foundational skills needed to learn to read target words during training but not already able to read the target words. The sample for the current study fell into the partial alphabetic phase, perhaps at the beginning of this phase. They knew many letters but were able to read few, if any, high frequency real words and could not decode nonwords. However, on average, they successfully wrote about half of the necessary letters for target words on spelling posttests.

Performance on the flash word ID and spelling posttests exemplified other important characteristics of these participants in the partial alphabetic phase. The average number of words that participants were able to read on test trial three was more than double what they were able to remember the next day during the flash word ID posttest. The task assessed sight word learning and present findings suggest that readers in the partial phase have limited capacity to remember sight words. This is likely due to their use of partial cues, often giving more weight to initial and final sounds. These patterns were also present in their spellings, where, on average, children identified a little more than half the individual letters but were able to spell less than a fifth of the whole words.

A study by Sargiani, Ehri, and Maluf (2019) taught Brazilian kindergartners two ways of reading two-letter C-V syllables. The children were classified as pre-alphabetic phase readers because, although they knew the names of at least 15 letters, they did not know letter sounds and generally were unable to read any words on pretests. One group was trained with a grapheme-phoneme (GP) strategy, where they pronounced separate phonemes and then blended them to form a syllable, and the other group was taught to pronounce the syllables as a whole (WS). Results showed that not only did children in the

GP group learn the CV syllables faster, but also they more accurately read longer words and pseudowords that contained those syllables when compared to the WS group. Even though the WS training focused solely on the syllables as a whole, they still did not read them as accurately as the GP group. This suggests that there is no implicit phonemic awareness training when only syllabic units are taught. But with a more systematic GP training, readers are able to successfully transfer their unitized letter-sound knowledge.

These findings are relevant because the training procedures in the current study trained the one-syllable words as whole words. The training did not teach children to use a grapheme-phoneme strategy for decoding the target words. However, the current study's participants were partial alphabetic readers, therefore more advanced than the Brazilian kindergartners and these readers may better extract letter sounds from whole word instruction. In a future study, the current study's training methods might be revamped to incorporate a grapheme-phoneme strategy, which should improve word reading test trial successes and posttest scores.

**Word type**. It was hypothesized that participants would perform better with function words than irregular past tense verbs during training and on posttests including flash word reading, spelling, sentence production, and syntactic awareness tasks. This hypothesis was based on the frequency with which function words appear in speech and print. It was predicted that greater prior exposure to function words would make them more familiar and easier to access in the posttests. Previous research has not compared specific types of context-dependent words. This makes results of the current study especially important. The pattern of results favoring function words over irregular past tense verbs was evident in all three instructional context conditions. Flash word reading

and spelling posttests showed that function words were easier to read and spell than past tense verbs. However, there was one exception to this pattern. Sentence production scores were higher for sentences created for past tense verbs compared to function words.

Participants across all instructional conditions scored higher on the sentence production task when they made sentences with past tense verbs as compared to function words. Past tense verbs might have been easier to use in sentences because, while they are somewhat abstract because they address the past, they still signify a specific action. If children are aware of that action, they should be able to construct a more meaningful mental picture during training. Whenever a word activates a vivid mental picture, it reinforces that picture and adds meaning for the listener (Sadoski, McTigue, & Paivio, 2012). With this reinforcement during training, children might have found it easier to talk about the meanings of the verbs by constructing spoken sentences containing them. If a child lacks a vivid mental picture of what a word means, which is likely the case with function words, then it would be much harder to use these words in sentences on demand. Additionally, past tense verbs might have more obvious lexical boundaries. They might be perceived as more real and self-contained than function words, whereas function words might be confused for parts of other words or simply background noise.

The most challenging function word for sentence production was BUT. Most notably, some children created sentences with this word's homonym, BUTT. This was the only function word that had a homonym, which, understandably creates another obstacle for young children trying to create a sentence. If a child knows there are two types of "but," both will become activated when the researcher gives this word to make a sentence. In many cases, the researcher gently reminded children, "This isn't the body

part, remember." But, even in cases where the child knows both meanings, they will have

to inhibit one of them. Because "butt" is a concrete noun, this makes it more meaningful

and hence more salient and likely to inhibit activation of "but." This inhibition would

make the process of creating a sentence with the less-meaningful, less-rich lexical unit

more difficult. Additionally, BUT is a conjunction, which serves to connect clauses or

coordinate events and things within a sentence. The function of a conjunction,

particularly BUT, which connects conflicting information in a sentence, might require

greater cognitive effort to use appropriately compared to other types of function words.

These findings build on previous evidence about learning context-dependent

words by distinguishing and comparing two types of context dependent words, function

words and past tense verbs. In Ehri's (1976) comparison of the learning of context-

dependent and context-free words, the context-free words, nouns and adjectives, took

fewer trials to learn than context-dependent words. There was also an interaction effect

for instructional method and word type in this study on the posttest that assessed sentence

creation. Participants who did not receive context training were not able to produce any

sentences for five of the nine context dependent words. However, this group was able to

produce sentences for the context-free words. Ehri concluded that beginning readers

struggle to discern context-dependent words as lexical units. Similarly, the current study

highlights that context-dependent function words suffer from this indistinctness.

There were no significant differences for word type on the syntactic awareness

task. This task presented both scrambled and meaningful sentences that contained the

target words. Children were asked, "Does that make sense?" after listening to each test

item, and they had the option to say yes or no. In general, performance on this task was

fairly high despite a few cases where children clearly did not understand the task. Further discussion of this task is described in the limitations section below.

**Educational Implications**

Findings from the current study are applicable in the classroom for early childhood educators. Most notably, word class can affect learning. Previous research supports that context-dependent words are more difficult to learn than context-independent words. The current study further specifies that within context-dependent words, past tense words and function words are learned differently. Function words were easier to recognize and spell while past tense verbs were easier to use in sentences. With this in mind, word lists that are taught in kindergarten should be examined for word type. Word lists in the early grades are typically constructed according to frequency in text, letter-sound patterns, or word families. The current study's findings suggest that teachers should also consider semantic and syntactic identities of words. When choosing to teach word lists based on word type, instruction should address the more difficult word identities pinpointed by the current study.

Children had more difficulty reading and spelling the past tense verbs when compared to the function words. To address this in teaching past tense verbs, teachers could focus instruction on the phonological and orthographic components. Exercises and activities that match letters or groups of letters with corresponding sounds will reinforce phonological awareness of the target words. Orthographic knowledge will also improve with letter-sound matching, in addition to word pattern/family analyses. Very likely irregular past tense forms should be paired with present tense forms and taught in contrasting sentences to draw attention to the relationship and the difference.

Findings showed that children had more difficulty creating sentences with function words than with past tense verbs. To address this in teaching function words, teachers could focus on sentence creation and word placement. Exercises and activities that use the function words in as many ways as possible will help distinguish them as individual units of language with specific, and often varied, purposes. Teaching function words, with their "function" in language at the forefront, will give new readers a sense of their syntactic and semantic identities and versatility.

The current study's procedures and posttests also provided some insights into appropriate literacy tasks and directions for this age group. One posttest that gave some children difficulty was the sentence production task. Some children immediately understood the directions and were able to create interesting and meaningful sentences. Some children seemed confused by the directions, and in difficult cases, directions were simplified into, "Can you tell me a story using the word __?" A few children first tried to spell the words aloud (and were redirected with success) and two children never seemed to understand what they were being asked to do. Sentence production tasks, and the directions that accompany them, are excellent linguistic activities for young children. These tasks spark discussions about language and increase metalinguistic awareness. Talking about "building" and "creating" sentences encourages the idea that language can be manipulated and words are units to be used as building blocks. Implementing exercises that require children to utilize specific words, such as context-dependent words, will sensitize their ears and eyes to the lexical boundaries of these more abstract units of language.

**Limitations and Future Research**

**Age.** The parental permission form in this study did not ask for the child's birthdate. As such, no exact ages could be calculated. While each child identified as either 5 or 6 years old, the exact months and days could not be determined. At this young age, months can make a substantial difference in literacy skills while a child is in school. Skibbe, Connor, Morrison, and Jewkes (2011) found that first and second years of preschool, and not chronological age, were systematically and cumulatively beneficial to children's decoding and letter knowledge. In the present study, the number of years a child had attended school may have affected their propensity to learn components of word knowledge. Future research with this age group should consider collecting data on both the chronological age and history of schooling.

**Imbalanced word type order groups.** Assignment of participants to counterbalanced conditions in learning one or the other word type first was not properly balanced. To verify that this imbalance did not affect learning, and also to verify that word type order did not affect word learning during training, an analysis was conducted. This was done because the possibility existed that learning function words first might help past tense verb learning later or learning past tense verbs first might help function word learning later. Using word reading data from training test trials, results of the ANOVA confirmed that the word type order and participant imbalance did not affect word learning.

**Pretests and posttests.** In the posttests of this study, children were asked to produce sentences using the target words. This sentence production task was not used in the screening/pretest process. Without an equivalent comparison prior to instruction, one

cannot determine whether instruction improved children's abilities to use the target words in a meaningful context. Poor performance by some children suggested that they were unfamiliar with this type of task. The ability to embed words in sentences is affected not only by knowledge of the target words, but also by an understanding of what a "sentence" is. In future research, this task could be improved by utilizing clearer instructions to help children grasp how to construct sentences.

Screener assessments included an abbreviated version of the Diagnostic Spelling Assessment (DSA) (Ganske, 2013), which asked for spellings of words based on orthographic and phonemic features. These words were selected from the DSA's list of words and did not include any of the current study's target words. In this study's posttests, children were asked to spell the target words. The lack of an equivalent spelling pretest made it difficult to compare orthographic knowledge about the target words before and after instruction. This decision was made because asking children to spell these words on a pretest might actually begin instruction before it was intended. As a result of hearing the words and attempting to write letters for the sounds, they would be mapping the words into memory. In future research, having children spell the target words as part of instruction might make it more effective. Furthermore, including this at different points in the instruction would be a good indicator of progress.

**Intensity of training.** One major limitation in the current study's design was the limited interaction and engagement that children had with these words during training. The eight exposures to each word did not result in robust word learning for the majority of participants. Word recognition at the end of the third test trial on training days averaged two successes out of six for past tense verbs and three successes out of six for

function words. Flash word reading scores the day after training showed large floor effects that suggest participants did not learn the words as sight words. Training for word sets was limited to one 15-20-minute session. Additional sessions may have allowed for more intense training, but also would have required more cooperation and accommodation from teachers and schools.

Overall, word learning was poor across conditions. In order to lift the floor for all participants in future research, training should be more intensive. One way to augment training would be to add a writing component. Writing unfamiliar words creates new connections in memory, strengthening orthographic knowledge, and also increases phonological memory through the practice of saying the word and spelling it at the same time. To preserve the meaningful context condition in a writing task, a cloze task could be given where children write the target words inside of meaningful sentences. With guidance during training, children would be attending to the added meaning activated by the sentences while engaging in activity of writing. Scrambled context participants might write the word on its own or as part of a list providing no meaningful context. Adding to the instruction would require additional training sessions to conform to the limit of 20 minutes per session.

Another possibility is to incorporate pictures to clarify the meanings of words, as described in Ehri and Wilce (1980). As noted previously, context-dependent words are particularly tough to visually illustrate, but using phrases containing these words with the pictures would help to cement their meanings and usage. This might help to differentiate Meaningful Context instruction and Scrambled instruction effects. Extension of training over multiple days would very likely create more noticeable word learning effects.

Repeated exposure, combined with writing, discussion, and possibly illustrations of the words, would certainly increase children's ability to remember the words and might also reveal differences in the instructional approaches that were not seen in the current study.

To compare to previous studies, Ehri and Wilce (1980) also used four trials for training ten target words. However, those trials covered words three times each, for a total of twelve exposures during training. Ehri and Roberts (1979) held training over three days for 16 target words. The words were covered a total of 16 times in the course of training. In the flashcard learning phase in Miles (2015), children studied six words over four study trials. Each trial covered a target word twice, for a total of eight exposures. The current study was most similar to Miles (2015), with four training trials totaling eight exposures for each target word, as well.

**Appropriateness of training.** To qualify for the current study, children needed to be in the partial alphabetic phase. Pretests showed that they knew most letter names but had limited sight word vocabularies and no pseudoword decoding ability. Also they produced partial spellings of words but few fully correct word spellings. However, their performance during training and on posttests raised doubt about the appropriateness of the intervention. Floor effects on the sight word posttest as well as fairly low word reading performance on test trials during training suggest that these readers might not have been skilled enough for the type of training that was used. Sargiani, Ehri, and Maluf (2019) found evidence that beginning readers do not implicitly induce grapheme-phoneme subunits when they receive extensive practice reading CV syllables as whole units. They needed explicit instruction in the use of grapheme-phoneme correspondences to learn to read CV syllables effectively. The current study's training procedure offered

only whole word instruction and feedback without any instruction in decoding letter-sounds comprising the words. Without this, word learning would expected to be limited.

In addition to increasing the intensity of training in extensions of the current study, as mentioned previously, participant selection could be changed to include more advanced readers. Miles (2015) found that, compared to partial alphabetic readers, full alphabetic readers performed better on an assessment of orthographic mapping of target words that were taught with training procedures similar to the current study. Readers who can recognize blends and other types of spellings patterns, like silent-*e*, might be better equipped to learn from the training procedures of the current study. One important consideration with this modification is that the target words from the current study would be too easy for full alphabetic readers. A future study might consider using nonwords or more advanced words, perhaps moving the list to five-letter words.

**Target words.** One issue with the chosen target words for this study was the use of the word BUT. This word was included to represent conjunctions as a type of function word. In many cases, children in the study mistook it for its homonym, BUTT. Some children were able to understand the idea that there are two types of "buts," but others were not able to move past it. In an extreme case, one child asked the researcher to stop saying the word when they were studying the function word set. She told the researcher that it upset her because it was a bad word. Other children seemed to understand BUT during training, but they could only think of the body part when it was time to produce a sentence. The distraction caused by this particular word suggests that a longer discussion about word meanings might have helped during instruction. Future research could also add a past tense verb/noun homophone to the past tense word set, such as LED. This

would help to determine if homophone characteristics were truly affecting word learning or if the reactions are unique to BUT/BUTT.

      **Script deviations.** There were two places where the researcher deviated from the procedure's script at some points during the study. The official script, as seen in Appendix C, did not have a protocol for addressing giggles, shocked reactions, and questions in response to the word BUT. When this happened, the researcher chose to tell the children, "This is not the body part, this is a different word." Similarly, when they were asked to produce a sentence with the word BUT, children who giggled or seemed surprised were also told, "Remember this is not the body part word." Unfortunately, the exact times this reminder was given was not recorded in the data. The presence of script deviations is important to note because it has the potential to introduce experimenter bias, particularly if the deviation is done without regard for balance between groups. The reminder about the word BUT added extra meaning to the word for those children who heard it. If the reminder was unintentionally given to children from one particular group, this could have confounded effects of instructional condition. According to posttest results, it is unlikely that this reminder affected outcomes. The word BUT was the most challenging word on the sentence production task, producing the lowest scores of any of the target words. To combat this issue in the future, clarifications about word meanings should not be added by the experimenter unless it is applied universally across conditions. Also, the researcher should consider how additional meaning clarification might affect the validity of the training conditions.

      The other noted instance of script deviation was when children did not understand the general instructions for the sentence production task. The researcher gave lots of time

for children to think about the instructions and would repeat the script if the child was silent more than 30 seconds. If the child still was unable to give any verbal response, the researcher tried to reword the instructions to something that might be more appropriate for the child's knowledge by saying, "Can you tell me a story with the word __?" Again, if this rewording of the instructions was given unevenly between training conditions, then this could have confounded performance results. Future reproductions of this study should include age- and skill-appropriate instructions on all tasks. Also, a decision should be made before data collection begins about whether to give a score of 0 when participants do not understand directions or if the experimenter should make additional attempts to gather the assessment data. If it is most important to gather the data, additional/alternative directions should be included for all participants.

**Flash word ID.** The floor effects present in the scores on the Flash Word ID task, across words and instructional conditions, suggest that this is a poor measure for this age group. Over a third of participants couldn't read any of the past tense verbs as sight words and two-thirds could not read any of the function words as sight words. Future research should include an additional measure of reading where the target word is displayed for an indefinite amount of time, allowing the child to make their best independent attempt at reading the word. An untimed reading task could come after the spelling task so as to not confound the spelling assessment.

**Sentence production task.** Some children had difficulty with the sentence production task. This was most noticeable when a child would begin trying to spell the target word out loud instead of using it in a sentence. At those times, the researcher would pause the child, and tell them this task was about using the word in a sentence or

putting it into a story. This helped correct some of the misunderstandings, but still some children struggled. Misunderstanding the directions in this task could be attributed to the child's lack of metalinguistic awareness and, in turn, their concepts of what words and sentences are. This would have affected the validity of the measurement because misunderstanding the task would be confounded with knowledge about how to use the word. Some children were able to use target words competently in speech while not being able to use them when asked specifically in this task. This is again representative of their overall lack of metalinguistic awareness because they were not aware that they were in fact able to use these words.

The sentence production task was used as a proxy for assessing semantic word knowledge. However, this assessment does not present a complete picture of a child's knowledge about the meaning of a word. Future iterations of this study could add measures that would better assess children's understandings of meaning, such as direct questions, "What does that mean?" or offering choices for words that mean the same thing or are related. Additionally, the sentence production scoring rubric could be expanded and made more sensitive by accounting for meaningful uses of the words. The current scoring model allotted full credit to sentences that were complete and grammatically correct, even if the meaning of the word was ambiguous within the sentence. It should be noted that this might be difficult to determine sometimes with sentences created by children because they often like to make silly sentences. For example, for the word INTO, one child said, "You are going into the sink drain" and then laughed. If sentence scores account for meaning within the sentence, then this response

would not receive full credit. Future sentence scoring rubrics could account for these purposeful extensions of word meaning.

This task also did not visually present the target word for the child. Seeing the word might help children use it in a sentence because it reinforces the word's lexical boundaries for the child. Seeing the word might have been particularly helpful to children in the Meaningful Context condition because the visual cue might help to connect their memory of the word study context, where they heard and read the word in a sentence. The reason the current study did not offer a visual presentation of the word for this task was because the spelling posttest followed directly after this task. The researcher did not want to undermine any potential differential effects of the training conditions on participant's memory of the orthographic features. However, with enough time in between tasks, or with brief exposure for the word in this task, or with reordering of the tasks, sentence production performance might improve.

**Syntactic awareness task.** The syntactic awareness task presented difficulties for a handful of participants. Children were supposed to listen to each five-word sequence (some were meaningful, others were scrambled) and say "yes" if it made sense and "no" if it didn't. The hypothetical statements confused a small group of the children. For some, they seemed to think they were supposed to assess whether each statement was factual. For example, after the statement, "She bumped into the girl" (which should have gotten a "Yes" response), one child responded by saying, "No. You can't bump into me." Additionally, some in this group misunderstood by trying to make sense out of the scrambled sentences by rewording them or talking about them. Other children struggled with this task as indicated by the randomness of their responses. These children seemed

to guess, and often gave the same response many times in a row. In those cases, scores showed they were performing at a chance level.

During this task, children were not shown the written word sequences while the researcher read them. Children had to listen to determine whether the words were in an order that made sense. Perhaps if they had seen the words while they were read, they might have recognized their connection to the training contexts, or seeing spellings might have activated recognition of the words they were taught. Following along in print while each word was spoken in the word sequences might also have helped children to understand the instructions that otherwise may have been too abstract when the sentences were only heard. Deciding whether visually presented words are "mixed up" or "in the right order" while they are being read aloud would further reinforce the task's goal. This would also assess syntactic awareness of the written forms of target words and therefore written text that corresponds to the spoken text should be presented during future iterations of this task.

**Verb transformations.** Both the verb transformations pretest and posttest were spoken assessments. Children listened while the researcher read about what someone likes to do first, then they heard two alternate statements about what that person did *yesterday*. The alternate statements were identical except for the verb: one option was incorrect, with the generalized -ed ending (e.g., TAKED) and one was the correct past tense verb. Participants were asked to choose which one "sounded right" and did that by repeating the whole statement or just saying the verb. Participants did not have access to the printed sentences or target words while this task was administered. An improvement that could be made on this task would be to present the alternate statements visually in

print while they are read. The target verbs could be underlined to alert the child to the only word changing between the two statement choices. This addition would help access the visual word memory that children gained from training, making it a better assessment of the training's effects.

**Conclusion**

The purpose of the present study was to determine the effect of different instructional conditions, a meaningful context condition, a scrambled context condition, and a combination condition, on context-dependent word learning with beginning readers. Two subtypes of context-dependent words were taught, past tense verbs and function words, and different aspects of word knowledge were assessed. Results of this study did not align with previous studies that altered instructional context in that there were no significant differences between instructional conditions on any assessments. Additional findings from this study include significant differences between the subtypes of context-dependent words. Function words were easier to read and spell while past tense verbs were easier to place into sentences. Educational implications include suggestions for literacy instruction to focus special attention on the spelling and recognition of irregular past tense verbs and also on the various ways function words are used in language. An extension of this study could increase the intensity of training to improve participants' overall word learning. More effective training, combined with control of exposure time to target words, would provide a more effective test of the hypothesis that when exposure time to target words is equated, differences between scrambled and meaningful context conditions do no influence target word learning. further support that instructional condition did not affect word learning.

**Appendix A**

**THE CITY UNIVERSITY OF NEW YORK**
The Graduate Center
Educational Psychology

PARENTAL PERMISSION FOR CHILD TO PARTICIPATE IN A RESEARCH STUDY

**Title of Research Study:** How Should Context-Dependent Words be Taught to Beginning Readers?

**Principal Investigator:** Abigail Turner, MPhil
PhD Candidate, Educational Psychology

**Faculty Advisor:** Linnea Ehri, PhD
Distinguished Professor

Your child is selected as a possible participant in this research study because he/she is a beginning reader.

**Purpose:**
The purpose of this research study is to examine different ways of teaching children how to read context-dependent words, that is, words that become meaningful when combined with other words in sentences, for example, "the". These words are more abstract and often harder for children to learn. The results of this study will help to inform instructional methods for the classroom.

**Procedures:**
If you agree to allow your child to participate in this research study, your child should return this permission form to their teacher. You will keep one copy for yourself.  As part of his/her participation in this study, and at a time and place determined appropriate by your child's teacher, your child will be asked to do the following:
- Identify letters, read words aloud to the investigator, and write spellings
    - 1 session, approximately 10-15 minutes
- Practice reading unfamiliar words with the investigator on cards
    - 2 sessions on 2 different days, approximately 15-20 minutes each
- Read words aloud from a computer screen, determine whether sentences they hear make sense, create their own sentences verbally, and write spellings
    - 2 sessions on 2 different days, approximately 20 minutes each

**Time Commitment:**
Your child's participation in this research study is expected to last for no more than 20 minutes during each session, for a total of 5 sessions.

**Potential Risks or Discomforts:**
Your child's participation in this study does not involve any more risk than what he/she might experience at school on a daily basis. These tasks are quite common in classrooms and

literacy activities. It is possible that your child will be unsure about some of the questions asked and this could cause feelings of frustration during participation, however, this is to be expected and your child will always be positively encouraged by the investigator to keep them motivated and on-task. Your child could also feel tired or restless during participation if a particular session feels long to them. If this happens, your child may take a break and return to the study's activities at a later time if he/she wishes. The investigator will let your child know he/she may choose to take a break and return to normal class activities. Breaches of data confidentiality and privacy are also possible risks in educational research; however, your child's responses and progress in this study will remain confidential through the use of codes, in place of names, on documents that include your child's responses. Sessions with your child will remain private and individualized with only the lead investigator present.

**Potential Benefits:**
- Your child may learn to read 12 new words through participation in this study.
- Your child will get individualized attention each session from the principal investigator, who is an experienced reading tutor and educator.
- The results from this study could help shape instructional methods for teaching words to beginning readers.

**Alternatives to Participation:**
If you or your child chooses not to participate in this study, your child will remain with the classroom teacher for the regularly scheduled school day.

**Payment for Participation:**
Your child will not receive any payment for participating in this research study.

**Confidentiality:**
We will make our best efforts to maintain confidentiality of any information that is collected during this research study, and that can identify your child. We will disclose this information only with your permission or as required by law.

We will protect your child's confidentiality by keeping the data in a secure office at the Graduate Center, where only the principal investigator and her advisor, Dr. Linnea Ehri, can access it. Identifiable participant data will be safeguarded using a coding system, where documents will be labeled with numbers instead of student names. The key identifying names with participant numbers will be accessible to only the principal investigator and her advisor.

The research team, authorized CUNY staff, and government agencies that oversee this type of research may have access to research data and records in order to monitor the research. Research records provided to authorized, non-CUNY individuals will not contain identifiable information about your child. Publications and/or presentations that result from this study will not identify your child by name.

**Participants' Rights:**

- Your child's participation in this research study is entirely voluntary. If you decide not to allow your child to participate, there will be no penalty to you, and you or your child will not lose any benefits to which you are otherwise entitled.
- You can decide to withdraw your permission and stop your child from participating in the research at any time, without any penalty.

**Questions, Comments or Concerns:**
If you have any questions, comments or concerns about the research, you can talk to one of the following researchers:

- Abigail Turner, principal investigator, aturner@gradcenter.cuny.edu or 443-623-1861
- Linnea Ehri, faculty advisor, lehri@gc.cuny.edu

If you have questions about your child's rights as a research participant, or you have comments or concerns that you would like to discuss with someone other than the researchers, please call the CUNY Research Compliance Administrator at 646-664-8918. Alternately, you can write to:

CUNY Office of the Vice Chancellor for Research
Attn: Research Compliance Administrator
205 East 42nd Street
New York, NY 10017

Or email:
hrpp@cuny.edu

**Signature of Parent(s) or Legal Guardian:**
If you give permission for your child to participate in this research study, "How Should Context-Dependent Words be Taught to Beginning Readers?" please sign and date below. You will be given a copy of this form to keep.

_____
_____
Printed Name of Parent or Legal Guardian          Printed     Name     of     Child
Participant

_____          _____
Signature of Parent or Legal Guardian                     Date

**Signature of Individual Obtaining Parental Permission**

_____
Printed Name of Individual Obtaining Parental Permission

_____          _____
Signature of Individual Obtaining Parental Permission          Date

**Appendix B**

Child Assent Script


**Researcher:**
Hi **[**Child's Name],
My name is Abbie. I am doing some activities with the children in your class and I was hoping you would want to do them, too. Your parents have already told me it is ok for you to work with me. We will be reading and spelling words together.

If you agree to work with me, I will not tell anyone else about your work, but you can tell people about it if you want. We will meet 4 more times after this, when your teacher says it's ok.

If you ever want to go back to class, just let me know, because we can stop at any time. No one will be mad at you if you don't want to do it. It is also ok to say yes now and change your mind later.

If you ever have any questions, you can ask me or someone else, like [child's teacher].

Do you have any questions about my study?
Do you want to participate in this study? [ask child to circle their response on the Child Assent form]


*Show the Child Assent form. Wait for child's response. If yes, continue. If no, ask if they would like to be invited on another day.*

**Appendix C**

Screener Scripts

<u>Letter ID</u>
**Researcher**: Great! This sheet shows you letters. I would like you to name all the letters you know. Start here (*point to the first row, upper left letter*). Move across the row and name all the letters you know, then move to the second row and name those, and so one. If you don't know a letter, you can guess or skip it.

*Hand child Letter ID Stimuli, capital letters first, lower case letters second. Move left to right, uncover rows as child progresses. Responses will be recorded on a score sheet. If the child is wrong, record what is said.*

<u>Word ID</u>
**Researcher:** Now I would like you to read some words. Some of these words are real words and some of them are silly words that I made up. I'll also show you pictures, and you can tell me what they are. You might know some of the words and you might not know some of them, that's ok. Try to read each word the best you can or you can say "I don't know." Are you ready?

*Present word ID stimuli. Move from left to right, uncover words as child progresses. Record responses on the score sheet (✔=correct, write incorrect response, or /=Idk). If the child says the word incorrectly, the researcher will record what was said. If the child looks to the researcher for an evaluation of performance, the researcher will respond to the child with "Let's do the next word," "Try the next one," "Let's keep going".*

*End with:* You did a good job, I'm proud of you for trying so hard.

<u>Spelling Pretest Assessment</u>
**Researcher:** Now I'm going to ask you to write some words that I have on this list. I'll tell you the word and you will try your best to write the word the way you think it's spelled. If you know how it is spelled, write that. If you don't know, then write the sounds you hear when you say the word. You can write your spellings on this paper.

*Hand child Spelling Assessment Response Sheet and pencil. Read words and sentences as follows:*

1.  The first word is WIN.
I think my team will **wi<u>n</u>** the game.
2.  The next word is MUCH.
I enjoyed the music so **mu<u>ch</u>**.
3.  The next word is BET.
I **b<u>et</u>** you will finish the book today.
4.  The next word is GRAB.
She had to **<u>grab</u>** her hat so it didn't blow away.

5.  The next word is DISH.
That **d<u>i</u>sh** should be washed in the sink.
6.  The next word is FEAR.
He has a **<u>fear</u>** of the dark.
7.  The next word is YAWN.
I saw the dog **y<u>aw</u>n** when he was sleepy.
8.  The next word is SMOKE.
The **sm<u>oke</u>** from the chimney was gray.

<u>Verb Transformations</u>

**Researcher:** In this task, I am going to tell you what some people like to do. Then I'll say two sentences that describe what they did yesterday, and only one is correct. So, I will give you two choices and you should pick the one that sounds right. Here are some examples to show you what to do.

*Read models with prompts, provide corrective feedback.*

*WENT/GO'ED*
Sometimes Susan likes to GO to the park.
*Now which one of these sounds right.*
Last Friday, Susan WENT to the park.
Last Friday, Susan GO'ED to the park.
Which one is correct?
*Repeat options if necessary. Provide corrective feedback, if necessary.*

*RAN/RUNNED*
Sometimes Ava likes to RUN home from school.
Yesterday Ava RUNNED home from school.
Yesterday Ava RAN home from school.
*Provide corrective feedback.*

*ATE/EATED*
Sometimes John likes to EAT cake.
Last night John ATE a piece of cake.
Last night John EATED a piece of cake.
*Provide corrective feedback.*

*Now read the target word prompts and record accuracy on Pretest Verb Transformations Record Sheet.*

*KEPT/KEEPED*
Sometimes Ben likes to KEEP his cookies for a snack.
Yesterday, Ben KEEPED his cookies for a snack.
Yesterday, Ben KEPT his cookies for a snack.

*CAME/COMED*
Sometimes Emily likes to COME with us to school.
Yesterday Emily CAME with us to school.
Yesterday Emily COMED with us to school.

*TOOK/TAKED*
Sometimes Aidan likes to TAKE the bus to school.
Yesterday, Aidan TAKED the bus to school.
Yesterday, Aidan TOOK the bus to school.

*HELD/HOLDED*
Sometimes Olivia likes to HOLD her pet snake.
Yesterday, Olivia HELD her pet snake.
Yesterday, Olivia HOLDED her pet snake.

*GOT/GETTED*
Sometimes Luka likes to GET candy from the store.
Yesterday, Luka GETTED candy from the store.
Yesterday, Luka GOT candy from the store.

*TOLD/TELLED*
Sometimes, Isabella likes to TELL stories to her teacher.
Yesterday, Isabella TOLD a story to her teacher.
Yesterday, Isabella TELLED a story to her teacher.

**Appendix D**

Screener Record Sheets

#_____                                                    Date: _____

Record a check if the child has correctly identified the letter name (LN) or letter sound (LS).

|  | Correct | | Notes |
|---|---|---|---|
|  | LN | LS |  |
| a |  |  |  |
| f |  |  |  |
| k |  |  |  |
| p |  |  |  |
| w |  |  |  |
| b |  |  |  |
| h |  |  |  |
| o |  |  |  |
| j |  |  |  |
| u |  |  |  |
| *a* |  |  |  |
| c |  |  |  |
| y |  |  |  |
| l |  |  |  |
| m |  |  |  |
| d |  |  |  |
| n |  |  |  |
| s |  |  |  |
| x |  |  |  |
| i |  |  |  |
| e |  |  |  |
| *g* |  |  |  |
| r |  |  |  |
| v |  |  |  |
| t |  |  |  |
| g |  |  |  |

Screener Word ID Record Sheet

#_____                                                                      Date: _____

Record a check if word is read correctly. Record child's response if they are incorrect.
Record a slash (/) if child says, "I don't know" or asks to skip.

| | Correct | Incorrect, said: | | Correct | Incorrect, said: | | Correct | Incorrect, said: |
|---|---|---|---|---|---|---|---|---|
| big | | | fes | | | the | | |
| down | | | come | | | into | | |
| can | | | but | | | from | | |
| bave | | | little | | | tirl | | |
| held | | | must | | | not | | |
| got | | | gid | | | kept | | |
| go | | | took | | | red | | |
| came | | | het | | | told | | |
| in | | | with | | | we | | |

Target words: _____/12

High frequency: ____/10

Nonwords: _____/5

Screener/Pretest Verb Transformations Record Sheet

#_____                                                    Date: _____

Record a check in the second column if response is correct.

|          | Correct? |
|----------|----------|
| 1. kept  |          |
| 2. came  |          |
| 3. took  |          |
| 4. held  |          |
| 5. got   |          |
| 6. told  |          |

Total correct:   /6

**Appendix E**

Screener Letter ID

a f k p w

b h o j u

c y l ɑ m

d n s g i

e g r v t

**Appendix F**

Screener Word ID

| big | fes | the |
|-----|-----|-----|
| down | come | into |
| can | but | from |
| bave | little | tirl |
| held | must | not |
| got | gid | kept |
| go | took | red |
| came | het | told |
| in | with | we |

Note: Color differentiation is for review purposes only. All words were presented in black for study procedures.

**Appendix G**

Screener Spelling Stimuli

| Word | Target Letters | Sentence |
|------|----------------|----------|
| 1. WIN | N | I think my team will **win** the game. |
| 2. MUCH | CH | I enjoyed the music so **much**. |
| 3. BET | E | I **bet** you will finish the book today. |
| 4. GRAB | GR | She had to **grab** her hat so it didn't blow away. |
| 5. DISH | SH | That **dish** should be washed in the sink. |
| 6. FEAR | EA | He has a **fear** of the dark. |
| 7. YAWN | AW | I saw the dog **yawn** when he was sleepy. |
| 8. SMOKE | O_E | The **smoke** from the chimney was gray. |

Screener Spelling Response Sheet

\#_____                                                            Date: _____

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

**Appendix H**

Training Scripts

## For SCRAMBLED condition

**Researcher:** Today we will read some words together. Your job will be to remember how to read the words. First you will see one word on a card to read. Then you will see several words on another card to read. Then I'll ask you to point to one of the words. We'll practice the words several times so you can remember how to read them. Are you ready? *Wait for child's response.*

**Instruction- SCRAMBLED (1ˢᵗ trial, use Set A sentences)**
1) *Only show word card. Point to word.*
    This word is TOLD. Say TOLD and point to it.
2) *Wait for child to repeat word correctly and point.*
3) *Present scrambled sentence card for target word.*
    Now I am going to read the words on this card and then you'll copy how I read them.
4) *Read scrambled sentence card while pointing to each word.*
    "Mom my story told I the."
    Now you do it and point to the words as you read them.
5) *Wait for child to point to each word on the card. Record child's accuracy in reading while fingerpointing each word. Provide assistance if necessary.*
6)    Now point to TOLD and read it aloud.
    *Record accuracy. If child was incorrect, point to word and reread it aloud.*
7)    OK, it's time for our next word.
    *Move onto next word in set. Repeat instruction procedures with each word in the set.*

**Assessment – SCRAMBLED (2ⁿᵈ and following trials, Sets B, C, D, A,…)**
1) *Only show word card.*
    Read this word.
2) *Record accuracy. If wrong, tell child the word.*
3) *Show scrambled sentence card while pointing to each word.*
    "raining me that told he it's"   Now you do it.
4) *Record child's accuracy in reading while fingerpointing the words.*
1)     Now point to TOLD and read it aloud.
    *Record accuracy. If incorrect, point to target word and read it.*

### For CONTEXT condition

**Researcher:** Today we will read some words together. Your job will be to remember how to read the words. First you will see one word on a card to read. Then you will see several words on another card to read. Then I'll ask you to point to one of the words. We'll practice the words several times so you can remember how to read them. Are you ready? *Wait for child's response.*

### Instruction-CONTEXT (1st trial, use Set A sentences)
1) *Only show word card. Point to word.*
    This word is TOLD. Say TOLD and point to it.
2) *Wait for child to repeat word correctly and point.*
3) *Present meaningful sentence card for target word.*
    Now I am going to read the words on this card and then you'll copy how I read them.
4) *Read sentence card while pointing to each word.*
    "I told my mom the story."
    Now you do it and point to the words as you read them.
5) *Wait for child to point to each word on the card. Record child's accuracy in reading while fingerpointing each word. Provide assistance if necessary.*
6)    Now point to TOLD and read it aloud.
    *Record accuracy. If child was incorrect, point to word and reread it aloud.*
7)    OK, it's time for our next word.
    *Move onto next word in set. Repeat instruction procedures with each word in the set.*

### Assessment – CONTEXT (2nd and following trials, Sets B, C, D, A, B, C, D)
1) *Only show word card.*
    Read this word.
2) *Record accuracy. If wrong, tell child the word.*
3) *Show meaningful sentence card while pointing to each word.*
    "He told me that it's raining."   Now you do it.
4) *Record child's accuracy in reading while fingerpointing the words.*
5)    Now point to TOLD and read it aloud.
    *Record accuracy. If incorrect, point to target word and read it.*

**For COMBINATION condition**

Random assignment will determine whether Researcher should begin the treatment with SCRAMBLED instruction or CONTEXT instruction. Groups are identified as SCRAMBLED FIRST or CONTEXT FIRST.

**Researcher:** Today we will read some words together. Your job will be to remember how to read the words. First you will see one word on a card to read. Then you will see several words on another card to read. Then I'll ask you to point to one of the words. We'll practice the words several times so you can remember how to read them. Are you ready? *Wait for child's response.*

**Instruction-COMBINATION-SCRAMBLED FIRST** (1st trial, use Set A)

1) *Only show word card. Point to word.*
        This word is TOLD. Say TOLD and point to it.
2) *Wait for child to repeat word correctly and point.*
3) *Present scrambled sentence card for target word.*
        Now I am going to read the words on this card and then you'll copy how I read them.
4) *Read scrambled sentence card while pointing to each word.*
        "Mom my story told I the."
        Now you do it and point to the words as you read them.
5) *Wait for child to point to each word on the card. Record child's accuracy in reading while fingerpointing each word. Provide assistance if necessary.*
6)      Now point to TOLD and read it aloud.
    *Record accuracy. If child was incorrect, point to word and reread it aloud.*
7)      OK, it's time for our next word.
    *Move onto next word in set. Repeat instruction procedures with each word in the set.*

**Assessment-COMBINATION-SCRAMBLED FIRST** (2nd+ trials)
Set order: B C, D, B, A, D, C (see Combination Sentence Sets x Trials Table)

1) *Only show word card.*
        Read this word.
2) *Record accuracy. If wrong, tell child the word.*
3) *Show meaningful sentence card while pointing to each word.*
        "He told me that it's raining."   Now you do it.
4) *Record child's accuracy in reading while fingerpointing the words.*
5)      Now point to TOLD and read it aloud.
    *Record accuracy. If incorrect, point to target word and read it.*

---

**Instruction–COMBINATION–CONTEXT FIRST** (1ST Trial, use Set A)

1) *Only show word card. Point to word.*

      This word is TOLD. Can you say TOLD and point to it?
2) *Wait for child to repeat word correctly and point.*
3) *Present meaningful sentence card for target word.*
      Now I am going to read the words on this card and then you'll copy how I read them.
4) *Read sentence card while pointing to each word.*
      "I told my mom the story."
      Now you do it and point to the words as you read them.
5) *Wait for child to point to each word on the card. Record child's accuracy in reading while fingerpointing each word. Provide assistance if necessary.*
6)       Now point to TOLD and read it aloud.
   *Record accuracy. If child was incorrect, point to word and reread it aloud.*
7)       OK, it's time for our next word.
   *Move onto next word in set. Repeat instruction procedures with each word in the set.*

**Assessment–COMBINATION–CONTEXT FIRST** (2nd + trials)
Set order: B, C, D, B, A, D, C (see Combination Sentence Sets x Trials Table)

1) *Only show word card.*
      Read this word.
2) *Record accuracy. If wrong, tell child the word.*
3) *Show scrambled sentence card while pointing to each word.*
      "raining me that told he it's"   Now you do it.
4) *Record child's accuracy in reading while fingerpointing the words.*
5)       Now point to TOLD and read it aloud.
   *Record accuracy. If incorrect, point to target word and read it.*

**Appendix I**
Instructional/Training Record

#_____                                                        Date: _____

**Past Tense Verbs**

**Introductory Trial**

|        | Completed |
|--------|-----------|
| kept   |           |
| came   |           |
| took   |           |
| told   |           |
| held   |           |
| got    |           |

**Test Trial 1**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| kept   |         |                  |
| came   |         |                  |
| took   |         |                  |
| told   |         |                  |
| held   |         |                  |
| got    |         |                  |

**Test Trial 2**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| kept   |         |                  |
| came   |         |                  |
| took   |         |                  |
| told   |         |                  |
| held   |         |                  |
| got    |         |                  |

**Test Trial 3**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| kept   |         |                  |
| came   |         |                  |
| took   |         |                  |
| told   |         |                  |
| held   |         |                  |
| got    |         |                  |

Instructional/Training Record

#_____                                                          Date: _____

**Function Words**

**Introductory Trial**

|        | Completed |
|--------|-----------|
| with   |           |
| from   |           |
| must   |           |
| down   |           |
| into   |           |
| but    |           |

**Test Trial 1**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| with   |         |                  |
| from   |         |                  |
| must   |         |                  |
| down   |         |                  |
| into   |         |                  |
| but    |         |                  |

**Test Trial 2**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| with   |         |                  |
| from   |         |                  |
| must   |         |                  |
| down   |         |                  |
| into   |         |                  |
| but    |         |                  |

**Trial 3**

|        | CORRECT | INCORRECT, said… |
|--------|---------|------------------|
| with   |         |                  |
| from   |         |                  |
| must   |         |                  |
| down   |         |                  |
| into   |         |                  |
| but    |         |                  |

**Appendix J**

Posttest Scripts

<u>Flash Word ID</u>
**Researcher:** Today you'll see some words appear on this screen. You will only see each word for a short time. Your job will be to read the words you recognize. You need to pay close attention to the screen so you can read the words before they disappear. Read them out loud for me. First we'll do some practice words so you can see how it works.

*Begin practice set of 4 flash words on presentation (a, cat, the, big). Provide feedback on reading the words aloud and ensure child understands task.*

*Begin Flash Word ID assessment when child indicates they are ready. Place a check on the score sheet if the child is correct. Record misreadings.*

<u>Sentence Production</u>
**Researcher:** For this next activity, I'm going to say each of the words you learned and you are going to make up a sentence using that word.

Let me give you an example. If I gave you the word "jump", you could make up a sentence like, "I can jump really high in the air." Now you make up a sentence with the word "jump" in it.

*Give corrective feedback or confirm it was correct.*
*Read off list according to most recent training session (Verbs or Function Words)*
Ok, now I'll ask you to make up some more on your own. Make up a sentence that has the word <u>TOLD</u> in it.

*Provide feedback or encouragement to make a complete sentence if the child produces an incomplete sentence.*

The next word is <u>CAME</u>. Make up a sentence that has the word <u>CAME</u> in it.

*Continue this procedure with all the target words.*

<u>Spelling</u>
**Researcher:** Now I'm going to ask you to remember the spellings of the words that you practiced yesterday. You will write them on this paper. I can't help you spell them, so just write the letters you remember.

*Hand child Past Tense Verbs or Function Words Spelling Posttest Response Sheet.*

The first word is _____.  *Give sufficient time to spell the word.*
The second word is _____.  *Give sufficient time.*

| Function Words | Past Tense Verbs |
|---|---|
| 1. down | 1. told |
| 2. but | 2. came |
| 3. must | 3. kept |
| 4. with | 4. took |
| 5. from | 5. held |
| 6. into | 6. got |

Syntactic Awareness Task

*Following past tense verb training, administer* Past Tense Verb Syntactic Awareness Task. *Following function word training, administer* Function Word Syntactic Awareness Task.

**Researcher:** In this next activity, I am going to read many sentences. Some of them will make sense and some of them won't. After I read each sentence, I'll ask you, "Does that make sense?" If the words are in the right order and the sentence makes sense, tell me "Yes." But if the words are out of order and it doesn't make sense or doesn't sound right, then tell me "No."

First, we'll try some practice sentences. Ready? Ok.

*Function word posttests, Example #1:*
> Light I off the turned. *(Pause.)*  Does that make sense?
> *Provide corrective feedback if necessary.*
> *Function word posttests, Example #2:*
> He likes ham and cheese sandwiches. *(Pause.)* Did that sentence make sense?
> *Provide corrective feedback if necessary, continue onto test items if correct.*

*Past tense verb posttests, Example #1:*
> She used the shovel to dig. *(Pause.)*  Does that make sense?
> *Past tense verb posttests, Example #2:*
> The Saturday on ate cake we. *(Pause.)* Did that sentence make sense?
> *Provide corrective feedback if necessary, continue onto test items if correct.*

*Read test items.*

*Ask,* Does that make sense?
*Alternatively, or as a follow-up if no response, ask*, Does that sound right?
*Record response on record sheet.*

*Read the next sequence, ask, and record. Repeat for all sequences listed.*

Verb Transformations

*This task is only administered as a posttest following past tense verb training. It will be skipped if the participant just finished function word training.*

**Researcher:** In this task, I am going to tell you what some people like to do. Then I'll tell you two different sentences that describe what they did yesterday, and only one is correct. I will give you two choices and you should pick the one that sounds right. Here are some examples to show you what to do.

*Read models and prompts, give corrective feedback.*

*WENT/GO'ED*
Sometimes Susan likes to GO to the park.
*Now which one of these sounds right.*
Yesterday, Susan WENT to the park.
Yesterday, Susan GO'ED to the park.
Which one is correct?
*Provide corrective feedback, if necessary.*

*RAN/RUNNED*
Sometimes Ava likes to RUN home from school.
Yesterday Ava RUNNED home from school.
Yesterday Ava RAN home from school.
*Provide corrective feedback.*

*ATE/EATED*
Sometimes John likes to EAT cake.
Yesterday John ATE a piece of cake.
Yesterday John EATED a piece of cake.
*Provide corrective feedback.*

*Now read the target word prompts and record accuracy on* Posttest Verb Transformations Record Sheet.

*KEPT/KEEPED*
Sometimes Ben likes to KEEP his cookies for a snack.
Yesterday, Ben KEEPED his cookies for a snack.
Yesterday, Ben KEPT his cookies for a snack.

*CAME/COMED*
Sometimes Emily likes to COME with us to school.
Yesterday Emily CAME with us to school.
Yesterday Emily COMED with us to school.

*TOOK/TAKED*
Sometimes Aidan likes to TAKE the bus to school.
Yesterday, Aidan TAKED the bus to school.
Yesterday, Aidan TOOK the bus to school.

*HELD/HOLDED*
Sometimes Olivia likes to HOLD her pet snake.
Yesterday, Olivia HELD her pet snake.
Yesterday, Olivia HOLDED her pet snake.

*GOT/GETTED*
Sometimes Luka likes to GET candy from the store.
Yesterday, Luka GETTED candy from the store.
Yesterday, Luka GOT candy from the store.

*TOLD/TELLED*
Sometimes, Isabella likes to TELL stories to her teacher.
Yesterday, Isabella TOLD a story to her teacher.
Yesterday, Isabella TELLED a story to her teacher.

**Appendix K**

Posttest Record Sheets

Posttest Flash Word ID Record Sheet – Past Tense Verbs

#_____                                                    Date:_____

| | Correct? | Other response? |
|---|---|---|
| told | | |
| big | | |
| came | | |
| bave | | |
| gid | | |
| kept | | |
| in | | |
| took | | |
| fes | | |
| got | | |
| can | | |
| held | | |
| go | | |
| come | | |

Record a check for a correct response. If no, record response. If no response, leave blank.

Note: Color differentiation is for review only. Words were displayed in black for task.

Total past tense verbs correct:    /6

Posttest Flash Word ID Record Sheet – Function Words

#_____                                          Date:_____

Record a check for a correct response. If no, record response. If no response, leave blank.

|        | Correct? | Other response? |
|--------|----------|-----------------|
| but    |          |                 |
| not    |          |                 |
| down   |          |                 |
| little |          |                 |
| het    |          |                 |
| with   |          |                 |
| tirl   |          |                 |
| must   |          |                 |
| the    |          |                 |
| into   |          |                 |
| we     |          |                 |
| from   |          |                 |
| red    |          |                 |

Note: Color differentiation is for review only. Words were displayed in black for task.

Total function words correct:    /6

Posttest Sentence Production Record Sheet – Past Tense Verbs

#_____                                                                    Date: _____


Record sentences below.

To rate sentences:

    (0) = did not respond, used word incorrectly

    (1) = used word correctly in a phrase but not a complete sentence (e.g., missing a
        subject or verb) OR used present tense form of the target past tense verb in a
        complete sentence (e.g., I hold a baby.)

    (2) = used word correctly in a sentence

|     | Target Word | Sentence Rating #1 | Rating #2 |
| --- | --- | --- | --- |
| 1.  | told  |  |  |
| 2.  | came  |  |  |
| 3.  | kept  |  |  |
| 4.  | took  |  |  |
| 5.  | held  |  |  |
| 6.  | got   |  |  |

1.

2.

3.

4.

5.

6.

Posttest Sentence Production Record Sheet – Function Words

\#_____                                                                              Date: _____

Record sentences below.

To rate sentences:

    (0) = did not respond, used word incorrectly

    (1) = used word correctly in a phrase but not a complete sentence (e.g., missing a subject or verb) OR used present tense form of the target past tense verb in a complete sentence (e.g., I hold a baby.)

    (2) = used word correctly in a sentence

|     | Target Word | Sentence Rating #1 | Rating #2 |
| --- | ----------- | ------------------ | --------- |
| 1.  | down        |                    |           |
| 2.  | but         |                    |           |
| 3.  | must        |                    |           |
| 4.  | with        |                    |           |
| 5.  | from        |                    |           |
| 6.  | into        |                    |           |

1.

2.

3.

4.

5.

6.

Posttest Spelling Response Sheet

#_____                                              Date:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Posttest Syntactic Awareness Task Record Sheet – Past Tense Verbs

#_____ Date: _____

Read sequence aloud. Ask if it makes sense. Circle in the correct response column if response is correct. Record notes if additional responses are relevant.

|  | Sequence | Correct Response | Notes | Score (0/1) |
|---|---|---|---|---|
| 1. | They *told* me the password. | Y | | |
| 2. | He *took* the toys. | Y | | |
| 3. | We *held* hands while walking. | Y | | |
| 4. | Snacks after *got* they school. | N | | |
| 5. | You on very *held* tight. | N | | |
| 6. | They *got* snacks after school. | Y | | |
| 7. | We *came* here to visit. | Y | | |
| 8. | She *told* secrets to everyone. | N | | |
| 9. | Shoes *got* new some he. | N | | |
| 10. | Here to *came* visit we. | N | | |
| 11. | You *held* on very tight. | Y | | |
| 12. | He *got* some new shoes. | Y | | |
| 13. | The *kept* ball red I. | N | | |
| 14. | The *told* password me they. | N | | |
| 15. | Open she the *kept* bottle. | N | | |
| 16. | Secrets to everyone *told* she. | N | | |
| 17. | They *took* the keys. | Y | | |
| 18. | To the *came* you house. | N | | |
| 19. | The *took* keys they. | N | | |
| 20. | I *kept* the red ball. | Y | | |
| 21. | Hands walking while *held* we. | N | | |
| 22. | She *kept* the bottle open. | Y | | |
| 23. | Toys *took* he the. | N | | |
| 24. | You *came* to the house. | Y | | |

Total correct for past tense verbs:   /24

Posttest Function Words Syntactic Awareness Task Record Sheet

#_____                                                      Date: _____

Read sequence aloud. Ask if it makes sense. Circle in the correct response column if response is correct. Record notes if additional responses are relevant.

|     | Sequence | Correct Response | Notes | Score (0/1) |
| --- | --- | --- | --- | --- |
| 1. | I found a note *from* mom. | Y | | |
| 2. | She wants *with* a spots dog. | Y | | |
| 3. | You *must* share crayons. | Y | | |
| 4. | The went to *down* store he | N | | |
| 5. | Cheese like *with* burgers we. | N | | |
| 6. | You can whisper *but* don't yell. | Y | | |
| 7. | We get *into* the pool. | Y | | |
| 8. | She wants a dog *with* spots. | Y | | |
| 9. | The *from* bakery was it. | N | | |
| 10. | You can don't *but* yell whisper | N | | |
| 11. | Dad said we *must* be good. | Y | | |
| 12. | I found mom a *from* note. | N | | |
| 13. | He went *down* to the store. | Y | | |
| 14. | Share *must* crayons you. | N | | |
| 15. | No one *but* called answered he. | N | | |
| 16. | She bumped *into* the girl. | Y | | |
| 17. | Fell it stairs *down* the | N | | |
| 18. | It was *from* the bakery. | N | | |
| 19. | We like burgers *with* cheese. | Y | | |
| 20. | Dad said *must* good we be | N | | |
| 21. | Bumped she girl *into* the. | N | | |
| 22. | He called *but* no one answered. | Y | | |
| 23. | Get pool the *into* we. | N | | |
| 24. | It fell *down* the stairs. | Y | | |

Total correct for function words:   /24

Posttest Verb Transformations Record Sheet

#_____                                          Date: _____

Record a check in the second column if response is correct.

|  | Correct? |
|---|---|
| 1. KEEP |  |
| 2. CAME |  |
| 3. TOOK |  |
| 4. HELD |  |
| 5. GOT |  |
| 6. TOLD |  |

Total correct:   /6

**Appendix L**

Posttest Syntactic Awareness Task Sentences Past Tense Verb

| | Correct | Incorrect |
|---|---|---|
| 1. | We *held* hands while walking. | Hands walking while *held* we. |
| | You *held* on tight. | On *held* tight you. |
| 2. | He *took* the toys. | Toys *took* he the. |
| | They *took* the keys. | The *took* keys they. |
| 3. | They *got* snacks after school. | Snacks after *got* they school. |
| | He *got* new shoes. | Shoes *got* new he. |
| 4. | She *told* secrets to everyone. | Secrets to everyone *told* she. |
| | They *told* me the password. | The *told* password me they. |
| 5. | I *kept* the red ball. | The *kept* ball I. |
| | She *kept* the bottle open. | Open she the *kept* bottle. |
| 6. | We *came* here to visit. | Here to *came* visit we. |
| | You *came* to the house. | To the *came* you house. |

*Note*. Order and organization are for review purposes only. For task administration, sequence order was randomized into a single list on the Past Tense Verb Syntactic Awareness Task Record Sheet.

Posttest Syntactic Awareness Task Sentences Function Word

|  | Correct | Incorrect |  |
|---|---|---|---|
| 1. | Dad said we *must* be good. | Dad said *must* good we be |  |
|  | You *must* share crayons. | Share *must* crayons you. |  |
| 2. | You can whisper *but* don't yell. | You can don't *but* yell whisper |  |
|  | He called *but* no one answered. | No one *but* called answered he. |  |
| 3. | She wants a dog *with* spots. | She wants *with* a spots dog. |  |
|  | We like burgers *with* cheese. | Cheese like *with* burgers we. |  |
| 4. | I found a note *from* mom. | I found mom a *from* note |  |
|  | It was *from* the bakery. | The *from* bakery was it. |  |
| 5. | It fell *down* the stairs. | fell it stairs *down* the |  |
|  | He went *down* to the store. | the went to *down* store he |  |
| 6. | We get *into* the pool. | get pool the *into* we. |  |
|  | She bumped *into* the girl. | Bumped she girl *into* the. |  |

Note: Order and organization are for review purposes only. For task administration, sequence order has been randomized into a single list on the Function Word Syntactic Awareness Task Record Sheet.

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