Journal of Speech and Hearing Disorders, Volume 55, 533–541, August 1990

LINGUISTIC HUMOR COMPREHENSION OF NORMAL AND LANGUAGE-IMPAIRED ADOLESCENTS

CECILE C. SPECTOR
Long Island University—Rockland Campus, Orangeburg, NY

The purpose of this study was to compare the ability of normally achieving and language-impaired adolescents to comprehend linguistic humor in a decontextualized situation. A classification scheme was used to describe 10 elements of linguistic humor. Riddles, jokes, and puns used as stimulus materials were classified and placed into one of the 10 linguistic categories. The categories were arranged according to the lexical, phonological, morphological, or syntactic element on which each humor item could be based. The two groups of subjects were 12 normally achieving and 12 language-impaired high school students from Grades 9–12. As expected, the language-impaired group had significantly poorer comprehension of the humor elements than the normally achieving group. Especially poor were their ability to grasp the nature of multimeaning words and their ability to segment and redefine phonological strings. The use of this classification scheme for developing strategies for assessment and intervention activities that involve linguistic-based humor is discussed.

KEY WORDS: humor comprehension, linguistic humor elements, language-impaired adolescents

Research has shown that parallels exist between children's development of humor and their development of cognitive, linguistic, and metalinguistic skills (Fowles & Glanz, 1977; Kagan, 1967; Lund & Duchan, 1983; McGhee, 1971, 1974; Shultz & Horibe, 1974). However, what little is known about the comprehension of linguistic humor does not encompass adolescents in general and adolescents with language disorders in particular (Bernstein, 1986; Wiig, 1984). Given that an examination of linguistic humor comprehension involves analysis of language as an object, the resulting data would expand our knowledge of metalinguistic awareness for this population.

Many language-impaired children experience difficulty comprehending puns and riddles because of the sophisticated level of language knowledge required (Kamhi, 1987). And although the difficulties encountered by language-impaired children in processing phonological, syntactic, and semantic information have been discussed (Kamhi & Catts, 1986), there is little information about the processing abilities of adolescents with regard to humor comprehension.

Academic Difficulties

In the academic setting, particularly in language arts and English, the ability to comprehend multimeaning words and phrases and ambiguous or figurative expressions is important to school achievement. Figurative language occurs frequently in the language of instruction as well as in conversational speech (Hoffman & Hoveck, 1980). In the course of conversation or instruction, it is common for humorous remarks based on figurative language to be made. Consider the items that follow. They are humorous only if both literal and nonliteral interpretations are discerned: "A sculptor friend of mine celebrated his birthday and everyone chipped in for a gift." Or, "In 1920 the branding iron was invented. The cattle were really impressed."

Although many of the difficulties with the literal aspects of language generally have diminished by the adolescent years, language-impaired students in this age group still find nonliteral meanings hard to understand (Blue, 1981; Donahue & Bryan, 1984; Nippold, 1985; Wiig & Semel, 1984). Blue, for example, specified five types of utterances (sarcasm, idiomatic expressions, ambiguous statements, indirect requests, and words with multiple meanings) that should be avoided when speaking to language-impaired students because frequently they are taken in the literal sense. Such utterances, Blue noted, "are so much a part of the adult's verbal repertoire that the user tends to be unaware of the confusion that may result for the unsophisticated listener" (p. 120).

Social Difficulties

According to Donahue and Bryan (1984), communication problems that persist into adolescence appear to have increasingly negative consequences. During this phase of development, appropriate verbal interaction with one's peers is important for group acceptance. Part of this verbal interaction is the understanding of riddles, jokes, and puns. Donahue, Pearl, and Bryan (1982) and Blalock (1982) indicate that deficits in acquiring vocabulary and syntactic and semantic structures impede language-impaired adolescents' ability to use or comprehend slang, idioms, jokes, puns, and sarcastic comments. The difficulty encountered in understanding humorous exchanges based on interpretation of figurative expressions could, as Wiig (1984) suggests, adversely affect relations with siblings, parents, peers, and prospective employers.

As these studies have indicated, difficulty in comprehending verbal humor can be problematic for the adoles-

© 1990, American Speech-Language-Hearing Association

0022-4677/90/5503-0533$01.00/0

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

cent. It may be that, by determining which linguistic humor elements are understood and which are not, the nature of the skills required for improving humor comprehension can be discerned.

Therefore, the purposes of this study were to explore the ability of normally achieving and language-impaired adolescents to comprehend linguistic humor, and to group linguistic humor items into categories, based on their particular element of humor, in order to examine element-specific comprehension among both normally achieving and language-impaired adolescents.

Examining the Elements of Linguistic Humor

Within categories of linguistic humor identified in the literature, subcategories can be identified (Fowles & Glanz, 1977; Green & Pepicello, 1978; Hirsch-Pasak, Gleitman, & Gleitman, 1978; Pepicello, 1980; Shultz, 1974; Shultz & Horibe, 1974; Shultz & Pilon, 1973). For example, the classifications developed by Green and Pepicello (1978) and Pepicello (1980) include groups of what they describe as "linguistic strategies." These strategies all involve creating "block elements." The block element is that element that impedes the perception of the ambiguity that is present in a humorous item. Block elements also have been defined by George and Dundes (1963), in their description of riddles, as internal contradictions. Hamnett (1967) pointed out that in riddling, an ambiguous word or element (the block) can be seen as belonging to two or more frames of reference, according to the interpretation forced on it. Most of the elements involve grammatical ambiguity, where "words or phrases have more than one underlying semantic structure, but are identical in surface form as a result of processes at the phonological, morphological, or syntactic levels of grammar" (Pepicello & Weisberg, 1983, p. 65). Ten linguistic elements were delineated by Green and Pepicello (1978) and Pepicello (1980). These elements were arranged according to their phonological, morphological, or syntactic classification, as follows:

I. Phonological items based on:
   1. lexical items
   2. minimal pairs
   3. metathesis
   4. stress/juncture

II. Morphological items based on:
   1. irregular morphology
   2. morphological analysis
   3. exploitation of bound morphemes
   4. pseudomorphology

III. Syntactic items based on:
   1. phrase structure
   2. transformational ambiguity

Phonological Elements

Phonological elements generate humor derived from the following:

1. *Lexical items,* where the humor is based on the ambiguity of a word. For example, "The first horse motel was opened to provide animals with a *stable* environment." The word *stable* is used in this first example to mean a building that houses animals, or steady and secure. Another example is, "A famous sardine factory *canned* all its employees." The word *canned* is, of course, the ambiguous term.

2. *Minimal pairs,* where the element involves the difference of one phoneme. For example, "Men's briefs are manufactured in the West Undies." The phoneme change of Indies to *Undies,* relating to men's briefs, is the source of humor. Or, in this example, "The first whitener for clothes was used in Miami *Bleach,*" the addition of the phoneme /l/ is the difference on which the humor hinges.

3. *Metathesis,* where sound reversal is the element employed. For example, "A knife that cuts four loaves of bread at the same time could be advertised as a *four loaf cleaver.*" Of course this is a play upon *four leaf clover.* Or, metathesis also can involve word reversals, such as, "Nasal spray salesman—a guy who goes around *sticking his business into other people's noses*" instead of *sticking his nose into other people's business.*

4. *Stress/juncture,* where the placement of stress changes the meaning, as in "The person who replaced the bulbs atop the John Hancock Building (Boston's tallest building), said it was the *highlight* of his career." The placement of stress in *highlight* can mean the highest light bulb or the great moment of his career. A second example of stress/juncture would be, "Two weevils started life together. One was an immediate success, the other a complete failure. Naturally, it became known as *the lesser of two weevils.*" A change of stress would reveal the expression *the lesser of two evils.*

Morphological Elements

Humor based on morphological elements includes:

1. *Irregular morphology,* where the humorous element involves exploiting a misinterpretation of a grammatical form, as shown by this item: Customer—"I'd like a can of talcum powder, please." Storekeeper—"Would you like it scented?" Customer—"No, thanks. I'll just take it with me." The word *scented,* meaning having an aroma, is intentionally confused with *sent* or *delivered.* Another example is: As Noah remarked while the animals were boarding the Ark, "Now I herd everything!" The humor lies in the use of *I herd* for *I've heard.*

2. *Morphological analysis,* where one morpheme is extracted from a word and treated as if it were an independent word with which it is homophonous. For example, "What do frogs sit on at mealtime?" "Toad*stools.*" Or, in this second example, "What do you call a person who loves hot chocolate?" "*Coco*nut."

3. *Exploitation of bound morphemes,* where a bound morpheme is deliberately confused with an independent word or otherwise exploited. For example, "A drama critic summed up his reaction to the opening of a Broadway play by saying, 'I was *under*whelmed.' " Or, "He was

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

so inept that he couldn't hit the nails on the head, so we sent for an *ept* workman." In this second example, the removal of a bound morpheme results in a nonword.

4. *Pseudomorphology,* where an independent word is deliberately confused with a phonological sequence from another, larger word, but the sequence is not really a morpheme of the larger word. For example, "What is the *key* to a good dinner?" "A tur*key.*" Another example would be, "Where do pencils come from?" "*Pennsyl*vania."

Syntactic Elements

Syntactic elements generate humor based on:

1. *Phrase structure,* where a given surface sequence of words has more than one syntactic analysis. The literal interpretation of phrases meant to be taken in the abstract sense, such as idioms, often is seen in the phrase structure element. For example, "When the first credit card was issued, people *got a charge out of it.*" This can be interpreted as *enjoyed* the card, or used it as a *medium of exchange.* A second example would be, "When the first automatic packaging machine was invented the inventor *made a bundle.*" There is an attempt to deliberately confuse the idiom *made a bundle,* or *made a lot of money,* with its literal counterpart, *bundle* meaning *package.*

2. *Transformational ambiguity,* where two different underlying structures have an identical surface form as a result of their respective syntactic derivations. For example, transformational ambiguity can be seen in "Did you hear about the cannibal who wanted to stop where they *serve truck drivers?*" This item can be interpreted as going to a place where truck drivers are served, or being served truck drivers for one's meal. A final example of this element would be, "I can lift an elephant with one hand." "Really?" "Sure. Get me an elephant with one hand and I'll show you." The ambiguity is found in the phrase *with one hand.* In one interpretation the speaker is a very strong individual, in the other, the elephant has one hand.

Other researchers have delineated linguistic classifications in a different manner. For example, items that Fowles and Glanz (1977) had grouped together under the category of *surface ambiguity* would fall into the following element categories in the Green and Pepicello (1978) paradigm: "What happened to the man who fell from a ten story building?" "Nothing, he had on his light fall suit." *Stress/juncture* would be considered the humor element underlying this item. A second example would be, "What room can no one enter?" "A mushroom." This item uses *morphological analysis* as its humor base. Still another example of Fowles and Glanz's surface ambiguity items would be, "What has four wheels and flies?" "A garbage truck." According to Green and Pepicello this riddle is based on *transformational ambiguity.* Some of Fowles and Glanz's riddles did not involve grammatical elements at all. For example, "What animal can jump higher than a house?" "All animals, houses can't jump." This type of riddle is based on presupposition underlying the question, rather than a grammatical element. Another example of an item with a nongrammatical base would be, "How do you get six elephants into a VW?" "Three in front, and three in back." This is a riddle parody. The answer has to be learned by rote and cannot be discerned from the question. Items such as these were included in Fowles and Glanz's analyses of data even though they are not based on linguistic elements. Differences in categorizing also were seen in Hirsch-Pasak et al. (1978). For example, they classified the following item as morphological: "Do you think that if I wash, my face will be clean?" "Let's soap for the best." The humorous element (let's soap/let's hope) depends on stress/juncture and would be described by Green and Pepicello as phonological. One final example is taken from Hirsch-Pasek et al. (1978), where "He saw a man eating fish" was classified as having surface structure ambiguity. Classifying this item as transformationally ambiguous seems more appropriate.

Measuring Humor Comprehension

Humor studies have used different modes of presenting stimulus materials. For example, Shultz and Pilon (1973) distinguished between the effects of visual versus auditory presentation with the following examples: "He saw three pears (pairs)," and, "He goes to the bank." Both items have an ambiguous element if presented auditorily, but only the second item would be ambiguous in a visual presentation as well. Presentation format also can affect responses. For example, measuring comprehension based on explanations as a response mode would place a greater burden on the subject than would picture matching or multiple choice (Gallagher & Wright, 1979; Goldman, Pelligrino, Parseghian, & Sallis, 1982). Nippold, Martin, and Erskine (1988) also noted that the use of a format that requires explanations may tend to underestimate comprehension.

Given that other researchers used different methods to classify linguistic humor items and different formats for presenting their stimuli, it is difficult to compare data from one study to another.

Because the classification system developed by Green and Pepicello (1978) and Pepicello (1980) appears to be the most complete and well-organized method of delineating linguistic elements, it was used, with one modification, to analyze the responses of the subjects in this study. Of the 10 linguistic categories delineated by Green and Pepicello (1978) and Pepicello (1980), 9 appear to be appropriately placed according to their phonological, morphological, or syntactic classification. Only 1, "lexical items," appears misplaced when considered to belong to the phonological group. Other items in this group depend on manipulation at the phonological level of grammar; the lexical items do not. Because the lexical items do not appear to fit into the morphological or syntactic groups either, they should be considered separately. Therefore, for this study, Green and Pepicello's classification was modified by placing *lexical items* into a separate category.

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

METHOD

Subjects

Two groups of public high school students in Grades 9–12 were selected. The students were from a middle socioeconomic status community in upstate New York. The first group contained 12 students, 8 males and 4 females. Their mean age was 16 years 3 months, with a range from 14 years 4 months to 19 years 2 months. Before entering high school, these students had been diagnosed as having impaired language by speech-language pathologists in their previous school settings. They were classified as language impaired (LI) by their school district's Committee on the Handicapped. All students in this group were enrolled in the high school speech-language therapy program at the time this study was conducted. A certified speech-language pathologist in the high school administered a battery of tests to confirm the diagnoses. That battery included an analysis of spontaneous language, the Peabody Picture Vocabulary Test—Revised (Dunn & Dunn, 1981), and the Clinical Evaluation of Language Fundamentals—Revised (Semel, Wiig, & Secord, 1987). The second group contained 12 students who were randomly selected from those considered by their teachers to have normal language (NL) abilities. There were 7 males and 5 females. The mean age of this group was 16 years 4 months, with a range from 14 years 1 month to 18 years, 1 month. When given the same language test battery used to assess the students in the language-impaired group, these students were, indeed, found to be in the normal range of development.

Spontaneous language was examined by the speech-language pathologist in both clinical and classroom settings. Students in the LI group were noted, by their teachers and the speech-language pathologist, to be less capable than their normally achieving peers in skills such as using age-appropriate morphological and syntactic structures, using age-appropriate vocabulary, giving or following directions, asking or answering questions, and using language to communicate ideas effectively. The expressive and receptive abilities of the students in the NL group were judged, by their teachers and the speech-language pathologist, to be within the average range when their spontaneous language was analyzed.

Standard scores for the LI group on the Peabody Picture Vocabulary Test ranged from 71 to 91 (M = 80.67; SD = 6.32). The NL group's standard scores ranged from 88 to 121 (M = 105.92; SD = 3.45). Scores for the LI group on the Clinical Evaluation of Language Fundamentals—Revised (CELF—R) ranged from 69 to 84 (M = 77.58; SD = 4.89). The scores for this group were between one and two standard deviations below the CELF—R mean. However, it should be noted that, according to the CELF—R test manual (Semel, Wiig, & Secord, 1987), when a total language score is below 85 (one standard deviation below the mean) individual subtest scores should be examined to see if the total score is a true representation of overall performance. For each of 3 students, it was found that a high score in one subtest inflated the mean for all subtests. It is probable, therefore, that for these 3 students (LI Subjects 1, 5, and 10 in Table 1), the total language score is an overestimation of abilities. CELF—R scores for the NL group ranged from 97 to 128 (M = 109.83; SD = 6.18). Table 1 shows scores for both groups on the PPVT—R and the CELF—R. Determination of language impairment was based on the combined results of all measures in the assessment battery.

All students in both groups spoke English as their native language, and they all had normal hearing and vision according to the school nurse's records. All of the students scored within the average range of intelligence on the WISC—R, which was administered by the school psychologist. The LI group had a mean IQ of 98 (range = 85–117; SD = 11.42). The NL group had a mean IQ of 106 (range = 88–120; SD = 9.95).

Classification of Stimulus Items

Humorous material was taken from instructional handbooks for adolescents, as well as a variety of books of riddles, jokes, and puns. All stimulus items were classified according to their linguistic element. This was accomplished by giving an identical array of almost 200 humor items to each of three speech-language pathologists (one, the author) for sorting.

Following the classification system devised by Green and Pepicello (1978) and Pepicello (1980), each item was placed in 1 of the 10 categories of linguistic elements or discarded. Primarily, items were discarded when all three sorters did not agree unanimously on the placement of an item in one of the 10 elements. However, items also were discarded if they appeared to be inappropriate for adolescents (too childish or too adult), if they used obscure language, or if they had unusual vocabulary. Finally, humor involving ethnic jokes or parodies, where the question-answer sequence involved a setup and a punch line that is learned by rote, also were not included.

TABLE 1. Standard scores for language-impaired (LI) and normal language (NL) groups on the PPVT—R and CELF—R.

	LI		*NL*	
Subject	*PPVT—R*	*CELF—R*	*PPVT—R*	*CELF—R*
1	71	84	88	99
2	76	77	90	101
3	72	83	105	97
4	80	79	113	110
5	85	81	94	106
6	79	69	119	105
7	78	75	99	104
8	87	77	102	115
9	85	72	115	128
10	79	83	117	113
11	91	80	121	123
12	85	71	108	117

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

The elements, as previously described, were divided into four major categories: lexical items, which stood as a unique element type; phonological; morphological; or syntactic. Phonological elements included minimal pairs, metathesis, and stress/juncture. Morphological elements included irregular morphology, morphological analysis, exploitation of bound morphemes, and pseudomorphology. The syntactic elements were phrase structure and transformational ambiguity.

Because proper grouping was a key element for this study, only the 87 items that all three sorters selected as being appropriate to a particular category were used. It must be noted that although extreme care was taken to select items that would result in mutually exclusive categories, there may appear to be some overlap between the lexical and the phrase structure items. Even though all items in these categories were selected and agreed upon by all three sorters for this study, they are particularly vulnerable to alternate interpretation.

Data Collection

Each riddle, joke, and pun was presented in written form *and* read aloud, to each subject individually, by the author. Each subject was seen for one session. Typically, each session lasted from 45 to 60 min. In this amount of time the subjects were able to respond to the 87 items presented to them. The items were presented in random order, without regard for category. Responses were audiotaped in a quiet room for analysis at a later time.

The nature of the different elements suggested different presentation formats. Declarative statements or simple question/answer formats were used for minimal pairs, metathesis, stress/juncture, irregular morphology, exploitation of bound morphemes, phrase structure, and transformational ambiguities. For example, this item in the minimal pair element uses a declarative statement: "The first dog obedience school had a large barking lot." A question/answer format is seen in this item from the exploitation of bound morphemes element: "What kind of ears does a train have? Engineers." A multiple-choice format was used for morphologically analyzed and pseudomorphological items. For example, multiple choice is seen in this pseudomorphological item: "Which pet makes the best music?' (a) trumpet; (b) kitten; (c) turtle. For lexical items, both declarative statement and multiple-choice formats were used. For example, "The president of the tailor's union held a press conference," and "Why can't your nose be 12 inches long?"

1. "Because then no one would like you."
2. "Because then it would be a foot."
3. "Because noses don't grow that long."

The format used in any of the 10 categories was determined, to a great extent, by the format used in the remedial texts and other source materials from which the humor items were taken. Although alternate formats are certainly possible for some of the elements, the formats used in this study were typical of the item formats presented in the source materials.

Data Analysis

In order to consider a student's response as correct, two criteria had to be met. The first required that the student pinpoint the source of the ambiguity. This could be accomplished by mentioning that a word or phrase was being used in an ambiguous or unexpected manner, that a word had more than one meaning, or that an idiom was being taken in the literal sense. The second criterion required that the student had to explain the two meanings that could be derived from the ambiguity. Student responses were compared to the protocol of acceptable responses developed for each item by the speech-language pathologists who selected the humor items. For instance, for the item "My electrician usually worries about current events," the student was required to select:

1. ambiguous term(s)—*current events*
2. dual explanations which include the following:
   a. "current events" can mean what is happening in the world, news on television, newspapers, and so forth and
   b. "current events" has to do with electrical power, getting a shock, voltage, and so forth.

The following examples are typical explanations given by students who "got it."

Item: "Cosmetologist Jack Smith gives his students make-up exams." Response: "Oh, that's supposed to be funny because you can take *make-up* two ways. Like someone who works with make-up and tests you on how you put on eye shadow, blush, and that kind of stuff, or, it can mean taking a test over again." Item: "On a music store window: "Come in, pick out a drum, then beat it!" Response: "When they say *beat it*, it can mean beat the drum, like bang on it, or it can mean get out of here, get lost!"

According to the acceptable responses protocol, the selection of the word *make-up* in the first example and the phrase *beat it* in the second fulfills the first criterion of finding the source of the ambiguity. The explanation of the two ways in which the ambiguous term or phrase can be interpreted fulfills the second.

RESULTS

To examine the statistical significance of the results of comparisons between the language-impaired and normal language groups, independent t tests were performed. These tests showed that for all four elements—lexical, phonological, morphological, and syntactic—the language-impaired students scored significantly poorer than the students with normal development. For lexical items, $t(22) = 6.36$, $p < .001$; for phonological elements, $t(22) = 8.87$, $p < .001$; for morphological elements, $t(22) = 7.50$, $p < .001$; and for syntactic elements, $t(22) = 6.99$, $p < .001$.

Comparisons also were made between the language-impaired and normally achieving students for each category within the groups of lexical items and phonological,

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

morphological, and syntactic elements. As shown in Table 2, in all but one comparison in the morphological group, pseudomorphological ($t(22) = 0.24$, $p > .05$), the impaired group scores were significantly lower than those of the normal group. The differences were significant at the .001 level of confidence.

Within-group differences based on sex or chronological age also were examined. There were 4 females and 8 males in the LI group and 5 females and 7 males in the NL group. Differences between the number of errors of females and males were not significant in either group: LI, $t(11) = 1.05$, $p > .05$; NL, $t(11) = 0.43$, $p > .05$. Spearman rank order correlations were used to determine whether age was a significant factor in number of errors produced. The LI group ranged from 14 years 4 months to 19 years 2 months. The mean age was 16 years 3 months. The NL group ranged from 14 years 1 month to 18 years 1 month. The mean age was 16 years 4 months. When the significance of the correlations for the LI group (*rho* = −.01) and the NL group (*rho* = −.19) was tested, no significant error differences were found: LI, $t(22) = 0.009$, $p > .05$; NL, $t(22) = 0.61$, $p > .05$.

The process of selecting linguistic humor items was somewhat constrained by the availability of appropriate materials. An extensive search yielded a preponderance of materials for elements such as lexical items, minimal pairs, stress/juncture, and phrase structure ambiguities, whereas other elements were not as well represented. Also, as previously stated, many items were discarded because they used obscure language or unusual vocabulary, were in poor taste, or contained material inappropriate for adolescents. Therefore, each linguistic element is not represented by an equal number of items.

Because of the unequal numbers, and because the nature of the element types required more than one response mode, within-group comparisons had to be of a descriptive, rather than a statistical nature. Table 3 displays the mean number of errors, standard deviations, and ranges for the LI and NL groups for each linguistic element.

The most striking differences in mean number of errors were for stress/juncture items (LI group $M = 8.92$, NL group $M = 2.75$), and lexical items (LI group $M = 7.08$, NL group $M = 1.50$). For the pseudomorphological items, error difference between the groups was minimal (LI group $M = 0.92$, NL group $M = 0.83$).

TABLE 2. Comparisons between language-impaired and normal language groups for each category within the groups of lexical items and phonological, morphological, and syntactic elements.

Element	*Results*
Lexical items	t=6.36, p<.001
Phonological	
Minimal pairs	t=4.48, p<.001
Metathesis	t=5.79, p<.001
Stress/juncture	t=8.38, p<.001
Morphological	
Irregular morphology	t=6.46, p<.001
Morphological analysis	t=4.92, p<.001
Exploitation of bound morphemes	t=6.22, p<.001
Pseudomorphological	t=0.24, p<.05
Syntactic	
Phrase structure	t=5.92, p<.001
Transformational ambiguity	t=6.54, p<.001

TABLE 3. Mean number of errors, standard deviations, and ranges for language-impaired (LI) and normal language (NL) groups for each linguistic element.

Element	# *of items*	*LI group*			*NL group*		
		M	*SD*	*Range*	*M*	*SD*	*Range*
Lexical items	(12)	7.08	2.54	4–12	1.50	1.73	0–6
Phonological							
Minimal pairs	(12)	4.67	3.32	2–9	1.50	1.17	0–4
Metathesis	(9)	5.33	1.37	4–8	2.16	1.34	1–5
Stress/juncture	(12)	8.92	1.98	6–12	2.75	1.66	0–5
Morphological							
Irregular morph.	(5)	3.42	1.08	2–5	1.00	0.74	0–1
Morph. analyzed	(9)	3.00	1.28	1–5	0.75	0.97	0–3
Exploit. of bound morphemes	(4)	3.00	0.60	2–4	1.17	0.84	0–2
Pseudomorph.	(5)	0.92	1.00	0–3	0.83	0.72	0–2
Syntactic							
Phrase structure	(12)	7.42	2.58	3–11	2.08	1.83	0–6
Transformational	(7)	5.17	1.27	3–7	2.00	1.13	1–4

DISCUSSION

An analysis of verbal humor, through an exploration of specific linguistic elements, showed the comprehension of language-impaired adolescents to be significantly poorer than that of their peers with normal language development. The ability to select the humorous element and explain why it is funny was, as expected, far more difficult for the impaired students than for those with normal language skills. Most of the normally achieving students were able to pinpoint the humorous element involved with relative ease. For example, in analyzing the lexical item, "The waffle iron was invented for people who had wrinkled waffles," the following response was typical of the normal language students: "They're using *iron* in two ways, like to press the wrinkles out of something, or *waffle iron*, an appliance that makes waffles."

The language-impaired students had difficulty locating the source of the ambiguity, and, if they did, they could not adequately explain the dual meanings.

The one linguistic element that was relatively easy for both groups was pseudomorphological. By their very nature, the pseudomorphological items do not pose the type of ambiguity that is present for the other elements. There is merely the deliberate confusion of an independent word with a phonological sequence, taken from another word. For example, *key* is not a morpheme of *turkey*. Another possibility is that the format, where one of three responses could be selected by process of elimination, made the correct response visually more salient.

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

In fact, in the lexical category, there were 3 of the 12 items that also had the multiple-choice format. Although there was still a considerable difference between the groups for those three items (.39 errors for the LI group and .06 errors for the NL group), the proportion of errors for each group was even greater for the nine lexical items that did not have the multiple-choice format (.66 errors for the LI group and .16 errors for the NL group). The only other element type with a multiple-choice response format was morphological analysis. In this case, the difference between the groups was significant. Perhaps the difference would have been even greater if multiple choice were not used. As Nippold, Martin, and Erskine (1988) suggested, the use of response modes that require explanations, rather than offering multiple choices, makes it more difficult for students to demonstrate their comprehension. Unfortunately, many humor items do not lend themselves to a multiple choice format.

The importance of context upon humor comprehension also should be considered. The items in this study were presented in a decontextualized situation. If, for example, the items examined were within the context of spontaneous conversation between peers, differences in the level of comprehension may have been noted. Although it is beyond the scope of this study to explore this issue in depth, it is interesting to reflect upon whether a spontaneous language context would hamper or help students to grasp humorous items. In a spontaneous language context, the items would be embedded in a complex and often rapid flow of language (Berlin, Blank, & Rose, 1980), allowing students little time to focus on the items or to consider their ambiguous nature. On the other hand, a spontaneous language context offers facial, gestural, intonational, and situational cues that may help to get the meaning of the items across (Wallach & Lee, 1980).

The language-impaired students in this study appeared to have difficulty analyzing language into linguistic units. For example, in order to grasp the ambiguity in stress/juncture items it is necessary to segment and redefine a phonological string without the support of underlying meaning. Consider the following: "Knock, knock." "Who's there?" "Doris." "Doris who?" "Doris closed. That's why I knocked." The word *Doris* has to be resegmented into *door is* in order to discern the appropriate interpretation. The language-impaired students appeared to lack this skill for the items presented. In fact, as previously stated, the error difference between the groups was greatest for the phonological element stress/juncture. Although in the verbal presentation of the items special care was taken to give similar stress to each syllable in the ambiguous word, it is likely that the visual segmentation of words like *highlight* as opposed to *high light* or *selfish* as opposed to *sell fish* affected the language-impaired group's comprehension by supporting a particular interpretation. However, this segmentation did not affect the comprehension of the normally achieving group. This finding supports Hirsch-Pasek et. al. (1978), who argued that riddles that involve the aspects of language most concerned with meaning are easier to grasp than those that involve surface properties such as stress/juncture. This can be shown by the ability of children to segment a sentence into words much earlier than they can segment words into syllables (Kamhi, Lee, & Nelson, 1985). The former depends on meaning, the latter does not.

Recognizing the difference between literal and figurative meanings in words is required to understand many humor items. Being able to evoke new or different meanings taps an individual's metalinguistic abilities (Kahmi, 1987; van Kleeck, 1984). Humor in the lexical items category, for example, is based on the ambiguity of a word. That category proved to be difficult for the language-impaired adolescents. Other researchers (Lee & Kamhi, 1985; Nippold & Fey, 1983) also noted the difficulty language-impaired children have in grasping the difference between literal and figurative speech. The language-impaired group's difficulty in treating language metalinguistically, as an object of analysis and observation, was readily apparent in items such as "What animal doesn't play fairly?" (skunk, pig, *cheetah*), "What is the life story of a car called?" (bibliography, *auto*biography, assembly line), or "Why aren't fishermen generous?" ("Their business makes them *selfish*.")

Much of the language in the humor items was figurative. Difficulty was caused by such expressions as "the lesser of two evils," "strike while the iron is hot," "get a charge out of it," or "beat it!" As mentioned in the literature review, similar findings have been noted by other researchers (Blue, 1981; Donahue & Bryan, 1984; Seidenberg & Bernstein, 1986; Wiig & Semel, 1984) who report the difficulty language-impaired students have in comprehending figurative language. The impaired group's difficulty in discerning abstract meanings appeared to prevent those students from appreciating many humorous elements.

The fact that skills such as those required for segmentation or for distinguishing between literal and nonliteral meanings appear to be deficient at this stage of the language-impaired adolescents' development indicates that a need still exists for developing awareness of specific aspects of language.

The research literature on learning-disabled adolescents indicates that such students fail to make effective use of their cognitive resources. They do not know how or when to use task-specific cognitive strategies (Brown, 1980; Seidenberg & Bernstein, 1986; Wong, 1987). However, when such adolescents are taught a task-specific cognitive strategy, many have shown that they can make effective use of the strategy (Gelzheiser, 1984; Wong & Jones, 1982). Studies by Brown and Palincsar (1982), Gelzheiser (1984), and Wong and Jones (1984) have shown that verbal processing and metacognitive strategies can be taught to assist language-impaired students in meeting the communicative demands placed upon them. The goal of the learning strategies approach is to teach the adolescent *how* to learn rather than *what* to learn (Schumaker & Deshler, 1984). Appropriate strategies can be developed if skills that are weak and require attention are brought to light. For example, determining which

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

linguistic humor elements are understood and which are not could help to clarify which strategies are needed to help students grasp the nature of multimeaning words or phrases (the source of ambiguity in the lexical and phrase structure items), or to develop awareness of the need to redefine a phonological string (the source of ambiguity in the stress/juncture items).

Using metacognition research as her base, Seidenberg (1988) has identified the features necessary for developing intervention for tasks that require the acquisition and use of cognitive strategies. Some of those features are: improving the student's awareness of the task demands, finding the relevant strategy, describing the strategy, modeling the strategy, and applying the strategy in controlled practice materials. Wiig and Semel (1984) also have delineated strategies for dealing with deficits in linguistic understanding.

Interestingly, even students from the normal language group had difficulty with some items. The percentage of correct responses for the 10 different linguistic strategies ranged from 71% to 92%. Nippold et al. (1988), in examining proverb comprehension, also found that the ability to comprehend abstract, figurative language was not completely mastered by their normal adolescent subjects.

Much of the humorous material examined in this study appears to require an adult frame of reference. It is probable, therefore, that the ability to understand and appreciate humor continues into the adult years.

The findings of this study suggest that examining humor comprehension, using the classification system described herein, would be useful in identifying those areas requiring attention. Using an approach that helps to develop cognitive strategies seems appropriate for addressing linguistic problems such as those exhibited by the language-impaired adolescents in this study.

These findings should be verified by further research using a greater number of subjects, a greater number of items in each linguistic category, and an in-depth exploration of the extent to which comprehension of humorous items is affected by differing presentation formats. Future research could focus on the effectiveness of intervention for deficits in linguistic-based humor using a cognitive strategies approach.

ACKNOWLEDGMENT

I am grateful to Harriet B. Klein, Nelson Moses, Nichola W. Nelson, Marilyn A. Nippold, and Geraldine P. Wallach for their valuable suggestions on an earlier version of this manuscript and to Mort Spector for his assistance in gathering humor materials.

REFERENCES

BERLIN, L. J., BLANK, M., & ROSE, S. A. (1980). The language of instruction: The hidden complexities. *Topics in Language Disorders, 1,* 47–58.

BERNSTEIN, D. K. (1986). The development of humor: Implications for assessment and intervention. *Topics in Language Disorders, 6,* 65–71.

BLALOCK J. (1982). Persistent auditory language deficits in adults with learning disabilities. *Journal of Learning Disabilities, 15,* 604–609.

BLUE, C. M. (1981). Types of utterances to avoid when speaking to language delayed children. *Language, Speech, and Hearing Services in Schools, 12,* 120–124.

BROWN, A. L. (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 453–481). Hillsdale, NJ: Erlbaum.

BROWN, A. L., & PALINSCAR, A. S. (1982). *Inducing strategic learning from texts by means of informed, self-control training* (Tech. Rep. No. 262). Urbana: University of Illinois Center for Study of Reading.

DONAHUE, M., & BRYAN, T. (1984). Communicative skills and peer relations of learning disabled adolescents. *Topics in Language Disorders, 4,* 10–21.

DONAHUE, M., PEARL, R., & BRYAN, T. (1982). Learning disabled children's syntactic proficiency during a communicative task. *Journal of Speech and Hearing Disorders, 47,* 397–403.

DUNN, L. M., & DUNN, L. M. (1981). *Peabody Picture Vocabulary Test—Revised.* Circle Pines, MN: American Guidance Service.

FOWLES, B., & GLANZ, M. E. (1977). Competence and talent in verbal riddle comprehension. *Journal of Child Language, 4,* 433–452.

GALLAGHER, J. M., & WRIGHT, R. J. (1979). Piaget and the study of analogy: Structural analysis of items. In M. K. Poulsen & G. I. Lubin (Eds.), *Piagetian theory and the helping professions: Proceedings from the eighth interdisciplinary conference* (Vol. 2, pp. 100–104). Los Angeles: University of Southern California.

GELZHEISER, L. M. (1984). Generalization from categorical memory tasks to prose by learning disabled adolescents. *Journal of Educational Psychology, 76,* 1126–1138.

GEORGES, R. A., & DUNDES, A. (1963). Toward a structural definition of the riddle. *Journal of American Folklore, 76,* 111–118.

GOLDMAN, S. R., PELLEGRINO, J. W., PARSEGHIAN, P., & SALLIS, R. (1982). Developmental and individual differences in verbal analogical reasoning. *Child Development, 53,* 550–559.

GREEN, T. A., & PEPICELLO, W. J. (1978). Wit in riddling: A linguistic perspective. *Genre, 11,* 1–13.

HAMNETT, I. (1967). Ambiguity, classification and change: The function of riddles. *Man, 2,* 379–393.

HIRSCH-PASEK, K., GLEITMAN, L. R., & GLEITMAN, H. (1978). What did the brain say to the mind? A study of the detection and report of ambiguity by young children. In A. Sinclair, R. J. Jarvella, & W. J. M. Levelt (Eds.), *The child's conception of language* (pp. 97–132). Berlin: Springer-Verlag.

HOFFMAN, R. R., & HONECK, R. P. (1980). A peacock looks at its legs: Cognitive science and figurative language. In R. P. Honeck & R. R. Hoffman (Eds.), *Cognition and figurative language* (pp. 3–24). Hillsdale, NJ: Erlbaum.

KAGAN, J. (1967). On the need for relativism. *American Psychologist, 22,* 131–143.

KAMHI, A. G. (1987). Metalinguistic abilities in language-impaired children. *Topics in Language Disorders, 7,* 1–12.

KAMHI, A. G., & CATTS, H. (1986). Toward an understanding of developmental language and reading disorders. *Journal of Speech and Hearing Disorders, 51,* 337–348.

KAMHI, A. G., LEE, R., & NELSON, L. (1985). Word, syllable, and sound awareness in language-disordered children. *Journal of Speech and Hearing Disorders, 50,* 207–212.

LEE, R., & KAMHI, A. (1985, November). *Verbal metaphor performance in learning disabled children.* Paper presented at the Annual Convention of the American Speech-Language-Hearing Association, Washington, DC.

LUND, N., & DUCHAN, J. (1983). *Assessing children's language in naturalistic contexts.* Englewood Cliffs, NJ: Prentice-Hall.

MCGHEE, P. E. (1971). The role of operational thinking in children's comprehension and appreciation of humor. *Child Development, 42,* 123–138.

MCGHEE, P. E. (1974). Cognitive mastery and children's humor.

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx

Psychological Bulletin, 81, 721–730.
NIPPOLD, M. A. (1985). Comprehension of figurative language in youth. *Topics in Language Disorders, 5,* 1–20.
NIPPOLD, M. A., & FEY, S. H. (1983). Metaphoric understanding in preadolescents having a history of language acquisition difficulties. *Language, Speech, and Hearing Services in Schools, 14,* 171–180.
NIPPOLD, M. A., MARTIN, S. A., & ERSKINE, B. J. (1988). Proverb comprehension in context: A developmental study with children and adolescents. *Journal of Speech and Hearing Research, 31,* 19–28.
PEPICELLO, W. J. (1980). Linguistic strategies in riddling. *Western Folklore, 39,* 1–16.
PEPICELLO, W. J., & WEISBERG, R. W. (1983). Linguistics and humor. In P. E. McGhee & J. H. Goldstein (Eds.), *Handbook of humor research* (pp. 59–83). Berlin: Springer-Verlag.
SCHUMAKER, J., & DESHLER, D. (1984). Setting demand variables: A major factor in program planning for the LD adolescent. *Topics in Language Disorders, 4,* 22–40.
SEIDENBERG, P. L. (1988). Cognitive and academic instructional intervention for learning-disabled adolescents. *Topics in Language Disorders, 8,* 56–71.
SEIDENBERG, P. L., & BERNSTEIN, D. K. (1986). The comprehension of similes and metaphors by learning-disabled and nonlearning-disabled children. *Language, Speech, and Hearing Services in Schools, 17,* 219–229.
SEMEL, E., WIIG, E. H., & SECORD, W. (1987). *Clinical evaluation of language fundamentals—Revised.* San Antonio, TX: The Psychological Corp.; Harcourt Brace Jovanovich.
SHULTZ, T. R. (1974). Development of the appreciation of riddles. *Child Development, 45,* 100–105.
SHULTZ, T. R., & HORIBE, F. (1974). Development of the appreciation of verbal jokes. *Developmental Psychology, 10,* 13–20.
SHULTZ, T. R., & PILON, R. (1973). Development of the ability to detect linguistic ambiguity. *Child Development, 44,* 728–733.
VAN KLEECK, A. (1984). Metalinguistic skills. In G. Wallach & K. Butler (Eds.), *Language learning disabilities in school-age children* (pp. 128–153). Baltimore, MD: Williams & Wilkins.
WALLACH, G. P., & LEE, D. A. (1980). So you want to know what to do with language disabled children above the age of six. *Topics in Language Disorders, 1,* 99–113.
WIIG, E. H. (1984). Language disabilities in adolescents: A question of cognitive strategies. *Topics in Language Disorders, 4,* 41–58.
WIIG, E. H., & SEMEL, E. M. (1984). *Language assessment and intervention for the learning disabled.* Columbus, OH: Merrill.
WONG, B. Y. L. (1987). How do the results of metacognitive research impact on the learning disabled individual? *Learning Disability Quarterly, 10,* 189–195.
WONG, B. Y. L., & JONES, W. (1982). Increasing metacomprehension in learning disabled and normally achieving students through self-questioning training. *Learning Disability Quarterly, 5,* 228–246.

Received March 21, 1989
Accepted January 10, 1990

Requests for reprints should be sent to Cecile C. Spector, Ph.D., Long Island University—Rockland Campus, Route 340, Orangeburg, NY 10962.

Downloaded From: http://jshd.pubs.asha.org/ by a University of Texas, Austin User on 11/04/2016
Terms of Use: http://pubs.asha.org/ss/rights_and_permissions.aspx