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Morphological Awareness Dynamic Assessment Task in Third Grade Children: A Feasibility Study

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MORPHOLOGICAL AWARENESS DYNAMIC ASSESSMENT TASK IN THIRD GRADE CHILDREN: A FEASIBILITY STUDY

by

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of the requirements for the degree
of

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Abstract

Purpose: The purpose of this study was to determine whether a) a morphological awareness dynamic assessment task is a sensitive instrument and reveals a range of performance in third grade children, and b) performance on a morphological awareness dynamic assessment task may be significantly improved with dynamic scaffolding.

Method: The participants included twenty-three typically developing third-grade children from an elementary school in the Intermountain West. The morphological awareness dynamic assessment task, adapted from Larsen and Nippold (2007), was administered to each child two times (Initial Trial 1 testing and a subsequent Trial 2 testing 3 days later). This task required children to use their knowledge of familiar base words and suffixes to infer meanings of uncommon, morphologically complex words. The 16 stimulus items were administered with a series of increasingly helpful scaffolds to help facilitate morphological awareness knowledge.

Results: Results revealed a wide range of test performance for children with large standard deviations. A within subject paired sample t-test revealed a statistically significant improvement in scores between Trial 1 and 2 of the morphological awareness dynamic assessment task with 87% of participants demonstrating a positive change or perhaps learning secondary to scaffolds.

Implications: The findings of this study indicate that dynamic assessment may be used as a sensitive test to discriminate a range of performance and may provide treatment insights for individuals with and without literacy deficits.

Table of Contents

Lists of Tables and Appendix

Morphological awareness is the ability to understand and manipulate the smaller meaningful parts that build words such as prefixes, roots, and suffixes (Carlisle & Nomanbhoy, 1993; Jarmulowicz, Taran, & Hay, 2007; Kuo & Anderson, 2006; Nagy, Berninger, & Abbott, 2006). For example, morphological awareness is demonstrated when a child understands that the word *talking* is made up of two distinct meaningful parts (the base word *talk* and the suffix *–ing*). Research has shown that morphological awareness skills contribute to literacy development in the primary years (Carlisle, 1995, 2000; Carlisle & Nomanbhoy, 1993; Nagy et al., 2006; Wolter, Wood, & D'zatko, 2009). Additionally, researchers have found links between morphological awareness, and the literacy skills of sight word reading, decoding, reading comprehension, and spelling (Carlisle, 1995, 2000; Carlisle & Nomanbhoy, 1993; Jarmulowicz, Hay, Taran, & Ethington, 2008; Kirk & Gillon, 2009; Mahony, Singson, & Mann, 2000; Singson, Mahony, & Mann, 2000; Wolter et al., 2009). Within the aforementioned studies, various static measurements have been used to measure morphological awareness which have resulted in conflicting findings. Recently, Larsen & Nippold (2007) developed a morphological awareness dynamic assessment task which may be a sensitive tool for assessing morphological awareness as well as valuable in indentifying the degree of morphological instructional support that is needed for school-age children. This assessment tool, however, has only been tested on sixth-grade children and more research needs to be conducted to test the validity of such an assessment. Thus, the purpose of this study was to determine whether a) a morphological awareness dynamic assessment task is a sensitive instrument and reveals a range of performance in third grade children, and b) performance on a morphological awareness dynamic assessment task may be significantly improved with dynamic scaffolding.

Morphological Awareness Development

The study of morphological word structure can include the investigation of inflections and derivations. Inflections are specific suffixes that change plurality, possession or tense. The awareness of inflectional morphology has been demonstrated by young children, even before they are in kindergarten. Conversely, derivational morphology includes the study of affixes and prefixes which change word class (e.g., the verb *act* to the noun *actor*) and typically develops later, with the majority of derivational morphology development starting in third grade. Derivations have been shown to be related to literacy development and take longer to master (Carlisle, 1995; Jarmulowicz et al., 2008; Masterson & Apel, 2007). Derivational morphemes can include transparent and opaque forms. Transparent derivatives are created when the relationship between the base word and the derived word has no phonological or orthographic changes (e.g., *teach* and *teacher*). Opaque derivatives are formed when the relationship between the base word and the derived word includes an orthographic or phonological change or both (e.g., *long* to *length*) (Wolter et al., 2009).

Relationship between Morphological Awareness, Language and Literacy

Many of the words that are morphologically complex can be made simpler and more predictable by understanding the meanings of their individual components. Thus, an awareness of morphological structure can help children to learn new vocabulary, understand words they read, and aid in pronunciation when decoding (Apel & Swank, 1999; Carlisle, 1995, 2000; Nagy et al., 2006; Nunes, Bryant, & Olsson, 2003). Morphological awareness may be a skill independent of phonemic awareness, an established known predictor of literacy, and may contribute unique variance to children's early literacy development (Apel, Masterson, & Niesson, 2004; Carlisle & Nomanbhoy, 1993; Deacon & Kirby, 2004; Kirk & Gillon, 2009). In

fact, Carlisle and Nomanbhoy (1993) reported that morphological awareness accounted for a significant 4% of the variance in single word reading, above and beyond the contribution of phonological awareness for first grade children. Similarly, Wolter et al. (2009) found morphological awareness contributed uniquely in first grade children; specifically, morphological awareness accounted for 9.6% significant and unique variance on single-word reading above and beyond that accounted for by phonological awareness. In addition, research conducted by Singson and colleagues revealed that not only is morphological awareness a unique predictor of reading success, but that phonological awareness tapers off as a successful predictor of literacy by third grade, and morphological awareness increases in its capability to successfully predict reading performance (Singson et al., 2000).

Morphological awareness also has been found to be related to reading comprehension (Jarmulowicz et al., 2008; Larsen & Nippold, 2007; Mahony et al., 2000; Masterson & Apel, 2007). For decades researchers have noticed that many students succeed in learning to read and comprehend simple texts in the early grades, but struggle to comprehend grade-level texts in the upper elementary years where vocabulary is more morphologically complex. While there are likely many causes for what has been dubbed the "fourth-grade slump" (Kieffer et al., 2007 p. 135) a significant relationship has been found between morphological awareness and reading comprehension in the fourth and fifth grade (Kieffer & Lesaux, 2007). Carlisle (2000) found morphological awareness to significantly contribute to reading comprehension in both the third and fifth grades, although the relationship was particularly strong for fifth graders. It is important and educationally significant that morphological awareness was significant for third graders who are presumably still learning basic strategies for recognizing morphologically

complex words. The results of this study support the idea that morphological awareness is a significant predictor of reading comprehension even in the early elementary school grades.

In addition, morphological awareness has been found to be a unique predictor of spelling achievement (Ehri, 2000; Nunes, Bryant, &Bindman, 2006; Nunes et al., 2003; Wolter et al., 2009). Deacon, Kirby, & Casselman-Bell (2009) discovered that morphological awareness measured in Grade 2 accounted for approximately 8% of the spelling variance in Grade 4. This finding is significant and impressive since a large number of other variables were controlled (e.g., phonological awareness, orthographic knowledge, verbal and nonverbal intelligence, verbal short term memory). Moreover, Wolter et al. (2009) found that morphological awareness accounted for 7.4% significant and unique variance on spelling tasks above and beyond that of phonological awareness in first-grade children.

The aforementioned studies all have one thing in common; namely they use static assessment tasks to evaluate their outcomes. A common static assessment to administer is a sentence completion task. In Carlisle (2000) derivational and decomposition sentence completion tasks were used. An example of a derivational task would be to give the child a base word (e.g., *warm*) and ask him/her to complete a sentence using the appropriate derivative ("He chose the jacket for its____"; expected response, *warmth*). A decomposition task might include giving the child a derived word (e.g. *baker*) and asking the child to complete a sentence using the base word ("She put the bread in to _____"; expected response *bake*). The benefit to using a sentence completion task is that it is something young children are capable of completing and the child is forced to independently produce morphological knowledge. The downfall is that since the task requires completing a sentence it may access some intuitive knowledge rather than knowledge of morphological awareness. The child's focus is directed towards manipulating

meaning of individual words, however, so some explicit knowledge of morphological awareness likely plays a role in correct responses (Carlisle, 1995).

Recently, a new tool has been developed to assess morphological awareness, namely a dynamic assessment of morphological awareness. This dynamic assessment of morphological awareness was introduced in a study by Larsen and Nippold (2007), and was based on Vygotsky's (1978) theory *zone of proximal development* (ZPD). The theory purports that when children work independently performance may be limited; however, if an adult provides *scaffolding* in the form of questions and various cues, the child may increase performance and thus the potential for growth may be harnessed. Larson and Nippold (2007) developed a progressive series of scaffolds or prompts in a dynamic task of morphological awareness for 6th grade children. These scaffolds ranged from providing verbal prompts, which focused the child's attention towards smaller parts, to offering multiple-choice questions. Performance on the dynamic assessment task revealed a wide range of skill levels in the sixth-grade children studied and was positively related to the children's literacy levels. Thus, implementation of a dynamic assessment may result in a more sensitive test of morphological awareness knowledge and provide greater information to clinicians when writing treatment goals (Larsen & Nippold, 2007).

Morphological Awareness Instruction

Given the importance of morphological awareness related to literacy success, it would appear that instruction in this area may be valuable. Limited research, however, exists in which morphological awareness instruction approaches have been investigated. The research found, however, has produced promising results for elementary school-age children.

Three studies were completed at the level of whole-class instruction. Baumann et al. (2003) performed a study which explored the impact of teaching typically developing fifth-grade students how to derive word meanings through morphological and contextual analysis (using sentence cues to determine word meaning). A textbook vocabulary learning program where children were explicitly taught vocabulary words was compared to a morphological awareness-plus-context treatment condition where children were taught strategies for learning unknown words. The morphology-plus-context treatment condition included lessons where morphological and contextual analysis strategies were taught using examples from the textbook. For example, for the morphological strategies, students might be introduced to a specific prefix family using a keyword such as *disagreement*. Then students would be asked to analyze other words in the "family" and pick out any exceptions that did not meet the requirements of the morphological rule or family they had been taught. In addition, in the contextual analysis instruction, children were taught to use sentence context to infer word meanings. Results indicated that the participants who received textbook vocabulary learning programs received higher scores than the morphological awareness-plus-context group on a test of textbook vocabulary. The morphological awareness-plus-context group, however, was better able to use word parts to derive meaning from untaught vocabulary. Both treatment groups performed at the same level on tests of general comprehension of the social studies text. These results suggest that morphological awareness treatment teaches more generalizable skills than a standard textbook vocabulary program. This idea was further confirmed by teachers and students who reported using the morphological awareness strategies on a variety of literacy tasks in multiple subjects (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003).

Baumann et al. (2002) also studied typically developing students in the fifth-grade. This study randomly assigned four fifth-grade classes to either a morphological awareness only, context-only, a combined morphological awareness and context experimental group, or a control group. Instruction was delivered in twelve 50-minute lessons during which the morphological awareness only classroom focused on eight frequently occurring prefix-families (e.g., *un-, pre-, anti-)*. The context-only group focused on using information in surrounding sentences to guess the meaning of unknown vocabulary. Students who received morphological awareness instruction were significantly better able to derive meaning from morphologically complex untaught words. No significant differences were noted between groups that received morphological awareness instruction in isolation or in combination with context instruction, suggesting that these skills can successfully be taught together (Baumann et al., 2002).

Finally, Wysocki and Jenkins (1987) conducted an experiment in which typically developing fourth-, sixth-, and eighth-grade students received three 15-20 minute lessons. These lessons included instruction in the definition of low-frequency words in isolation and sentence contexts. This was accomplished by writing vocabulary words and their definitions on the board and requiring students to read these words and definitions a number of times aloud as a class. When the class was familiar with the words, the instructor erased the definitions. To assess their knowledge, the class was asked to either produce the definition of a given word or produce the word when given the definition. The class was later tested on untaught vocabulary words that were morphological derivatives of the original vocabulary words (e.g., *gratuitous* for *gratuity*) to assess whether morphological generalizations occurred. At all grade levels, morphological generalizations occurred and the new knowledge of morphological awareness was used to define unfamiliar words (Wysocki & Jenkins, 1987).

While the previous three studies focused on whole group instruction, Kirk & Gillon (2009) combined individual and small group instruction in their study of sixteen students between the ages of 8 and 11. Children were assigned to either an experimental group that received intervention immediately or to a control group who did not receive instruction until after the experimental group had finished the intervention program. These students were chosen by their teachers because they were considered to be poor spellers of normal intelligence. Each participant received between 16 and 22 intervention sessions of approximately 45 minutes each. Each week included both an individual session and group session with four other students. Intervention focused on promoting simultaneous attention to multiple-linguistic factors (i.e. morphological awareness, phonology, and syntax). Intervention tasks included sorting, reading, and spelling morphologically simple and morphologically complex words to promote the discovery of patterns across words. Results showed that participants who received morphological awareness instruction performed significantly better on decoding and spelling outcomes than those in the control group. Morphological strategies were generalized to untaught words as evidenced by improved spelling accuracy and reading scores, and were maintained for 6 months after intervention.

In the study by Nunes (2003) typically developing seven-and eight-year-old children were randomly assigned to 1of 5 groups: morphological training alone, morphological training with writing, phonological training alone, phonological training with writing, or a control group. Small groups of 4 to 8 children were taught in 12 weekly intervention sessions that lasted approximately 30 minutes. The main focus of these groups was promoting explicit understanding of either morphological or phonological rules. Activities included word classification, segmenting, blending, and analogy games. The morphological groups were taught about word

stems, inflectional affixes (e.g., the past tense-*ed* verb ending) and derivational affixes (e.g., agentive endings like *–er* in writer), and phonological groups classified words based on phonological similarities (e.g., long and short vowels). The researchers found that all the students in the first four groups outperformed the control group on reading measures. Students who received morphological awareness training (with or without the written component) made significant gains in spelling, and smaller but still significant gains in reading. The phonological awareness group made significant gains in reading, but not in spelling (Nunes et al., 2003).

Vadasy and colleagues (2006) presented two studies on the effectiveness of individual instruction in morphological awareness compared to oral reading practice on second- and third-grade students with below-average reading levels. In Study 1, participants from 12 schools were recruited, 6 schools became treatment sites and 6 became control sites. Study 2 consisted of 28 second- and third-grade classrooms from five schools. Intervention in both studies consisted of 30 minutes of individual tutoring, 4 days a week for 20 weeks. Activities focused on 15 minutes of instruction in word-level skills and morphological awareness instruction and 15 minutes of oral reading practice. A set of 30 lessons were created to introduce and review reading and spelling words with common affixes (e.g*. dis-, pro-, -ly*). Other lessons were scripted to cover allomorphs in plural words (-*s* pronounced as /s/, /z/, /ez/), and multisyllabic words with common prefixes (*dis-, mis-, pro-)*. Visual and verbal scaffolds such as letter-sound picture cards were used as supports. In study 2, the first 12 lessons were designed to review reading and spelling words that included two-letter combinations. The second set of 34 lessons included reading and spelling multisyllabic words and the third set of 20 lessons covered inflected words. Finally, 3 to 4 minutes of each session was devoted to reading and spelling high-frequency words that did not follow commonly used rules. In both studies researchers found that students who

received morphological awareness instruction significantly outperformed control students in fluency, spelling, comprehension, reading efficiency, and decoding accuracy (Vadasy, Sanders, & Peyton, 2006).

Summary

In summary, the research has established a significant relationship between morphological awareness and the literacy skills of sight word reading, decoding, reading comprehension, and spelling. These studies, however, have included various modes of morphological awareness assessment and thus results may be conflicting.   Larsen and Nippold (2007) found that dynamic assessment revealed a wide-range of skill levels related to literacy achievement in sixth grade children; however, its success in younger grades is still untested. Furthermore, studies of morphological awareness intervention have shown significant gains in reading and spelling after focused instruction on teaching base words, affixes and their meanings. The majority of this research, however, has been conducted in the upper elementary school years.

Following the lead of Larsen and Nippold (2007), dynamic assessment may be a valuable way to sensitively assess morphological awareness and provide treatment insights for school-age children. Thus, the purpose of this research was to determine whether a) a dynamic assessment task of morphological awareness is a sensitive instrument and reveals a range of performance levels in third-grade children, and b) performance on a dynamic assessment task of morphological awareness may be significantly improved with dynamic scaffolding.

Methods

Participants

The participants for this study included twenty-three third-grade children attending an elementary school in the Intermountain West with a mean age of 8;5 (range 8;0 to 9;0). Testing was administered during the spring semester of their third grade year. The sample was 54.1% female and 45.9% male. Parents and teachers reported no concerns regarding speech and language development. Normal hearing acuity was determined through school records. All the students passed a hearing screening within a year of the testing. Cognitive ability was also within normal limits for all participants.

Measures

Static morphological awareness task. The static morphological awareness task was an oral morphological production task described by Carlisle and her colleagues (Carlisle 1995; Carlisle & Nomanbhoy, 1993; Carlisle & Flemming, 2003) and adapted by Wolter et al. (2009). This task required children to produce the correct morphologically complex form of a word to complete a sentence. For example, the examiner would read aloud a base word such as *farm* and then read the sentence context, such as "My uncle is a _____." The child was asked to provide a form of the base word that fit the sentence (the expected response in the example item would be *farmer*). The assessment consisted of fifteen test items; five of which were *inflected* forms (e.g., plurals, past tense, comparatives), five of which were *derived transparent* forms in which the relationship between the base word and derived word was clear or transparent (no phonological or orthographic changes to the base word) (e.g., *teach* and *teacher*), and five of which were *derived opaque* forms in which the relationship between the base word and derived word was less clear or opaque (involved either phonological and orthographic changes to the base word)

(e.g., *long* and *length*). One practice item was administered to ensure that the children understood the task.

Scoring and reliability. Full credit was assigned if the targeted word and/or a plausible derivation, a derivation which fit semantically and syntactically in the target sentence, was provided. Interscorer reliability for the morphological production task was conducted and one hundred percent of the protocols were scored independently by two separate scorers who were blinded to the purpose of the study. Following the independent scoring, the assigned scores were compared, and the calculated interscorer agreement was 99.5%. Discrepancies were resolved through consensus.

Adapted morphological awareness dynamic assessment task. The morphological awareness dynamic assessment task, developed by Larsen and Nippold (2007), was adapted for the present study. In the morphological awareness dynamic assessment task, student's were asked to define 15 derived morphologically complex words. If the child was able to define the word, questions were asked to determine whether knowledge of the words meaning was based on morphological cues. If the child was unable to define the word, scaffolds were presented until a correct answer is given or the scaffolds are completed. The present study designed its task following the four-stage method laid out by Larsen and Nippold (2007) which included a) selecting derived morphologically complex stimulus words, b) creating assessment scaffolds, c) writing a script for assessment administrators, and d) generating a system for scoring.

Stimuli development. The purpose of the morphological awareness dynamic assessment task was to ascertain whether children could use their knowledge of familiar base words and suffixes to determine the meaning of uncommon complex words. Words were selected to ensure the participants had to use their morphological knowledge to assist them in the task, specifically

utilizing their derivational knowledge. This was done by including familiar or high frequency base words which became rare or low frequency derived words. For example, *yellow* is a high frequency word but when the suffix *–ing* is added, *yellowing* becomes a low frequency word.

Larsen and Nippold's task had been originally designed for 6th grade children and thus, some of the task stimuli were changed to include words, definitions, and sentences appropriate for third-grade children. Stimulus items included 16 word pairs that were transparent (no change in sound or spelling between derivatives. Each base word was high frequency with low frequency derivatives. *The Educator's Word Frequency Guide* (Zeno, Ivens, Millard, &Duvvuri, 1995), a resource containing words rated for frequency of occurrence in written language according to grade levels, was used to ensure that stimulus words contained high-frequency base words and low frequency affixes. For the word selection in the current study, we included a criterion value of 50 or greater to indicate high frequency base words in third-grade literature and 40 or less for low-frequency derivatives. Through this process, approximately 50% of the words included in this task were retained from the original Larsen and Nippold study and 50% were developed by the authors of this paper. The average base word frequency was 58.12 (range: 50.80-63.10, *SD*= 3.72) and the average derivative frequency was 30.17 (range: 13.20-36.70, *SD* = 6.68) (see Appendix A for words).

Task procedures. The 16 stimulus items were presented to the children in one-on-one testing sessions. In the testing sessions, children were asked to define each targeted word (e.g. define the word *wishful*). If needed, a series of prompts or scaffolds, consistent with Larsen and Nippold's (2007) task, were then systematically provided to determine the required level of assistance needed and to determine the level of the child's morphological awareness. The scaffolds in the present study were designed to show differing levels of morphological awareness

and were increasingly more helpful for defining the stimulus words. After a scaffold was provided, the administrator was instructed to pause for 10 seconds in order to give the child adequate time to respond. If no response was given or the answer was incorrect, the administrator moved on to the next prompt. The scripted procedure used was adapted from Larsen and Nippold (2007).

   Scoring and reliability. One first year speech language pathology graduate student and one undergraduate student (a post-baccalaureate student in her senior year) were carefully trained by the Chair of this project in scoring procedures for the dynamic assessment measure. One training session was provided which lasted approximately two hours. The scorers were blind to the purpose of the study. Each scorer was provided with a copy of the scoring methods taken from Larson and Nippold (2007). The trainer modeled scoring procedures using a randomly selected completed participant protocol. The first few words were completed together and then the following words were done individually and then discussed as a group. Any differences in scoring were agreed upon before moving onto the next item. Following the training session, each scorer graded all of the tests independently of each other, thus all tests were scored twice. Scoring was based on the research by Larsen and Nippold (2007). Scores were awarded on a 0-5 point scale. Points were subtracted as more prompting was required, with 5 points being awarded if the child correctly defined the word and identified the two morphemes to 1 point awarded if the correct definition was selected from a multiple choice prompt; and 0 points awarded if the appropriate definition was not given after all prompts were exhausted. Following the independent scoring, the assigned scores were compared, and the calculated interscorer agreement was 85%. Discrepancies were then resolved through consensus.

Test administration. Testing was completed in the spring of the 2009 academic year (April, May). Each child completed the static morphological awareness task as part of a series of literacy-related measures from part of a larger study (see Wolter & Barger, in preparation). Each child was tested individually. Mean testing time for the initial testing of morphological awareness measures (static morphological awareness assessment and time one morphological awareness dynamic assessment) with each child was approximately 30 minutes and was completed in one sitting. The second administration of the morphological awareness dynamic assessment task was completed within 2-3 days of the initial time one administration of the morphological awareness dynamic assessment task.

Results

The results of the children's performance on the static morphological awareness measure, and the morphological awareness dynamic assessment task are displayed in Table 1. A subsequent percentage of change and t-test was computed for the dynamic assessment morphological awareness task. Results are displayed in Tables 2 and 3.

In order to determine whether the morphological awareness dynamic assessment task revealed a range of performance, we compared the means and standard deviations of the adapted morphological awareness dynamic assessment task (Trial 1 and 2 of the dynamic assessment morphological awareness task and the static raw score of morphological awareness.) The standard deviation of both trials of the morphological awareness dynamic assessment task (SD=10.12, 11.25 respectively) were much higher than the standard deviation of the static morphological awareness task (SD=1.83). These results, found in Table 1, may indicate an increased sensitivity to the range of performance levels seen in third-grade children.

In order to test our prediction that children's performance would improve between Trial 1 and Trial 2 on the dynamic morphological awareness task, we compared the total mean score of Trial 1(M=30.00) to that of the Trial 2 (M=38.65) using a within subjects paired sample t test. The improvement of mean scores on the morphological awareness dynamic assessment task between Trial 1 and 2 were large enough to be statistically significant (t=-5.35,df=22, p<.01) (see Table 3). Furthermore, descriptive data revealed that 87% of participants demonstrated a positive change in performance on the morphological awareness dynamic assessment task over time (see Table 2).

Table 1

Participants' Performance on a Morphological Awareness Dynamic Assessment Task
(N=23)

Task	M	SD
Morphological Awareness Dynamic Assessment Task Trial 1	30.00	10.12
Morphological Awareness Dynamic Assessment Task Trial 2	38.65	11.25
Morphological Awareness raw score	13.39	1.83

Table 2

Participants' Improvement on a Morphological Awareness Dynamic Assessment Task
(N=23)

Task	Frequency	Percent
No Change	1	4.3
Positive Change	20	87.0
Negative Change	2	8.7

Table 3

Paired Samples' *t* Test

	(N=23)		
Pairs	t	df	Sig. (2-tailed)
Morphological Awareness Dynamic Assessment task 1 and Morphological awareness Dynamic Assessment task 2	-5.35	22	0.00

Discussion

As you may recall, the aims of this study included a determination of whether a) a morphological awareness dynamic assessment task is a sensitive instrument and reveals a range of performance levels in third-grade children, and b) performance on a morphological awareness dynamic assessment task may be significantly improved with dynamic scaffolding. In the following sections we discuss our findings for each question.

Morphological Awareness Dynamic Assessment Task Performance Range

The results indicated that the morphological awareness dynamic assessment task did portray a wide range of performance among participants. This is consistent with results found among sixth grade children by Larsen & Nippold (2007) who found a similar occurrence of large standard deviations among scores on their dynamic task. Taken together, this preliminary evidence suggests that a dynamic morphological awareness task may be a valuable way to sensitively assess morphological awareness in not only upper elementary grades but also third grade.

Larsen & Nippold (2007) studied the performance variability on a morphological awareness dynamic assessment task compared to variability on literacy tasks. This was accomplished by comparing the standard deviations for each task. Since all of the standard deviations were high (ranging from7.99 to 9.84) the authors concluded that performance on the

morphological awareness dynamic assessment task revealed a wide-range of abilities and thus may be related to other aspects of literacy. In our study we found a notable difference between the large standard deviation on the dynamic assessment of morphological awareness tasks (*SD* =10.12, 11.25) versus the smaller standard deviation on the static morphological awareness task (*SD*=1.83). The results indicated that the morphological awareness dynamic assessment task yields a wider range of performance which may result in more sensitivity to the varying morphological awareness abilities of children in third grade. If replicated with a larger sample, a task such as this, which reveals a greater range in performance, may ultimately help to better determine child deficits in morphological awareness which could be related to literacy abilities.

The results obtained in this study have clinical implications because, if our results are accurate, a dynamic assessment would allow clinicians to better understand where a child's deficit lies by giving us a more sensitive range of performance. Traditionally, static assessments have been used to test children; however, these assessments provide only a glimpse of what children really know. Static assessments may only test sensitivity to morphological awareness which is an earlier developing skill. Conversely, a dynamic assessment may test more advanced meta-skills which requires children to actively reflect and explicitly explain morphological awareness. Thus; dynamic assessment may be testing a more advanced skill where there is a greater range of performance at the third-grade level. This greater variability coupled with the systematic scaffolding may allow clinicians to determine a deficit more accurately. That is, by giving us a more sensitive range of performance; a dynamic assessment may also be able to differentiate children who have deficits in literacy.

Morphological Awareness Dynamic Assessment Task Performance Improvement

The purpose of the second question was to determine whether performance on a morphological awareness dynamic assessment task may be improved with dynamic scaffolding. Results indicated that participants did significantly improve their performance on a dynamic morphological task through the use of systematic scaffolding. This is a unique contribution to the literature because it examines improvement in morphological awareness performance via dynamic assessment, a subject that has not yet been investigated in previous research.

In this study, students significantly improved their morphological awareness performance after being provided with scaffolds. These scaffolds ranged from providing verbal prompts, which focused the child's attention towards smaller parts of words, to offering multiple-choice questions. It appeared that children did improve performance following this instruction. That is, at no time were children told the correct answer, instead they were only provided with scaffolding prompts. Yet there was significant improvement in the children's ability to demonstrate morphological knowledge on low-frequency derivatives, thus indicating that scaffolding prompts likely resulted in instructional improvement. It should be noted that this study did not determine which scaffolds were the most effective in increasing performance, which may be valuable in future research.

Given that morphological awareness is an important aspect of literacy development as evidenced by research, it is important that those children with deficits in morphological awareness be identified and aided with appropriate instruction (Baumann et al., 2003; Baumann et al., 2002; Carlisle, 2000; Mahony et al., 2000; Nagy et al., 2006; Wolter et al., 2009; Wysocki & Jenkins, 1987). Our findings suggest that the morphological awareness dynamic assessment task may be a sensitive tool for both identifying children with deficits and helping them to

improve their morphological analysis abilities. Due to the statistical significance of our data and the high percentage of students who improved their morphological awareness dynamic assessment task scores over time, it seems likely that performance on a dynamic assessment of morphological awareness can be improved with dynamic scaffolding.

Limitations and Future Research

In this study, only typically developing third-grade students in one elementary school were examined. Thus, this limitation prevents the generalization of our results to students of other grades and ability levels. Furthermore, the second trial of the morphological awareness dynamic assessment task was delayed by only three days. As a result students may have performed better due to greater familiarity with the test or memorization of correct responses rather than increased morphological awareness skills. Although test familiarity may have been a factor, it should again be noted that test administrators never provided students the correct definition of any of the stimulus words. Thus, students were required to make some inference of word meaning which indicates that scaffolding may have contributed at some level to help them to make that inference. Furthermore, in order to receive credit for a correct response student's were required to talk about the morphological parts in the stimulus words leading the author to believe that some morphological awareness learning still took place. Future research may delay retesting one to three months post initial testing and/or change stimulus items to untaught words in order to reduce any familiarity or memorization of stimulus items and measure learning maintenance. Changing stimulus items may also help determine if morphological awareness skills taught in the morphological awareness dynamic assessment task generalize to untaught words and are used on a long term basis.

In the current study, we did not include a research component to determine which scaffolds were most effective in improving performance. This might be an important future research endeavor because knowing the most effective scaffolds could prove to be efficacious, thus preventing the waste of clinical time on ineffective treatments. Moreover, the elimination of potentially ineffective scaffolds may reduce test fatigue and streamline the dynamic assessment. Furthermore, as more is known about specific scaffolds which improve performance, researchers may be better informed as to which skills should be targeted in evidence-based practice treatment studies.

An additional component to be reflected on in this study was the inclusion of only oral measures in the morphological awareness dynamic assessment task. In order to compare performance on a static test of morphological awareness and the morphological awareness dynamic assessment task, delivery of stimuli needed to be consistent and thus completely oral. Future research might add a written component to the dynamic assessment task in order to determine whether the orthographic scaffold of seeing a base word within a derived word may further aid in the learning process.

Summary

Researchers have begun to establish a significant relationship between morphological awareness and the literacy skills of sight word reading, decoding, reading comprehension, and spelling (Carlisle, 1995, 2000; Carlisle & Nomanbhoy, 1993; Jarmulowicz et al., 2008; Kirk & Gillon, 2009; Mahony et al., 2000; Singson et al., 2000; Wolter et al., 2009). Larsen and Nippold (2007) revealed that dynamic assessment may be a valuable way to sensitively assess morphological awareness and provide treatment insights for school age children. The findings of the current study extend the findings of Larsen and Nippold to third-grade children and indicate

that dynamic morphological assessment may be used as a sensitive test to discriminate

performance and provide treatment insights for elementary school children. Moreover, scaffolds

included in a dynamic assessment may prove to be a valuable way to not only increase

morphological awareness performance, but also to provide insights as to the level to start

implementing morphological awareness instruction. With further research, a morphological

awareness dynamic assessment task may prove an important assessment and instructional tool.

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Appendix A

Stimuli for Dynamic Assessment for Morphological Awareness

Cookery (n.): the art or practice of cooking; a place or area for cooking

Derived word frequency: 31.9

Root word frequency (cook): 55.8

Grandma's cookery was awful so Bob did not like eating at her house.

Choices: the art of decorating; the art of preparing food; the art of sewing

Equalize (v.): to equal; match

Derived word frequency: 34.8

Root word frequency (equal): 59.0

At the track meet, Josh ran extra fast so he could equalize his time with his opponent's.

Choices: to increase; to match; to decrease

Oddity (n.): the quality or character of being odd or peculiar; peculiarity; strangeness;singularity

Derived word frequency: 33.9

Root word frequency (odd): 55.3

The singing horse with a purple tail was an oddity at the fair.

Choices: a common thing; an unusual thing; a pretty thing

Odorous (adj.): emitting a smell or scent; scented, smelly

Derived word frequency: 34.6

Root word frequency (odor): 50.8

Mary did not like cleaning the litter box out because it was so odorous.

Choices: large; boring; strong smelling

Puzzlement (n.): the fact or condition of being puzzled; perplexity; bewilderment; confusion

Derived word frequency: 31.8

Root word frequency (puzzle): 52.2

Kim tried to figure out how to put the bike together and finally gave up in puzzlement.

Choices: confusion; happiness; fright

Secretive (adj.): inclined to or fond of secrecy; very reticent; indicative of secrecy

Derived word frequency: 30.5

Root word frequency (secret): 56.7

Tim had to be very secretive so Gail wouldn't find out about the surprise party.

Choices: silly; mysterious; angry

Wishful (adj.): having or showing a wish; desirous; longing

Derived word frequency: 33.1

Root word frequency (wish): 60.6

Susan's wishful thinking resulted in her asking for a new bike.

Choices: to want something; to build something; to eat something

Oceanaut (n.): a scuba diver trained to work in underwater installations and conduct, assist in, or be a subject of scientific research.

Derived word frequency: 22.1

Root word frequency: 61.6

The oceanaut was interested in knowing more about fish habitats.

Choices: underwater scientist; underwater creature; underwater plant

Yellowing (n.): the act or process of making yellow.

Derived word frequency: 36.7

Root word frequency (yellow): 60.2

Mary's wedding dress was yellowing and so she took it out of the attic.

Choices: to become old; to become out of style; to become lost

Coverlet (n.): a bed quilt that does not cover the pillow, used chiefly for warmth; bedspread.

Derived word frequency: 35.5

Root word frequency (cover): 59.6

Sue had a beautiful coverlet on her bed.

Choices: a blanket; a candlestick; a picture

Craziness (n.): senseless; impractical; totally unsound

Derived word frequency: 31.6

Root word frequency (crazy): 53.3

John was kept after school because of his craziness.

Choices: to be abnormal; to be calm; to be sad

Payee (n.): a person to whom money is paid

Derived word frequency: 36.4

Root word frequency (pay): 62.2

The bank gave the money to the payee.

Choices: one who is given money, one who is given freedom, one who is given employment.

Touchily (adv.): apt to take offense on slight provocation; irritable

Derived word frequency: 22.1

Root word frequency (touch): 59

Dan responded to the correction in a touchily way.

Choices: ready to take offense; ready to laugh; ready to eat

Gaming (n.): the playing of games, esp. those developed to teach something or to help solve a problem.

Derived word frequency: 32.4

Root word frequency (game): 61.5

Jake liked gaming, and often invited his friends over to play.

Choices: to play; to sleep; to swim

Guesser (n.): one who commits oneself to an opinion about (something) without having sufficient evidence to support the opinion fully

Derived word frequency: 22.1

Root word frequency (guess) 59

Jane is an excellent guesser because she told exactly the number jellybeans which were in the jar.

Choices: someone who thinks something; someone who dreams something; someone who eats something

Ageist (n.): discrimination against persons of a certain age group.

Derived word frequency: 13.2

Root word frequency (age): 63.1

The ageist company refused to give the old man a job.

Choices: one who discriminates; one who yells at; one who jokes with

LEVELS PROMPTS FOR

DYNAMIC MORPHOLOGICAL AWARENESS ASSESSMENT

Prompt #1:

"Tell me what the word _____ *means*."

_____

  A. The child answers *correctly,* the examiner goes to Prompt #2.
  B. If the child does not respond or answers *incorrectly,*
  the examiner goes to Prompt #3.

Prompt #2:

"How did you know that?"

_____

  A. The child's explanation refers to the individual morphemes,

  the examiner goes to the next word.

  B. If the child's explanation does *not* refer to the individual

  morphemes, the examiner goes to Prompt #3.

Prompt #3:

"Does the word _____ have any smaller parts?" (YES   / NO)

"What are those parts?" _____ _____

  A. If the child answers *correctly,*
   the examiner asks, **"Now can you tell me what the word means?"**

   _____

  B. If the child does not respond or answers *incorrectly,* the

  examiner goes to Prompt #4.

Prompt #4:

"The smaller parts in this word are _____ and_____.

Now can you tell me what the word means?" _____

      A. If the child answers *correctly,* the examiner goes to the next word.

      B. If the child does not respond or answers *incorrectly,* the

examiner goes to Prompt #5.

Prompt #5:

"Listen to this sentence and then tell me what _____means:

      A. If the child answers *correctly,* the examiner goes to the next word.

      B. If the child does not respond or answers *incorrectly,* the

examiner goes to Prompt #6.

Prompt #6:

"Which of these choices gives the meaning of the word _____*?*

(examiner presents three choices):

Author's Biography

Katherine Pike was raised in North Ogden, Utah where she graduated from Weber High school in 2008. She entered Utah State University in the fall of the same year and declared a major in Communicative Disorders with an emphasis in Speech-Language Pathology. She immediately became active in the Honors and Undergraduate Research Fellow programs. She was also pleased to be accepted into the National Society of Collegiate Scholars and National Student Speech-Language Hearing Association. While in the Communicative Disorders program she was able to travel to Cuenca, Ecuador on a humanitarian mission and learn about assistive technology in a special needs orphanage. After graduation in May 2011 she plans to enter graduate school to earn her Master's Degree in Speech-Language Pathology.