Metalinguistic Awareness in Normal and Language-Disordered Children

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The purpose of this study was to better understand the relationship between delayed linguistic performance and metalinguistic abilities. A metalinguistic task involving the identification and revision of syntactic, semantic, and phonologic errors was administered to 10 normal and 10 language-disordered children of comparable mental age and receptive language abilities. The two groups performed similarly in identifying and correcting semantic and phonologic errors. However, the language-disordered children performed significantly poorer than the normal children in identifying and correcting syntactic errors. These findings suggest that not only do language-disordered children take longer to understand and produce certain language forms, but they also take longer to access this knowledge once it is acquired.

Metalinguistic awareness has been defined as "the ability to reflect consciously on the nature and properties of language" (van Kleeck, 1982, p. 237). In recent years there has been a surge of interest in normal children's development of metalinguistic awareness (Clark, 1978; Hakes, 1980, 1982; Kuczaj & Harbaugh, 1982; Leonard, Bolders, & Curtiss, 1977; Saywitz & Wilkinson, 1982; Smith & Tager-Flusberg, 1982). In general, the data indicate that making explicit, out-of-context linguistic judgments is relatively difficult to do compared to talking and understanding. Children are usually not able to make such judgments until age four, and in some cases not until ages 7 or 8 (Hakes, 1982; Smith & Tager-Flusberg, 1982). Reports of 2- and 3-year-old children making metalinguistic judgments most often involve judgments that serve communicative functions, such as correcting one's speech in response to self-monitoring or listener feedback and adapting one's speech to the needs of one's listener (van Kleeck, 1982). As van Kleeck notes, young children focus on the content of the message conveyed by language rather than the linguistic form used to convey the message.

The literature suggests several possible reasons why it is more difficult to make explicit judgments about linguistic form than it is to learn to talk and understand. First, more attention-demanding processes are thought to be involved in metalinguistic tasks than in natural speaking and listening situations (Hakes, 1982). This is because explicit judgments about linguistic form involve retrieving specific

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linguistic knowledge that is often not readily accessible. In natural speaking and listening situations, most phonologic and syntactic decisions are carried out by automatic, nonattention-demanding processes.

A second possible reason it is difficult to make explicit metalinguistic judgments is that these judgments often treat language out of its normal communicative context. Whereas comprehension is usually facilitated by contextual information, language judgments often require a decision based only on the sentence itself (see Franklin, 1979). For this reason, making out-of-context linguistic judgments is often a novel task for many children (see Olson, 1980, for an interesting discussion of this point).

Third, judgments of grammatical appropriateness require the knowledge that language consists of discrete elements (i.e., sounds, syllables, words, and phrases). This knowledge is not needed in most speaking and listening situations. Children who do not know that language consists of discrete elements will most likely make language judgments based on message content rather than form (Read, 1978).

Finally, an accurate language judgment requires attention to and discernment of the language unit targeted by the metalinguistic task. Rarely does successful communication depend solely on attention to and discernment of a specific linguistic form. In natural speaking and listening situations, contextual redundancies and familiar communicative situations reduce the need to process discrete linguistic units.

These differences between metalinguistic and linguistic performance have been used to support the view that explicit metalinguistic judgments play little or no role in normal children's first language acquisition (Clark, 1978; Hakes, 1982). However, there is considerable evidence (see Hakes, 1982) that metalinguistic performance plays an important role in learning how to read. Of primary concern in this paper is the likelihood that metalinguistic performance also plays an important role in teaching language to children who suffer from linguistic deficits. Children with deficient or inefficient comprehension and production processes might have to rely on their metalinguistic abilities in order to learn certain aspects of language. Although it is often not acknowledged, many language assessment and intervention procedures have strong metalinguistic performance components. Any language assessment tool that evaluates language out of its normal communicative context (e.g., the NSST (Lee, 1969) and TACL (Carrow-Woolfolk, 1970) is, in part, tapping metalinguistic performance. Language training also often requires explicit metalinguistic judgments. For example, oftentimes after producing an utterance, a child in therapy is asked to judge whether or not the sentence was a "good" one (see van Kleeck, 1984, for further discussion of these points).

Given the important role that metalinguistic performance might play in the language intervention process with language-disordered children, a better understanding of the relationship between delayed linguistic performance and metalinguistic performance is needed. In one of the few studies examining metalinguistic abilities of language-disordered children, Liles, Schulman, and Bartlett (1977) compared the ability of 5- to 8-year-old language-disordered children and normal children to judge and correct sentences containing syntactic, lexical, and word-order errors. The children were matched for age and receptive vocabulary

as indicated by the PPVT (Dunn, 1965). Several differences were found in the two groups' metalinguistic performances. First, the normal group was able to identify significantly more syntactic and word-order errors than the language-disordered children. The language-disordered children had particular difficulty identifying syntactic errors. Second, the normal children were able to correct almost all (90%) of the sentences that they judged to be agrammatical. In contrast, the language-disordered children could only make appropriate revisions on 21% of the syntactic errors, 42% of the lexical errors, and 41% of the word-order errors that they were able to identify. The language-disordered children clearly had the most difficulty identifying and correcting syntactic errors. The authors suggest that the language-disordered children's poor performance might be due to their inferior comprehension abilities. Another possibility is that the language-disordered children were functioning at a lower cognitive level than the normal children. Recall that the groups were matched for CA and receptive vocabulary and not cognitive level. The metacognitive abilities of the disordered children thus might be somewhat lower than those of the normal children.

To explore these possibilities, this study evaluated the metalinguistic abilities of normal and language-disordered children of comparable nonverbal performance MAs and receptive language abilities. The metalinguistic task was similar in format to the one used in the Liles et al. (1977) study with the exception that phonologically anomalous sentences were included instead of sentences with word-order errors. The inclusion of phonologically anomalous sentences made it possible to compare children's metalinguistic performance across the three language domains of syntax, semantics, and phonology.

Method

Subjects were 10 language-disordered children (7 boys) and 10 normal children (6 boys) ranging in age from 4:0 to 7:2. The normal children were individually matched for MA to the language-disordered children according to performance on the Columbia Mental Maturity Scale (Burgemeister, Blum, & Lorge, 1972). All the children were administered the receptive portion of the Northwestern Syntax Screening Text (NSST-R, Lee, 1969) as a measure of receptive language and the Peabody Picture Vocabulary Test (PPVT, Dunn, 1965) as a measure of receptive vocabulary. No significant differences were found between the two groups on either of these tests (see Table 1), though the normal group did show higher mean scores than the disordered group, in particular, on the PPVT. Note, however, the particularly high standard deviations for each group on the PPVT, indicating that there was considerable variability in each group's performance on this test.[1]

[1]The rather large discrepancy in standard deviation scores for the two groups on the PPVT (10.6 compared to 21.8) suggests that a nonparametric analysis might have been more appropriate for this comparison. PPVT scores for the two groups, therefore, were compared using the nonparametric Mann Whitney U Test. This test, which is based on a rank-ordering of the data, also revealed no significant group differences at the .05 level ($U = 28$).

TABLE 1. Group means and standard deviations (SD) for CA, receptive vocabulary MA (PPVT-MA), performance IQ (PERF-IQ), and receptive language (NSST-R).

	Language-disordered	*Normal*	*t-ratio*
CA			
Mean	72.0	62.9	2.30*
SD	8.2	9.4	
PPVT-MA			
Mean	59.7	74.2	1.89 (NS)
SD	10.6	21.8	
PERF-IQ (Columbia ADS)			
Mean	96.8	108.0	1.75 (NS)
SD	14.7	16.0	
NSST-R			
Mean	27.2	30.4	1.51 (NS)
SD	5.5	3.8	

*$p < .05$

Controlling for nonverbal intelligence and receptive language skills resulted in the normal children being slightly younger than the language-disordered children. As can be seen in Table 1, the mean age discrepancy of nine months was significant at the $p > .05$ level. This age difference caused the normal children to have somewhat higher age deviation scores (ADS) on the Columbia than the disordered children.

All of the language-disordered children were previously diagnosed as suffering from a primary language disorder by a certified speech-language pathologist. The language impairment in these children was not the result of globally depressed intellectual functioning, severe emotional disturbances, hearing loss, or physical defects. Furthermore, all of these children performed within normal age limits on the Columbia Mental Maturity Scale, a measure of nonverbal intelligence. As an indication of their language disorder, all children obtained scores under the 10th percentile on the Bankston Language Screening test (Bankston, 1977) and performed at least 1 year below age level on the PPVT or the NSST-R. All the children were receiving language therapy in a school setting at the time of testing. The normal children came from the same geographical region as the language-disordered children. None of the normal children had any reported history of speech, language, or hearing problems.

Test Instrument

The metalinguistic task consisted of 28 randomly arranged sentences. There were 21 anomalous sentences, seven containing a syntactic error, seven, a semantic (lexical) error, and seven, a phonologic error. The remaining seven sentences contained no grammatical error. Thus, there were four general sentence types: (a) syntactically anomalous, (b) semantically anomalous, (c) phonologically anomalous,

and (d) correct. The seven sentences for each sentence type were constructed to reflect seven different grammatical structures: past tense inflection (-ed), negation (doesn't), progressive aspect (is + Ving), interrogative reversal, possessive -s, plural, and third-person singular -s. In this way, the grammatical structures of the sentences for each of the four sentence types was held constant. A copy of the test instrument appears in the Appendix.

Procedures

After the children were administered the PPVT, the Columbia Mental Maturity Scale, and the receptive portion of the NSST, the metalinguistic task was presented. The responses to the metalinguistic sentence stimuli were elicited using a puppet scenario in which the child was asked to help the "teacher" puppet correct "the puppet who cannot talk so well." Several sample sentences were presented. For each sentence, the experimenter asked the child whether the sentence was a good one or not. If the child replied that it was not, he/she was asked to correct it.

Children's responses were recorded and transcribed during the experimental session. The live transcriptions were compared to the transcripts made from the taped session. There was agreement for over 94% of the sentences. Disagreements were resolved through discussion between the two authors.

Scoring Procedures

The scoring procedures used were essentially similar to those reported in the study by Liles et al. (1977). A child's response to the question "Is this a good sentence" was considered correct if the child responded "Yes" when the sentence did not contain an error and "No" when the sentence contained an error. A change or sentence revision was judged to be correct if the child recognized the error in the sentence and made the specific changes necessary to correct the error. Correct revision scores thus were given only when the targeted error was corrected. Modification of other parts of the sentence, whether grammatical or not, were not considered in judging the appropriateness of a revision. For example, if a child responded, "Jill drank four milks" to the sentence "Jill ate three milks," a correct revision would be scored because the verb is now correct. The child would not be penalized for changing the number of milks from three to four.

Results

Within-Group Comparisons

The data consisted of the number of correct judgments and revisions children made on the stimulus sentences. The first set of analyses compared the language-disordered and normal children's ability to identify and revise the three different types of anomalous sentences (i.e., syntactic, semantic, and phonologic). A Friedman Two-Way Analysis of Variance (Siegel, 1956) found significant differences in the language-disordered group's ability to identify and correct the three sentence types [Ident: $\chi^2 = 7.85$, $p < .02$; Revision: $\chi^2 = 14.45$, $p < .01$]. A Wilcoxon Matched

TABLE 2. Identification and revision of anomalous sentence types.

Group	Sentence type: Syntactic Ident	Syntactic Rev	Semantic Ident	Semantic Rev	Phonologic Ident	Phonologic Rev
Language-disordered						
Mean	3.2	0.4	5.4	2.9	4.6	1.5
SD	0.9	0.5	1.0	1.2	1.0	1.0
Normal						
Mean	4.8*	2.0**	5.5	3.5	5.0	2.1
SD	1.5	1.9	2.3	1.4	1.2	1.4

*$p < .05$
**$p < .01$

Pairs Signed-Rank Test (Siegel, 1956) indicated these children had more difficulty identifying syntactic errors than identifying semantic and phonologic ones ($p < .01$). Revisions of syntactic errors also proved to be significantly more difficult to make than revisions of semantic and phonologic errors (Wilcoxon Test, $p < .01$). In addition, revisions of phonologic errors were more difficult than revisions of semantic errors (Wilcoxon Test, $p < .025$). In contrast to the language-disordered children's varying ability to identify and correct the anomalous sentences, the normal children did not differ significantly in their ability to identify or correct the three error types [Ident: $\chi^2 = 3.06$, $p > .10$; Revision: $\chi^2 = 2.4$, $p > .10$].

Between-Group Comparisons

The next series of analyses compared the performance of the disordered and normal children. In examining the means and standard deviations in Table 2, one is struck by the children's relatively similar ability to identify and correct semantic and phonologic errors. No significant differences were found between the two groups involving these sentence types. In contrast, significant differences in favor of the normal group were found both in identifying and correcting syntactic errors (Mann-Whitney U Test, $p < .05$ and $p < .01$, respectively). The difficulty the language-disordered children had in making syntactic judgments and revisions was consistent with the findings of Liles et al. (1977). The disordered children in the current study were more like their normal counterparts in their ability to revise semantic and phonologic errors.

Correlational Analyses

The final analyses explored the relationship between the various descriptor variables and syntactic judgment abilities. Within-group Kendall rank correlation coefficients were calculated only for the two syntactic measures because this component of the metalinguistic task was the only one that differentiated significantly between the two groups. The only coefficient that was significant at the p .05 level involved the NSST and revision scores for the normal group (see Table 3).

TABLE 3. Kendall rank correlation coefficients between syntactic metalinguistic performance and age, cognitive and language measures.

Group	*CA*	*MA*	*PPVT*	*NSST-R*
Language-disordered				
Syn-Ident	−.40	−.40	−.21	−.21
Syn-Rev	−.15	.05	−.15	.17
Normal				
Syn-Ident	.14	0	.12	.37
Syn-Rev	.37	.23	.30	.51*

*$p < .05$

Low, moderate negative coefficients obtained between CA/MA and the identification scores for the language-disordered children ($p = .066$). Finally, low, moderate coefficients obtained for the normal group between CA and revision scores and between NSST and identification scores ($p = .078$).

Discussion

This study compared the ability of normal and language-disordered children to identify and correct syntactic, semantic, and phonologic errors. Previous research involving language-disordered children (Liles et al., 1977) found that these children have more difficulty than age-matched normal children identifying syntactic and word-order errors and revising all sentence types. The language-disordered children had particular difficulty identifying and correcting syntactic errors. In the current investigation, language-disordered children were also found to have particular difficulty identifying and revising syntactic errors. In contrast to the earlier study, however, the language-disordered children and normal children demonstrated comparable skill in correcting other sentence errors, in this case, semantic and phonologic ones. Controlling for mental age and language comprehension appears to have eliminated the nonsyntactic-related differences found in the Liles et al. (1977) study.

Semantic Judgments

Of the three grammatical judgments evaluated in this study, previous research with normal children (cf. Clark, 1978) has found that making judgments about semantic appropriateness is the easiest. The finding that the language-disordered children had significantly less trouble correcting semantic errors is consistent with the normative data. Given that the normal and language-disordered children were matched for MA, it is perhaps not surprising that no differences were found with these sentence types. The language-disordered children's metacognitive abilities were apparently sufficient for making out-of-context judgments about semantic appropriateness.

Phonologic Judgments

Correcting phonologic errors has been found to be as difficult if not more difficult than correcting syntactic errors (Clark, 1978; Smith & Tager-Flusberg, 1982). For this reason, it was somewhat surprising that no differences were found between the two groups involving these sentence types. There are at least two possible explanations for this finding. First, it might be that neither group had the knowledge of phonologic units needed to be able to correct phonologic errors. The knowledge that language consists of discrete phonologic units often is not acquired until children learn how to read (Read, 1978). The fact that most of the children had little or no formal reading instruction was probably an important factor in the similar performance of the two groups. A comparison between slightly older normal and disordered children (e.g., age 7–8) might well reveal some differences in the ability to revise phonologic errors. Normal children of this age will invariably be better readers than their language-disordered peers and, as a result, know more about sound-letter correspondences than would disordered children.

A second possibility was that the nature of the metalinguistic task focused children's attention on syntactic and semantic features rather than phonologic ones. Both language-disordered and normal children generally had little difficulty identifying phonologic errors but usually revised these sentences by making a semantic change. For example, a child who identified the sentence "John has two tig cars" as being wrong, changed it to "John doesn't have two cars; he only has one." Thus it was possible that some of the children had knowledge of phonologic units but did not use this knowledge because their attention was directed on the semantic or syntactic appropriateness of the sentences. If this were in fact the case, then a better focused phonologic judgment task might reveal significant differences in the two groups' ability to correct phonologic errors.

Syntactic Judgments

Despite the formal training the language-disordered children had in judging syntactic appropriateness in therapy, they still performed more poorly than normal controls in identifying and correcting syntactic errors. This finding was consistent with the results from the Liles et al. (1977) study. It is conceivable that without formal language training, the disordered children would have performed even more poorly on the metalinguistic tasks.

The most obvious reason for the language-disordered children's poor syntactic judgment abilities is that they had less "primary" linguistic competence than the normal children. That is, their ability to understand and produce the targeted syntactic structures was inferior to that of the normal children. As van Kleeck (1982, p. 256) notes, "clearly metalinguistic skill requires some primary language competence, if only because the child must have *something* to reflect upon." What is unclear, however, is how much primary linguistic knowledge is necessary for a child to make accurate metalinguistic judgments. For example, is comprehension of a form sufficient or must the child also be able to accurately produce the form as well? Liles et al. (1977) suggested that a comprehension deficit provided the most likely explanation for their language-disordered children's inferior metalinguistic

performance. However, several findings from the current investigation suggest that a comprehension deficit was not primarily responsible for the language-disordered children's inferior syntactic judgment performance.

First, the language-disordered and normal children had similar comprehension abilities as measured by the receptive portion of the NSST. Second, no relationship was found between the language-disordered children's performance on the NSST (or PPVT) and syntactic judgment performance. The individual subject data show that the most advanced children on these language measures performed as poor or poorer on the metalinguistic task as the least advanced children on these language measures. Finally, comprehension of a particular syntactic form by no means ensured that an accurate identification and revision would be made. This is best seen with the normal children. Based on developmental language data (e.g., Miller, 1981), normal 5-year-old children understand and produce all the syntactic forms targeted in the metalinguistic task. Yet despite the apparent ability to comprehend and produce these linguistic forms, the normal children in this study could correct only about one fourth of the errors involving the use of these forms.

Explaining Metalinguistic Performance

It appears, then, that factors other than a comprehension deficit were responsible for the language-disordered children's inferior syntactic judgment abilities. In the introduction, four reasons were given to explain why it is often difficult for young children to make explicit metalinguistic judgments. These were: (a) the need to use attention-demanding processes to access different levels of linguistic knowledge; (b) the need to treat language out of its normal communicative context; (c) the knowledge that language consists of discrete elements; and (d) the need to attend to and discern the linguistic unit targeted by the metalinguistic task. Discrepancies between normal and disordered children on any one of these factors could have contributed to the poorer syntactic judgment abilities of the disordered children. It is also possible that the different syntactic judgment abilities of the two groups simply reflected the fact that the language-disordered children could not produce the targeted syntactic structures with the same proficiency as the normal children. Below, some speculations are offered concerning the relative contribution of each of these factors to the inferior syntactic judgment performance of the language-disordered children.

There is some evidence that factors *b* and *c* had less influence on the syntactic judgment abilities of the disordered children than factors *a* and *d*. The finding that the two groups showed similar abilities in identifying and correcting semantic and phonologic errors indicates that these children were able to judge at least certain linguistic elements out of their normal communicative contexts. It seems unlikely, therefore, that it was the lack of context that caused the disordered children's poor syntactic judgment performance. It was also unlikely that the normal children had more knowledge about discrete linguistic elements than the disordered children. If anything, through their therapy experiences, the language-disordered children probably had more formal training on discrete linguistic elements than the normal

children. Note that the normal children were too young to have received any formal reading instruction.

More likely is that the language-disordered children had difficulty discerning, attending to, and accessing syntactic information. There are several reasons why the language-disordered children might have had such difficulty. First, these children might have insufficient knowledge of the syntactic forms targeted by the metalinguistic task. Second, these children might have less well-established and stable representatives of syntactic forms because they have acquired knowledge and control of these forms later than normal children. Finally, the language-disordered children might use less efficient strategies for retrieving linguistic information.

It seems likely that each of these factors contributed in some way to the language-disordered children's inferior metalinguistic performance. Thus, not only do language-disordered children take longer to understand and produce various linguistic forms, but they also take longer to access this knowledge once it is acquired. This helps explain why language-disordered children have difficulty with certain metalinguistic tasks as well as why many of these children continue to have learning difficulties well after they no longer suffer from a primary linguistic deficit.

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Appendix

Test of Metalinguistic Abilities

Examples
1. Eat the cake_____
2. She is singing rope._____
3. Tomorrow he go on a ride._____
4. This isn't Mary's doll._____
5. The cat run play the street._____

Sentence Stimuli
1. Jill eats cards. (SEM)_____
2. Usually he lalks to school. (PH)_____
3. He has four shirts. (OK)_____
4. He doesn't want to be sunny today. (SEM)_____
5. Yesterday he play ball. (SYN)_____
6. They throwing the stick. (SYN)_____
7. Where is the poat? (PH)_____
8. He often rides his bike. (OK)_____
9. John has two tig cars. (PH)_____
10. Where did you know the answer? (SEM)_____
11. He not want to play today. (SYN)_____
12. She knocked the bottle over yesterday. (OK)_____
13. Where the coat is? (SYN)_____
14. She doesn't want to go to school today. (OK)_____
15. Usually he walk to school. (SYN)_____

16. John's hat *is on* his foot. (SEM)_____
17. He doesn't want to tum today. (PH)_____
(t/k—come)
18. John has two book. (SYN)_____
19. Jane's book is on the floor. (OK)_____
20. Yesterday he played table. (SEM)_____
21. Jill ate three milks. (SEM)_____
22. Where is the ball? (OK)_____
23. Yesterday he taw a movie. (PH)_____
(t/x—saw)
24. Usually he eats to school. (SEM)_____
25. Susan's dicycle is broken. (PH)_____
26. They're eating hamburgers. (OK)_____
27. Leroy bicycle is in the garage. (SYN)_____
28. They're welling a story. (PH)_____