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METALINGUISTICS AND READING
IMPLICATIONS FOR FUTURE ASSESSMENT AND MANAGEMENT

BY

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B.S., Rhode Island College, 1980

THESIS

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INTRODUCTION

The primary purpose of communication is to transfer meaning from one person to another. Communication is one of the ingredients that provide an outlet for expressing ideas, acquiring knowledge and building values and feelings. In general, communication can create harmony or discord, account for change and hopefully improve the quality of life. According to Nicolasi, Harryman, & Krescheck (1983), communication is "a process by which meanings are exchanged between individuals through a system of symbols" (p. 56). Language is one mode of communication and metalinguistics is the ability to think about language (van Kleeck, 1982). Another mode of communication is reading, which is intricately related to language and thus to metalinguistics (Amoriell, 1979; Athey, 1983; Carrow-Woolfolk & Lynch, 1982; van Kleeck & Schuele, 1987). The following study concerns metalinguistics as it relates to differentiating reading disorders and language disorders since the base of reading ability stems from language ability.

Review of the Literature

Language and Metalinguistics

Individuals have succeeded in creating a variety of systems with which to communicate. One important system is

oral language, which develops in a relatively sequential manner (Owens, 1984). It also begins during the early stages of infancy and may continue to develop throughout life. Anne van Kleeck (1982) describes the development of language in terms of two related achievements. The first is the development of primary linguistic skills and the second is the development of metalinguistics. The development of primary skills lead to the comprehension and production of language and are composed of the elements of phonology, syntax, semantics and pragmatics. Thus, language consists of an integration of sounds, rules, meaning and form. In terms of language learning, all four components are required to create the most successful communication, and individual differences occur in relation to the acquisition of each component.

The second achievement in the development of language, metalinguistics, is described by van Kleeck (1982) as "the ability to reflect consciously upon the nature and properties of language" (p. 237). This ability comes under the rubric of metalinguistics or language awareness. According to van Kleeck (cited in Wallach and Butler, 1984), language is something that happens on an unconscious level while metalinguistics is a more complex task focusing on how and why language works. As a result, metalinguistics and language form an integration between the "how and why" of oral communication. In general, metalinguistic awareness

requires the combined variables of linguistic skill, adequate intelligence, and cognitive capabilities. It is also suggested that creativity and appropriate environmental experience are integral components (van Kleeck, cited in Wallach and Butler, 1984).

Flood & Salus (1982) state that metalinguistic ability brings the knowledge of language to conscious awareness and involves the awareness of the language of self and others. The acquisition of metalinguistic awareness is a continuous process, as is the acquisition of language (Cazden, cited in Waterhouse, Fisher, & Ryan, 1980). Research has shown that children are competent in the use of a particular language skill before they can reflect on it in the metalinguistic sense (Flood & Salus, 1982; Scholl & Ryan, 1980; Liles, Shulman, & Bartlett, 1977; Kamhi & Koenig, 1985; Bialystok, 1985; Papandropoulou & Sinclair, 1974). These same metalinguistic abilities also change in their degree of complexity as the child and his language abilities change (Flood & Salus, 1982).

In addition to the competence, in other words conceptualization of language skills, another component in metalinguistic awareness is the cognitive component. Cazden (1976, cited in van Kleeck, 1982) states that "metalinguistics is a special kind of performance, one which makes special cognitive demands" (p. 603). As language skills become more automated, there are more cognitive

resources available to children to consciously analyze the forms of meaning (Hakes, 1982, cited in Bohannon, Warren-Leubecker, & Hepler, 1984). Anne van Kleeck (1982) views metalinguistics as "a vehicle for the transmission of thought" which includes cognition (p. 239).

Most researchers to date have utilized the general term of metalinguistics or linguistic awareness. Recently, some authors have begun to segment this broad category into the same components as the language components (i.e., phonology, syntax, semantics and pragmatics). Within the context of language, it is possible to think consciously about the sounds, rules, meanings and form of language. Numerous authors make reference to metapragmatics, metacognition and metacommunication, although the terms metasyntax, metaphonology and metasemantics have not been adopted. When language disorders are discussed, they are often categorized in terms of the components of language (Wiig & Semel, 1984). In order to define a child's specific metalinguistic abilities, more discrete categories are required. This becomes evident when individual metalinguistic tasks are analyzed.

Kamhi (1987) defines six metalinguistic tasks:

1. repairing communicative breakdowns.
2. making listener adjustments.
3. making judgments of language content and form.
4. analyzing language into linguistic units.

5. understanding and producing rhymes, riddles and puns.
6. understanding and producing figurative language (p. 3).

Each of these categories involves the ability to reflect on one or a combination of the following: phonology, syntax, semantics and/or pragmatics. Knowing a child's overall metalinguistic ability is not enough. More useful information can be obtained when the patterns of abilities can be segmented in terms of more distinct components.

In summary, metalinguistic skills develop as a result of knowledge about language. These skills are dependent on the competence and performance of language, and both language acquisition and metalinguistics develop over a period of time. In order to obtain useful information about a child's specific metalinguistic abilities, tasks must be designed to correlate with the components of language.

Reading

A second system with which to communicate is through graphic representation, and one component of this category is reading. Carrow-Woolfolk & Lynch (1982) consider reading one aspect of language. Athey (1983) defines reading as "an activity that involves extracting meaning from print and assimilating that meaning to one's existing store of information" (p. 197). Built into this definition is the

idea that reading involves more than just identification of letters or decoding, but that it also requires thinking.

In order to read, Athey (1983) also postulates three requirements:

1. experiences.
2. a large conceptual network.
3. the language facility to express ideas.

In terms of experience, the student can only extract from the information presented as much as his background can provide. Kawakami & Hu-pei Au (1986) state, "What the reader brings to the text seems to be as important in the process of constructing meaning as the wording of the text itself" (p. 74). In terms of a conceptual network, vocabulary development within context rather than in isolation is critical (Athey, 1983). The third component of this definition of reading forms a link between reading acquisition, oral language and the importance of the speech language pathologist in the area of reading.

In the past, reading has been considered a visually based task (van Kleeck & Schuele, 1987). Recently, emphasis has shifted to a combined visual/language based model. When a child attempts to pronounce a word that he is unable to recognize through context, he must combine the visual-spatial skills of grapheme recognition with the auditory-temporal skills of phoneme recognition to attain a correct production (Amoriell, 1979). Reading involves more,

though, than the production of words; it involves integrating meaning, which is why reading is so closely linked to oral language.

Language contains a rule based component, syntax, and a meaning based component, semantics. These are important factors as well in the development of reading (Athey, 1983). Phonology is also important to reading and falls under the category of decoding. All three of these components are necessary prerequisites to reading. The transition to reading is dependent on the skills learned during oral language (van Kleeck & Schuele, 1987). Kamhi & Catts (1986) define three types of reading deficits:

1. visual perceptual deficits.
2. phonological processing deficits.
3. comprehension deficits.

Stark (1981) defines two precursors to reading failure:

1. phonological difficulties.
2. semantic/syntactic difficulties.

Johns (1979) presents the importance of knowing the reading register, which is the terminology needed to teach reading, (i.e., word, sentence, paragraph.) Richgels (1982) draws a parallel between reading and oral language since there is a "common dependence upon syntactic and semantic constraints" (p. 48). Schuele & van Kleeck (1987) report that language disordered children often have reading problems and some are related to their language problems. Stark (1981) states

that "reading is intimately related to oral language. Success demands the integrity of phonological, semantic, syntactic and pragmatic aspects of language" (p. 93). As a result, this information reflects the inter-relationship between oral language, the precursors to reading, the act of reading and the integral role of the speech language pathologist in the development of reading.

Reading and Metalinguistics

Many of the tasks required when learning to read are metalinguistic in nature. Allan (1982) says that when children enter school, they are required to think consciously about language during reading. Mattingly (cited in Richgels, 1982) states that reading depends on linguistic awareness and this awareness is always prevalent during reading. Reading is defined by van Kleeck & Schuele (1987) as a language based skill involving knowledge of all aspects of language as well as metalinguistic ability. Most of the research to date has proposed that a degree of metalinguistic awareness is necessary for success in reading (Abramson, 1981; Allan, 1982; Bohannon, Warren-Leubecker, & Hepler, 1984; Evans, Taylor, & Blum, 1979; Flood & Menyuk, 1983; Gillet, 1979; Johns, 1977, 1979; Kamhi & Catts, 1986; Leong, 1984; Mann, Shankweiler, & Smith, 1984; Murray & Maliphant, 1982; Partridge, 1979; Templeton & Sulzby, 1980;

Templeton & Thomas, 1984; Zuccheromaglio, Pontecordo, Tonucci, & Blachowicz, 1986).

Schuele & van Kleeck (1987) present the interrelationship between language awareness and reading in terms of two factors:

1. "Children need to be aware that the relationship between words and the things they represent is arbitrary
2. that language is a system of elements (sounds and words) and rules for their combination (grammar)" (p. 19).

These two factors directly relate to three distinct components of metalinguistics, namely metaphonology, metasyntax and metasemantics.

Research in Reading and Language Disorders

Many previous studies have focused on the testing of metalinguistic skills of children from approximately five to seven years. Some studies have tested normal subjects while others have assessed the skills of the language impaired. Studies have focused on testing a variety of metalinguistic skills which can be divided into the three areas of metalinguistics: metaphonology, metasyntax and metasemantics.

Metaphonology

A critical metalinguistic variable involved in reading is phoneme identification and segmentation. Templeton & Thomas (1984) tested the ability of kindergarten, first and second grade children in segmenting phonemes. They found that children are capable of word analysis before phoneme segmentation. Templeton & Sulzby (1980) found that children at the beginning stages of reading tend to categorize phonemes rather than just segment them and they see this task as important for learning to read. Kamhi & Catts (1986) found that reading impaired and language impaired children, ages six to eight, performed poorer than normal children on metaphonemic tasks but that there were no specific differences between them. Leong (1984) found that phonemic segmentation tasks help children to understand the morpho-phonemes of English. Johns (1977) found that children in the age range of 5.6 to 9.5 had difficulty in segmenting phonemes and syllables. Phonemic segmentation of initial sounds is easier than final sounds (van Kleeck & Schuele, 1987). In general, phonemic awareness is necessary for beginning reading success (van Kleeck & Schuele, 1987) and language impaired and reading impaired children have difficulty in this area.

Metasyntax

Many studies of metalinguistic skills centered on metasyntax. It seems critical that in order to be proficient at reading, one must be able to extract and integrate not only word meaning but the meaning of the forms of language. Meaning is most complete when it is placed in the context of the understanding of the relationship of the parts to the whole and achieving proficiency in this area requires metasyntactic skill.

One component in this category involves making judgments about the appropriateness of a sentence in terms of grammaticality. Liles, Shulman, & Bartlett (1977) and later Kamhi & Catts (1986), Bialystok (1982) and Fujuki, Brinton, & Duton (1987) found statistically significant differences between normal and language disordered children in first, second and third grade in terms of their ability to make judgments about grammaticality. Scholl & Ryan (1980) found reading ability was directly related to the ability to judge sentence grammaticality. They tested the grammaticality judgments of kindergarten, second and fourth graders and found that those who had developed their reading ability scored higher on this task than pre-readers. Bohannon, Warren-Leubecker, & Hepler (1984) found that word order awareness in first graders may help in detecting meaning. Murray & Maliphant (1982) tested four areas of

error: graphemic, semantic, syntactic and semantic/syntactic in normal children ages seven to eight and found higher scores in the eight year group and in good readers. Kamhi & Catts (1986) found that reading impaired children's performance was weaker than normals in making morpheme judgments.

Perara (cited in Kamhi & Catts, 1986) revealed that reading is "high in lexical density and low in redundancy" (p. 107) so the importance of the need for the conscious awareness of grammar is evident. If redundancy is low, then there is a greater reliance on the understanding of the form as well as the meaning of the components. Mann, Shankweiler, & Smith (1984) revealed that poor readers had immature strategies for processing during reading, which resulted in reduced comprehension. This implies that their syntactic development is weak and that if they can be made more aware of metasyntax, their comprehension and reading skills may improve. They also found that poor readers rely more on extralinguistic cues. Metalinguistic awareness may be that extralinguistic cue that will improve reading. Flood & Menyuk (1983) also state that the awareness of the structure of language plays a role in reading development. They report that "reading requires readers to stand back from language... and conscious knowledge of the linguistic structures is frequently required" (p. 76) in reading.

Their study found the grammaticality task to be the one most correlated to reading ability.

In summary, all studies reveal that ability to make grammaticality judgments develops gradually during this period from age five to eight, and that good readers score higher than poor readers. Studies also reveal (Kamhi, 1987) that language impaired children also exhibit difficulties in this area and that metasyntax may assist in improving reading ability.

All research has focused on the ability to identify and correct grammatical errors but no information has been collected in terms of whether children are able to reformulate sentences from their constituent parts. This skill may also be a factor in determining reading and language ability.

Metasemantics

Word consciousness can be defined in terms of the ability to: (van Kleeck, 1984)

1. Define what a word is.
2. Judge which of the sound sequences presented are words.
3. Judge which segments of a sentence are words.
4. Demonstrate a conceptual differentiation between words and their referents.

Papandropoulou & Sinclair (1974) studied conceptions of a "word" in children ages four to ten. Results revealed that there were four levels of ideas concerning the definition of a word. Young children, age four, focus specifically on the objects and actions referred to by the word. Children, ages five to seven, use words to say or name things and children who are age six to eight can detach the word from its meaning. Children in the age range from eight to ten can explain the meaning of a word.

Numerous studies have analyzed the normal child's ability to make judgments about which sound sequences are words. Johns (1977) studied three groups of children, 5.6 to 6.5, 6.6 to 8.0, and 8.1 to 9.5, with regard to their ability to identify words. The two younger groups performed similarly in many categories and the older children were more adept at this task. The results of John's study also found that reading may influence a child's metalinguistic awareness of a word. Results also showed that metalinguistic awareness of a word also increases with age. It is suggested by van Kleeck & Schuele (1987) that word consciousness is necessary for beginning reading because many of the tasks required during this time of development require the identification and isolation of words.

Many researchers discuss the possibility that the inability to recognize words may have direct implications for reading achievement. Johns (1979) states "a child who

is unable to recognize a spoken word as different from a sound or syllable may experience difficulty in reading" (p. 2). Hoppe and Kess (1982) found that children can detect violations before they can explain them. These results make inferences to the importance of word consciousness as a prerequisite to reading.

Word consciousness is also a prerequisite when segmenting words in a sentence. Gillet (1979) states that word recognition and word analysis are important components of beginning reading. Ryan (cited in Waterhouse, Fischer, & Ryan, 1980) views word segmentation as one of the most important tasks associated with reading performance. Research by Holden and MacGinte (1979) reveal that children under five years are not able to isolate words in context and older children have trouble with certain word classes (function words). Ehri (cited in Yaden, 1984) also found that new readers have trouble segmenting function words. Templeton & Sulzby (1980) say that children must be able to segment speech before they can learn to read and write. She also says that segmenting is a way to integrate knowledge of form and meaning. Results of a study by Allan (1982) also point to a gradual acquisition of segmenting skills. He tested non-readers, those at the stage of reading readiness, and readers. Results indicate a relationship between reading ability and segmentation. Kamhi & Catts (1986), whose subjects ranged from 6.2 to 9.2, found that reading

impaired children had more difficulty than normal children in segmenting sentences.

Most of the research points to a one way relationship between word segmenting and reading. Most imply that the better one can segment, the better one can read. Ehri (cited in Yaden, 1984) states that word segmenting results from the ability to read. Ryan (cited in Waterhouse, Fisher, & Ryan, 1980) states "a certain level of linguistic awareness is prerequisite to successful beginning reading... likewise acquisition of reading skills can be predicted to enhance metalinguistic knowledge, especially awareness of word units" (p. 55).

Metalinguistic awareness implies that language can be manipulated, and Leong (1984) advocates that reading be taught in such a way that children understand this concept and become accomplished at this skill. He views the understanding of the relationship between oral language and reading as important and metalinguistic awareness can bridge the gap between these two modes of communication.

Statement of the Problem

In order to integrate the "how and why" of language, there needs to be a competence in the areas of metasyntax and metasemantics. Athey (1983) reports that abstracting meaning from print involves an understanding of the semantic and syntactic forms in order to draw the most information.

Stark (1981) states that reading failure may stem from syntax and semantic difficulties. Richgels (1982) believes there is a dependence on syntax and semantics in reading.

Research in the area of recognizing and segmenting words has concentrated on testing the abilities of kindergarten, first and second graders, and then inferences regarding good and poor readers were made from these results. Almost all of the data point to a significant correlation between word consciousness and reading. Results also show gradual developmental trends in the ability to recognize a "word" and then to be able to segment words. This ability seems to develop just before or during the reading process.

Although this information seems crucial to developing readers, there is no information regarding the effects of word consciousness tasks on poor readers specifically from groups who are beyond the age of acquisition of reading skills. Questions are raised concerning the ability of poor readers whose level of reading ranges from mild to severe. Are these subjects able to recognize words? Are they able to differentiate long words, short words, and function words or just content words? If they are able to recognize words, are they able to segment when words are presented in a sentence, in syllables and in phonemes.

It is also well documented that judgments of syntax acceptability are related to the ability to read. These studies analyze grammaticality judgments in general but no information has been obtained in terms of specific breakdowns based on particular grammatical classes. Also no information has been gathered concerning the abilities of reading impaired and language impaired children in terms of types of errors made in judgments. The ability to reformulate sentences, given the components, is a more complex step in the syntactic process. There has been no data gathered regarding this skill, and it also may be related to reading ability and may reveal differences in the abilities of good and poor readers.

Since it has been well documented that good readers have the ability to perform metasemantic and metasyntactic tasks, this study sought to address the question of whether there is a difference in the abilities of mild to severe reading impaired subjects in the area of metalinguistic skill. It also sought to isolate some components of metalinguistics that have an effect on reading and language. This study was designed to answer the following question: Is there a difference in the metalinguistic abilities of good readers, mildly impaired readers and severely impaired readers in the third grade?

Specifically:

I. Semantics:

1. Is there a difference in the way these groups define "a word"?
2. Is there a difference in the examples provided for
 - a) long words
 - b) short words
 - c) hard words
 - d) easy wordsand are their explanations semantically or syntactically based?
3. Is there a difference in the way each group identifies these words?
 - a) content
 - b) function
 - c) nonsense words
4. Is there a difference in the way each group segments:
 - a) sentences into words
 - b) words into syllables
 - c) words into phonemes

II. Syntax:

1. Is there a difference in the way each group makes syntactic judgments in the following categories:
 - a) syntax omission
 - b) syntax agreement
 - c) morpheme correctness

2. Is there a difference in the way each group reformulates sentences when provided with the component parts and is instructed to sequence them?

METHODOLOGY

The information in this study was compiled using a series of metalinguistic tasks aimed at assessing metasyntax and metasemantics (see Appendix A). The experiment was conducted with third grade subjects in the Orange County, Florida and Sumter County, Florida School Systems. Parental permission was obtained for each subject (Appendix B). These sessions were held in one sitting and took approximately thirty minutes. Subjects were informed that they had the right to withdraw from the testing situation if they so chose. Tasks were administered individually to each subject by graduate students in speech-language pathology who were trained in the administration and scoring of the protocol. The subjects were obtained from twelve different schools and were tested by five examiners including the researcher.

Subjects

A sample of sixty-two subjects was chosen from the urban population of the Orange County, Florida school system and the rural population of the Sumter County, Florida School System. Students' vision and hearing were screened by the individual school system and were found to be within normal limits during the past year.

Those students who passed both screenings were assigned to three groups balanced according to sex. The criterion for placement in each group was based on the scores obtained on the California Test of Basic Skills (CTBS).

1. Mild Reading Impairment: Scores in the 20 to 30th percentile on the reading subtest of the CTBS and the 40 to 67th percentile on the math subtest.
2. Severe Reading Impairment: Scores in the 1 to 10th percentile on the reading subtest of the CTBS and the 40 to 67th percentile on the math subtest.
3. Normal Reading Skills: Scores in the 40 to 67th percentile both on the reading and math subtests of the CTBS.

Instrumentation and Scoring

A series of metalinguistic subtests was constructed to assess metasemantic and metasyntactic abilities (Appendix A).

These tasks included:

1. Semantics: a) word consciousness
b) segmentation
2. Syntax: a) conflict sentences
b) sentence reformulation

1. Semantics:

a) Word Consciousness:

This task was designed to assess the child's concepts of different characteristics of a "word." First, subjects were asked, "what is a word?" and their answers were scored based on the semantic and syntactic categories. Then, subjects were asked to provide examples of words based on specific criteria. These items were scored in terms of the type of word and explanation provided and these responses were categorized as semantic or syntactic. Data were analyzed using a Chi square goodness of fit test.

Next subjects were asked to identify words from a list which included words and nonsense words. Items were scored based on whether words were identified correctly in each category.

These data were analyzed using a Chi square goodness of fit test.

b) Segmentation:

These tasks were designed to assess the subject's ability to segment language from an oral perspective. Segmenting abilities were judged in three categories:

1. segmenting sentences into words.
2. segmenting words into syllables.
3. segmenting words into phonemes.

1. The examiner read the sentences with normal prosody and intonation and the subjects were instructed to tap a block with their forefinger for every word in the sentence. A sentence was scored correct if every word was segmented as required.

2. The examiner provided the subject with a word presented orally and the subject was instructed to tap a block for every syllable in the word. Items were scored based on correct identification of all syllables.

3. The examiner provided a stimulus item orally and the subject was instructed to tap a block for every sound. Items were scored based on correct identification of all phonemes.

Data collected were analyzed using a Chi Square goodness of fit test for total number of errors. If this was found to be significant, a Chi square test for independence for type of errors and a proportions test to assess the specific areas of differences were performed.

2. Syntax:

a) Conflict Sentences:

This task was designed to determine the subject's ability to recognize and correct the grammatical aspects of language. The examiner read a sentence to the subject, who was instructed to judge whether the sentence was "ok or not ok."

If the sentence was judged to be incorrect, the subject was instructed to repeat the sentence, making the necessary corrections. Responses were scored as correct if the subject answered so that the sentence was grammatically correct.

Data were analyzed using a Chi square test of independence.

b) Sentence Reformulation:

This task was administered to assess the subject's ability to correctly sequence the components of language. Each subject was provided with single words written on cards and instructed to sequence them to form a sentence. This task was scored on the basis of correct grammatical sequence, cues and time required to complete each sentence in terms of minutes and seconds. These data were analyzed using a Chi square goodness of fit test, a Kruskal-Wallis H test and an analysis of variance test.

Procedure

Subjects who passed the hearing and speech screenings were administered the metalinguistics protocol. The examiner spent a few moments providing a general explanation of the tasks to the subject, thereby establishing rapport, and then the examiner began testing with the semantic subtest followed by the syntactic subtest. Responses were scored on the protocol (Appendix A) during testing, and

later the results were transferred to data summary spread sheets. Results were compared to reading skills and language skills based on the CTBS scores in each area and comparisons of sex were also analyzed.

RESULTS

The metalinguistic performance of third grade students, selected on the basis of their reading ability, was analyzed. In addition to reading skill, data were analyzed post facto in terms of language scores on the CTBS and sex. Subjects were grouped by average, mild problem and severe problem with the same CTBS criteria as the reading groups. Language scores ranged from 7% to 99% with a median score of 49.5% and a mean score of 47.5%. In most instances, and unless otherwise noted, a Chi Square goodness of fit or test for independence was used to test significance for each task. Results are discussed by individual task and are reported if they are statistically significant at or below the .10 level.

Section I

Task A: Word Consciousness

The word consciousness task was designed to identify how third grade subjects conceptualize different types of "words." The first task categorized these concepts based on whether they carried a semantic or syntactic meaning.

Results indicated no significant difference between how subjects characterize words in terms of reading skill, language skill or sex.

In the second task, subjects were presented with different types of words (difficult vocabulary, function words, content words and nonsense words). Subjects were asked to identify each as being, "a word or not a word." Significance was tested for subjects grouped by reading, language and sex, and only reading groups were found to differ in their responses. All three reading groups made the most errors on difficult vocabulary rather than function or nonsense words, and the fewest errors on content words. Subjects with severe reading problems made more errors on nonsense words than function words but those with mild reading problems and average readers made more errors on function words. The Chi square test showed there was a significant difference among reading groups at the .10 level ($\chi^2 = 11.67$) Table 1 lists the proportion of errors for each reading group.

TABLE 1

PROPORTION AND TYPES OF ERRORS FOR THREE READING
GROUPS ON THE WORD IDENTIFICATION TASK

Types of errors	Proportion of errors for three reading groups		
	severe	mild	average
Vocabulary	.58	.62	.57
Nonsense	.27	.15	.12
Function	.08	.18	.22
Content	.06	.04	.09

A proportions test was performed as a follow up to the Chi square test to test for the difference in error types between groups. A significant difference was found at the .10 level between the severe and average readers on the number of errors on nonsense words ($z = 1.82$). The proportions tests between readers with severe and mild problems on nonsense words and between readers with severe problems and average readers on difficult vocabulary were not significant.

Task B: Segmentation

Segmentation tasks were designed to test the ability of subjects to identify different components of oral language. The three categories that were assessed were segmenting words, syllables and phonemes. No significant differences were found among language groups or between males and females in the ability to segment sentences, but a significant difference was observed among the three reading groups on this task at the .05 level. The better the reader, the better the total score on segmenting sentences. This difference was in terms of the proportion of errors in total. Each group made more errors on sentences that contained words with more than one syllable, but there was no significance among groups in terms of the type of error.

Proportion tests were performed on the significant data to identify differences between reading groups. There was a significant difference between the severe and average reading groups at $p < .01$ and the mild and average reading groups at the $p < .05$ level and between severe and mild groups at the $p < .10$ level.

In segmenting syllables, a significant difference was observed among reading groups at the $p < .05$ level in terms of the total number of errors. The reading group with the most severe problem made the fewest errors, followed by the average readers, and the readers with mild problems made the most errors. A proportion test showed a significant difference between subjects with severe and mild reading problems at the $p < .05$ level and between average readers and those with mild problems at the $p < .10$ level. The difference between subjects with severe reading problems and average readers was not significant.

Significant differences were also noted in the total number of errors made between males and females at the $p < .05$ level. Males were found to make more errors than females. There were no significant differences among language groups on this task.

On the third segmenting task, phoneme segmenting, the only significant difference was found between males and females at the $p < .10$ level. Reading and language groups

showed no significant differences. A summary of the results of significant segmenting tasks grouped by reading groups and sex is presented in Figures 1 and 2, respectively.

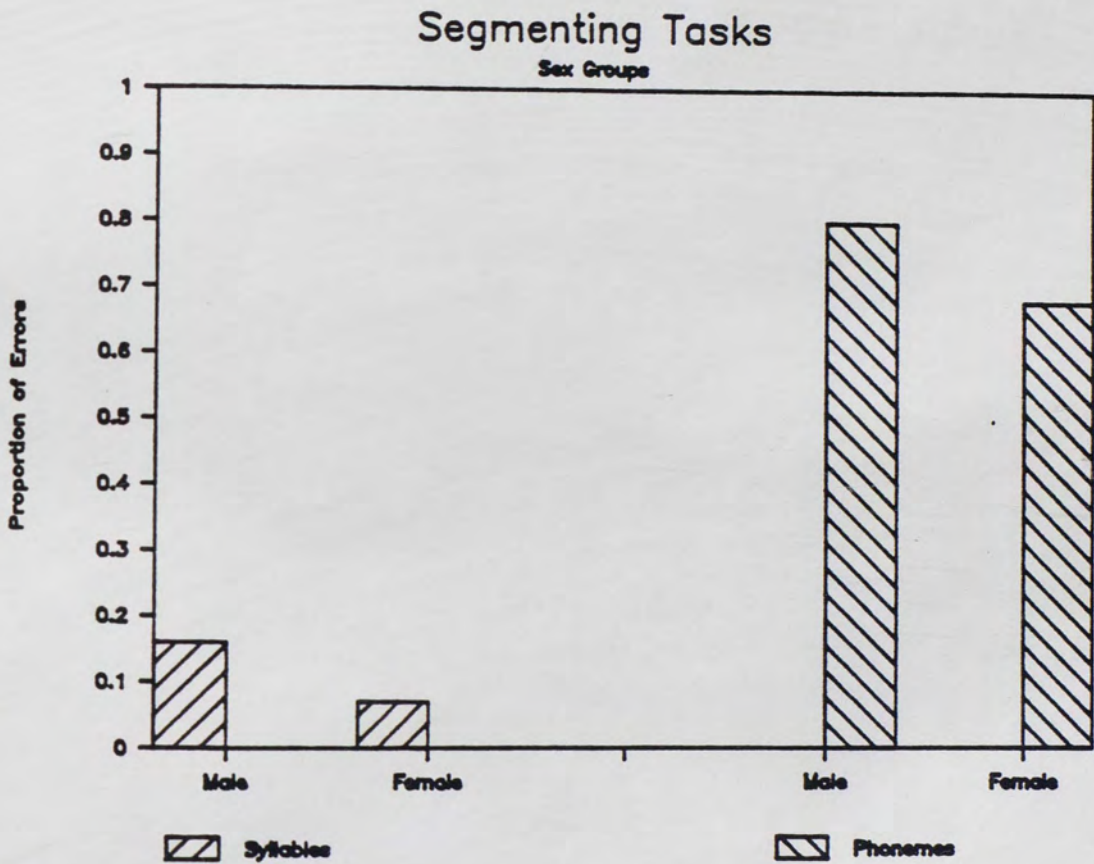


Figure 1. Proportion of Errors for Males and Females on the Segmenting Tasks.

Segmenting Tasks

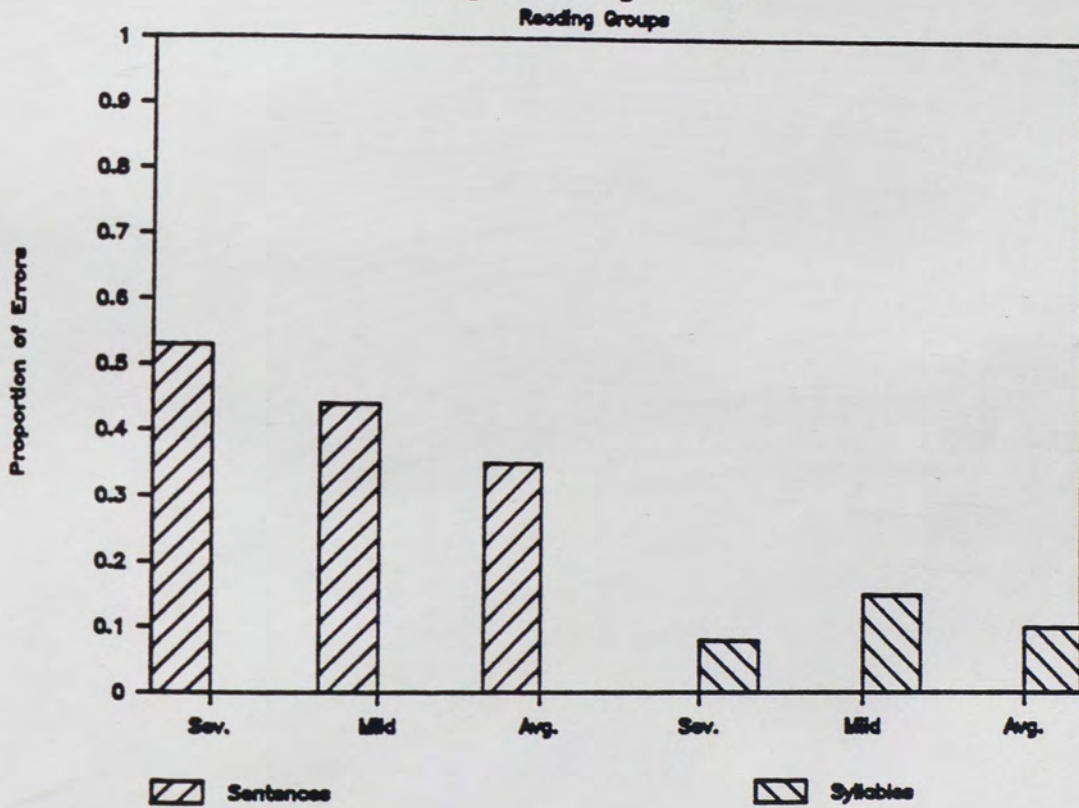


Figure 2. Proportion of Errors for Reading Groups on the Segmenting Tasks.

Section II

Task A: Conflict Sentences

The conflict sentence task was designed to assess the ability to recognize and correct sentences with syntactic errors. Results indicated that there were no significant differences among any groups (reading, language or sex) in the awareness of unacceptable syntax.

Task B: Sentence Reformulation

Sentence reformulation involved the ability to create and sequence a complete sentence when provided with individual words. The results collected were analyzed in terms of the time necessary to formulate the sentence, the number of cues needed in that time period and whether or not the sentence created was grammatically correct. A Kruskal-Wallis H test was used to test possible differences between the mean times and mean number of cues among groups because of the size. With this statistic, time was not found to be a significant factor among any of the groups, but reading groups did differ in terms of the number of cues required at the $p < .10$ level. Results followed a predictable pattern, with the severe reading group needing the most cues, followed by the group with mild reading problems, and the average readers needed fewer cues than any other group. A multiple comparisons test was then used to determine which groups were statistically different.

Significant differences were found between the poor readers and those with mild problems and with the poor readers and the average readers at the $p < .15$ level.

In addition to analysis of time with a Kruskal-Wallis H test, an analysis of variance test was performed on the individual times of each group. There were no significant differences in the amount of time on this task between males and females, but significance was found between reading groups at the $p < .05$ level and between the language groups at the $p < .10$ level. A Newman-Keuls test was performed post facto to identify the area of significance among the groups. Significance was found between the readers with severe problems and the readers with mild problems and also between the readers with severe problems and the average readers.

A Chi Square test for independence was used to analyze the difference between the number of error sentences. This factor was not found to be significant among the reading groups, language groups or between males and females.

DISCUSSION

The purpose of this study was to identify differences in the metalinguistic abilities of third grade students with different reading skills. The results indicated that students with varied reading skills do differ in their ability to perform certain metasemantic and metasyntactic tasks. It was also found that females scored higher than males on certain metasemantic tasks but not on metasyntactic tasks. When language scores of subjects were grouped and compared with these metalinguistic tasks, there were no significant differences in metalinguistic ability except for the time required to reformulate sentences.

The most significant metalinguistic tasks that showed variability by reading groups were word identification, segmenting sentences, segmenting phonemes and the time and number of cues during sentence reformulation. Since segmenting syllables also showed a significant difference between sex groups, this task may not be a strong, clear variable indicating reading ability. Also, since the amount of time required to reformulate sentences differed among language groups, this may not be a single important variable in differentiating reading skill.

The metalinguistic tasks that showed significance in the reading area only are the metasemantic tasks of word identification and segmenting sentences and the metasyntactic task involving the number of cues needed to reformulate a sentence. Third grade students who are better in reading were better able to manipulate the metasemantics of identifying word types than those who have difficulty reading. When asked to identify "words" during this second task, subjects made the most errors on difficult vocabulary and the least on content words. There was inconsistency in terms of the nonsense and function words. The poor readers made more errors on nonsense words, and the mild problem readers and average readers made more errors on function words. Previous research indicates that poor readers have difficulty identifying function words. There is no obvious answer as to why poor readers were better able to identify function words, but had difficulty with nonsense words, and further research is needed in this area. Since poor readers had the most difficulty in most areas, it may be that their reading problems are enhanced by the inability to make recognition judgments about all words, not just certain types.

The task of separating words within sentences also showed a predictable and significant difference in terms of reading skill. The significant differences found between

each level of reading ability indicate that there are at least three levels of segmenting skill at the sentence level and this skill contributes to increased reading ability. Results from this study concur with that of previous research on sentence segmenting skills and reading, and reveal that this task is still a critical variable of reading even beyond the years of beginning reading. Further research is needed to better identify these levels of segmenting ability in reading groups.

Better readers were able to manipulate words to create sentences in the metasyntactic task of sentence reformulation with less time and without as much assistance. Poor readers needed more cues and a greater amount of time than the readers with mild problems and the average readers. These results show that it may be much more difficult for poor readers to efficiently analyze words in a reading passage on their own and use syntactic context to assist them in understanding the passage. There is no published data on this task at this time and more research is needed to begin to analyze the types of syntactic structures that are more difficult.

These three metalinguistic tasks, all statistically significant in terms of reading ability, seem to be integral components and critical to successful reading ability. They all involve the ability to identify words in different contexts and situations as well as being able to manipulate

the words to break down or create more complex language structures. Thus the auditory skill of identification and segmenting of words and the visual skill of reformulating words to create sentences are tasks that form an integral part of reading ability.

In addition to statistically significant results, there was a variety of information gathered regarding the general skills of third grade readers and metalinguistics. On the first semantic task, word consciousness, the subjects were required to provide examples of different types of "words." This task revealed that at this age most responses are no longer based on a semantic concept but mainly provide syntactic responses. This is consistent with the findings of previous research, which states that children first develop semantic responses during the preschool years and later can answer syntactically.

The first segmentation task, segmenting sentences, revealed a significant difference in the total number of errors made among reading groups but not on the type of errors. No students failed to segment the function words, but all three groups made more errors on words with more than one syllable. It was interesting to note that most subjects had more trouble with two syllable words than words with more than two syllables. The degree of stress placed on each syllable also made a difference in responses for two syllable words. When the words had equal stress on each

syllable, as do compound words, the subjects generally considered these words as two instead of one.

Segmenting syllables also showed a statistically significant difference between reading groups, but all three groups scored better in this area than any other segmenting tasks. This information is consistent with previous research findings. The ability to segment syllables is the first skill to emerge in terms of segmenting oral language. Observation revealed that the poor readers did better on this task than the other two groups, and the mild problem readers had the lowest score. This may be because the children who have severe problems with reading receive specific instruction in segmenting syllables to improve their reading skills. Segmenting syllables may not be the focus of remediation for those with mild reading problems.

All three reading groups performed poorly on the phoneme segmenting task and responded by counting syllables instead of sounds. Previous research is inconsistent in this area since some studies state that by third grade students can segment by "sounds," while others reflect that by age nine some children have not yet mastered this skill. In this sample, all three groups had difficulty with this task. Of the students who were able to segment certain words into phonemes, the words were usually only one syllable words. In addition, 40 some subjects were able to do the first few one syllable words but as soon as a two

syllable word was introduced they reverted back to responding by counting syllables. These subjects may be in a transition stage in which this skill is just beginning to emerge.

There were no significant differences between the conflict sentence task and reading groups, and this conflicts with results drawn from previous studies. Although there was no significance, there were some interesting trends. Sentence errors were divided into three types: verb errors, auxiliary/copula errors, morpheme errors and foils which were correct. The poor readers made almost an equal proportion of errors on all four groups. The other two groups made the most errors on auxiliary/copula errors and fewer errors on the foils. These two groups also performed better on sentences with main verbs and morpheme errors. Although not statistically significant, the poor readers had trouble with all of the parts of speech tested and the better readers had trouble only in certain areas. A study with a larger sample size or a population with more varied reading skills may reveal that those with poor reading skills, who are not able to recognize a variety of syntactic forms in language, also have difficulty performing this same task while reading.

The conflict sentence task revealed some other valuable information about third grade subjects and their metasyntactic skill. Most subjects made errors on six of

the thirty sentences. These errors included comparative adjective confusion, irregular past tense verbs, pronoun position when there was more than one object, use of the appropriate form of the article when the noun begins with a vowel, subject/verb agreement with regard to correct form of the auxiliary verb and auxiliary verb use in "wh" questions. These data contrast previous information since most of these syntactic units have been shown to have developed much earlier, and errors should be eliminated by third grade. Further research testing these specific syntactic forms would be beneficial.

On the sentence reformulation task, in addition to significance found for reading groups in time and number of cues, there were several trends observed that merit discussion. Although there was not a significant difference in the number of errors made by the three reading groups, there was a consistency of errors among all three groups. Most subjects were able to reformulate declarative statements containing only one complex structure, either a prepositional phrase or a conjoining conjunction, with little difficulty. Many subjects found it difficult to reformulate the statement with two difficult structures such as an infinitive and a prepositional phrase. These subjects placed the prepositional phrase first, and then they could not fit the infinitive in a proper place. They also had difficulty formulating the compound question with numerous

pronouns, and became confused with the question because of the number of possible places for the pronouns. They also had difficulty with the compound sentence which contained a pronoun which served as the subject of the second part of the sentence and referred to the main subject. They preferred to create a sentence with a compound object and felt as if the second subject could not be used. Further research in this area with a larger sample of examples would provide useful information regarding poor readers' ability to use specific, complex syntactic components.

This research project was an initial look into the metasemantic and metasyntactic skill of third grade children with varied reading abilities. Several tasks showed significance and serve to defend the proposal that there is an interrelationship between metalinguistics and reading. This study has shown that not only is metalinguistics important to reading at the pre-reading and early-reading years, but that it impacts the abilities of children who are having difficulty at all stages of learning to read.

Some of the tasks performed in this study did not show significance but did show interesting trends. Larger sample sizes may lead to significance in the number of errors on sentence reformulation and type of errors on word identification, conflict sentences and segmenting syllables.

An initial statement can be made that remediation in some of the areas of metalinguistics may lead to improving reading skill. Further research is needed to verify that metalinguistic treatment does improve reading skill before definitive statements can be made regarding the efficacy of this type of treatment.

APPENDICES

APPENDIX A

METALINGUISTIC TASKS

I. Semantics

- a. Word Consciousness: (Items 1-5 are taken from Kamhi,
Lee & Nelson, Word, Syllable and
Sound Awareness, JSHD, 50, 210.)

1. What is a word? _____

2. Tell me a long word and what makes it long?

1. _____

2. _____

3. _____

3. Tell me a short word and what makes it short?

1. _____

2. _____

3. _____

4. Tell me a hard word and what makes it hard?

1. _____

2. _____

3. _____

5. Tell me an easy word and what makes it easy?

1. _____

2. _____

3. _____

6. Is _____ a word?

- | | | | |
|---------------|-------|-------------------|-------|
| 1. mop | _____ | 11. skagle | _____ |
| 2. and | _____ | 12. my | _____ |
| 3. selber | _____ | 13. differentiate | _____ |
| 4. happy | _____ | 14. the | _____ |
| 5. a | _____ | 15. thook | _____ |
| 6. is | _____ | 16. comprehension | _____ |
| 7. puddle | _____ | 17. blue | _____ |
| 8. dop | _____ | 18. lunar | _____ |
| 9. allegation | _____ | 19. zin | _____ |
| 10. silly | _____ | 20. hybrid | _____ |

- b) Segmentation:
1. Use blocks to represent units.
 2. Clinician presents sentences aloud.
 3. Client repeats and points to blocks.

1) segmenting words in a sentence. number of blocks

- | | |
|--------------------------------------|-------|
| 1. Throw the ball. | _____ |
| 2. I want some gum. | _____ |
| 3. John found a small green frog. | _____ |
| 4. Mary likes cartoons. | _____ |
| 5. The cat walked across the street. | _____ |
| 6. Where are you going? | _____ |
| 7. This is my birthday cake. | _____ |
| 8. We went to the baseball game. | _____ |
| 9. Yesterday was a sunny day. | _____ |
| 10. Are you ready to go? | _____ |

2) segmenting words into syllables.

- | | | | |
|-----------|-------|--------------|-------|
| 1. hotdog | _____ | 6. Halloween | _____ |
| 2. lamp | _____ | 7. car | _____ |
| 3. table | _____ | 8. baseball | _____ |
| 4. yellow | _____ | 9. bicycle | _____ |
| 5. radio | _____ | 10. truck | _____ |

3) segmenting words into phonemes.

- | | | | |
|----------|-------|-----------|-------|
| 1. play | _____ | 6. sun | _____ |
| 2. go | _____ | 7. bike | _____ |
| 3. throw | _____ | 8. phone | _____ |
| 4. after | _____ | 9. family | _____ |
| 5. silly | _____ | 10. and | _____ |

II. Syntax

a) Conflict Sentences:

Read each sentence to the subject and ask:

1. is the sentence "ok or not ok"?
2. if it is not "ok" how would you change it?

- | | |
|-------|-----------------------------------|
| _____ | 1. My favorite fruit is a orange. |
| _____ | 2. We loves to go to the movies. |
| _____ | 3. Alice and Jane are my sisters. |
| _____ | 4. Why you doing your homework? |
| _____ | 5. The cat are wet. |
| _____ | 6. Mother have a new blue dress. |

- _____ 7. Jeff threw baseball.
- _____ 8. We walk school everyday.
- _____ 9. My brother and I slept on the floor.
- _____ 10. Mom made sandwiches for lunch.
- _____ 11. Sally loves their new bike.
- _____ 12. The birds a big nest.
- _____ 13. I brush my teeth every morning.
- _____ 14. Bill and Joe is riding their bikes.
- _____ 15. The concert was very crowded.
- _____ 16. Has you finished your work?
- _____ 17. They were bests friends.
- _____ 18. My bike is biggest than yours.
- _____ 19. You my friend?
- _____ 20. Where are you going?
- _____ 21. I am rake leaves.
- _____ 22. Terry drove the car often.
- _____ 23. John not go to school with me.
- _____ 24. Mike went to the circus.
- _____ 25. Help me carry the books the table.
- _____ 26. The frog jumped out of the bucket.
- _____ 27. When do he eat lunch?
- _____ 28. Dad is take us to the game.
- _____ 29. He sings and plays the guitar.
- _____ 30. She rides to school with me and Jane.

APPENDIX B
PERMISSION FORM

Dear Parent or Guardian,

As a student in Speech and Language at the University of Central Florida, I am working on a project which is part of earning my master's degree and the purpose is to learn more about the way that children read. The results will be used to help children who have trouble reading improve their skills. The children who participate in the study will take part in a series of language activities which will last approximately forty-five minutes. Information will be kept confidential as no names will be used in the study. I would appreciate your permission to include your child in this study. If you have any questions please feel free to contact Dr. Dona Lea Hedrick at the University of Central Florida (275-2354). Thank you for your cooperation.

Please return this form to
classroom teacher on or
before Monday (12/14/87).

Valerie Lovegreen, B.S.
Graduate Student
University of Central Florida

_____ I give my permission for my son/daughter to
participate in the language activities.

_____ I do not give my permission for my son/daughter to
participate in the language activities.

Date: _____

Signature: _____

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