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A Correlation Study of the Northwestern Syntax Screening Test and the Grammatic Closure Subtest of the Illinois Test of Psycholinguistic Abilities

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A CORRELATION STUDY OF THE NORTHWESTERN SYNTAX SCREENING TEST AND THE GRAMMATIC CLOSURE SUBTEST OF THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES

by
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This thesis submitted by Karen M. Thompson in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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ABSTRACT

The purpose of this study was to examine the relationship between the Grammatic Closure (GC) subtest of the Illinois Test of Psycholinguistic Abilities (ITPA) and both the receptive and expressive portions of the Northwestern Syntax Screening Test (NSST-R) (NSST-E). Another aim of this study was to obtain an indication as to whether or not these assessments are more strongly a measure of visual or of auditory comprehension.

The subjects included thirty-eight children selected from Sacred Heart School in East Grand Forks, Minnesota. The subjects were screened according to established criteria and all subjects who failed to meet the requirements were excluded from the study. All subjects were seen on an individual basis.

The NSST, GC subtest, Visual Reception (VR) subtest, and the Auditory Reception (AR) subtest of the ITPA were administered by the researcher and another qualified graduate student. The VR and AR subtests were utilized to measure auditory and visual comprehension. Data obtained from the four assessments were analyzed by inter-correlation analysis.

Results indicated a moderately high correlation between the NSST-E and the GC (.68) and a moderately low correlation between the NSST-R and the GC (.36). Low correlations resulted among the NSST-R and the VR (.08) and AR (.10) subtests. A moderately low correlation

resulted between the NSST-E and AR (.38) with a low correlation between the NSST-E and VR (.26). Moderate correlations resulted among the GC, AR (.52), and VR (.41) subtests of the ITPA.

The results of the study indicated that the GC subtest and the NSST-E were measuring similar aspects of syntax. In view of this fact, it was concluded that if during screening one must choose between the GC subtest of the ITPA and the NSST, the GC subtest would be recommended because it is less time consuming to administer and can be utilized for a wider age range. However, it must be recognized that the less time consuming measure (GC subtest) also obtains more limited information due to the lack of a receptive measure. The NSST-E correlated higher with auditory comprehension (.38) than to visual comprehension (.26). The NSST-R was not related to either auditory or visual comprehension. The GC subtest was more related to auditory than to visual comprehension.

CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

The purpose of this study was to examine the relationship between the Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities and both the receptive and expressive portions of the Northwestern Syntax Screening Test. Another aim of this study was to obtain an indication as to whether or not these assessments are more strongly a measure of visual or of auditory comprehension.

A study by Kelly (1972) investigated the relationship between the Grammatic Closure subtest (GC) and the Northwestern Syntax Screening Test (NSST). Kelly surveyed the files at three diagnostic centers in Grand Forks, North Dakota. The study resulted in high correlations between the two assessments. A correlation coefficient of .77 resulted between the expressive portion of the NSST and the Grammatic Closure subtest. Comparison of the receptive portion of the NSST and the Grammatic Closure subtest resulted in a correlation coefficient of .76. The linguistic impairment common in the population resulted in a general lowering of performance in all language areas. It was suggested by Kelly that future investigation employ a population which excludes language involvement and includes a narrow age range.

Peterson (1973), a diagnostician at the Evaluation Center for Exceptional Children at the University of North Dakota, stated that

often when both the GC subtest and the NSST were administered, only one measurement seemed necessary. Peterson noted that the results from these two assessments were generally very similar.

Ordinarily a child is administered a series of tests during a complete language evaluation. To save time, the clinician could administer one assessment rather than both assessments in an evaluation. The clinician may be able to administer a particular test which will determine how well the child will perform on another measurement of syntax or grammar.

Some Available Tests of Syntax and Grammar

The diagnostician or clinician in speech pathology has available several instruments developed to assess syntax and grammar, such as the Test For Auditory Comprehension of Language, Exploratory Test of Grammar, "Is This Good Talking?", a portion of the Michigan Picture Language Inventory, Houston Test For Language Development, "Token Test," Assessment of Children's Language Comprehension, Northwestern Syntax Screening Test, and the Grammatic Closure subtest of the Illinois Test of Psycholinguistic Abilities.

Carrow's Test For Auditory Comprehension of Language (1973) attempts to assess the child's basic rules governing linguistic competence (Berry, 1969). It consists of sets of plates containing one or two black and white line drawings which assess form classes and function words such as nouns, verbs, adjectives, adverbs, and prepositions; morphological constructions; grammatical categories; and syntactic structures (Carrow, 1968). Most of the vocabulary items are those learned early in the developmental sequence. The items of this

test are sequenced by grammatical category and not the level of difficulty (Carrow, 1973). An advantage of this test is that it requires no verbalization on the part of the child. However, no verbalization on the part of the child may also be a disadvantage in that it is exclusively a receptive measure and no comparison is made of the child's receptive abilities with his spontaneous use of the same items (Lee, 1970).

The Exploratory Test of Grammar developed by Berry and Talbott (1966) examines the ability of the child to develop rules of grammar or morphological development. It consists of thirty cardboard plates which utilize nonsense words and several actual words to represent the names of individuals or depict individuals performing actions in such a way as to prevent the child from associating these with actual words for animals or people (Irwin and Marge, 1972). The child is to supply the appropriate ending or inflection when called upon to respond (Berry, 1969). For example: "This is a man who knows how to spow. He is spowing. He did the same thing yesterday. What did he do yesterday? Yesterday he _____" (Lee, 1970, p. 103). A weakness of this assessment is that it measures only expression. The test assesses plurals, possessives, verb tenses, derivations, and compound words. This test does not include word order, questions, negatives, passives, or subject-object identification. The test is considered to be a good screening tool of morphology and syntax (Irwin and Marge, 1972).

"Is This Good Talking?" devised by McGrath (1970) is to be utilized as a language screening instrument. It consists of forty correct and incorrect declarative sentences in the receptive portion

and twenty incorrect sentences in the expressive portion. During the receptive portion the children are required to respond by "yes" or "no" to the correctness or incorrectness of the sentence as it is presented by the examiner. During the expressive portion, they are required to reformulate incorrect sentences into grammatically correct sentences that do not alter the meaning. No normative data has been established for this assessment. Hilden (1973) suggested that the test be revised to include a greater variety of grammatical structures.

The Michigan Picture Language Inventory developed by Lerea (1958) assesses both expression and comprehension. The test includes fifty picture cards which test language structure. The language structure part of the Inventory assesses singular and plural nouns, personal pronouns, possessives, adjectives, demonstratives, articles, adverbs, prepositions, and verbs and their auxiliaries. The test occurs in three steps and each word class is tested separately (Berry, 1969). This test utilizes the missing word technique as does Berry and Talbott's test and the GC subtest of the ITPA. An example of this test is (Lee, 1970, p. 104): "In this picture the girl sleeps in her bed. In this picture the rabbit sleeps in its bed. And in this picture the boy sleeps in _____." The receptive and expressive measures are derived from the same linguistic tasks, and therefore the derived norms compare receptive and expressive performance in a meaningful way.

The Houston Test For Language Development developed by Crabtree (1958) is divided into two parts. Part I includes a language scale for children six months through three years of age and Part II extends through the age of six. The test includes several categories, one of which is referred to as syntactical complexity. "The Houston Test is

a relatively popular one, primarily with persons unsophisticated with language development of young children" (Irwin and Marge, 1972, p. 266).

De Renzi and Vignolo (1962) originally devised the "Token Test" to assess subtle receptive language disturbances in adults. It has since then been revised by several people and is now being utilized with children. The test consists of five parts, the fifth part consisting of items which measure grammatical complexity. Tentative normative data is available, but the test is not published or standardized. The vocabulary limitation of the "Token Test" makes it more purely a measure of receptive language skills and it makes it more culture free than most instruments currently in use (Weiss and Wilma, 1973).

The Assessment of Children's Language Comprehension (ACLC) devised by Foster, Giddan, and Stark attempts to "determine the level at which the child is unable to process and remember lexical items in syntactic sequences" (Foster, Giddan, and Stark, 1972, p. 14). The test consists of four parts (A, B, C, D) which increase in the number of critical elements or syntactic units which are tested. The ACLC requires no verbalization on the part of the child. Norms are available for children between the ages of three to seven years.

The NSST (Lee, 1971) is an outgrowth of independent studies and was developed and standardized on 344 children at Northwestern University. It is commercially available and its most recent copyright is 1971.

According to Lee, the NSST is to be utilized only as a screening instrument. A screening test is one that discriminates those children

with problems from others with normal language without detailed analysis of the problems (Van Riper, 1963). This assessment is not to be considered a measurement of a child's general language skill nor as an "in depth" study of syntax. It will isolate those children between three to eight years of age who are deviant enough in receptive and expressive syntactic development to warrant further evaluation (Lee, 1969). This test assesses such items as prepositions, negatives, plurals, subject-object identification, indirect objects, personal pronouns, verb tenses, yes-no passives, and reflexive pronouns.

Items necessary for the administration of the test include: 1) NSST Manual; 2) twenty plates each containing four pictures (NSST-R) and twenty plates each containing two pictures (NSST-E); 3) response form with sentence pairs arranged in order of increasing difficulty; 4) percentile graphs for the receptive and expressive portions for comparison of the results.

No reliability information was obtained from either the author or publisher. The NSST Manual does not contain any information pertaining to the reliability of the NSST.

The drawings of the NSST are black and white sketches. Scoring instructions are general with only a few examples. No extensive examples are given to resolve questionable responses. The following are general rules for scoring (Lee, 1971, pp. 3-4):

1. Any change of the examiner's spoken sentence which affects the test item [syntactic form] is considered a failure, even though the child's response is grammatically and semantically correct.

. . . . . .

2. Any response which contains a grammatical error, even though it is not the test item, is considered a failure

> on the grounds that the test item, though correct, may have introduced enough complexity to cause other structures to be dropped.
>
> . . . . . .
>
> However, any change of the examiner's spoken sentence which does not change the test item and which still produces a grammatically and semantically correct sentence is acceptable and scores 1.
>
> . . . . . .

The speech pathologist must be able to distinguish between primitive forms of verbs and verbs which are learned later developmentally. Substitution of a more primitive verb form for a more advanced verb form would be scored incorrect even though the sentence is grammatically correct. Because of this scoring complication, scores might not always be reliable.

The NSST as well as the GC subtest are "limited in their usefulness in predicting a child's performance in spontaneous speech" (Lee and Canter, 1971, p. 316). Another concern has been that a child's limits in the area of auditory sequential memory tend to confound the results obtained on the expressive portion. However, Hilden (1973) found that a low correlation of .26 existed between the NSST-E and the Auditory Sequential Memory subtest of the ITPA. A .28 correlation existed between the NSST-R and the Auditory Sequential Memory subtest. Hilden (1973, p. 23) noted that because grammatical structures such as future tense are difficult to represent in a drawing, the "use of picture stimuli may penalize the subject in some instances when in fact he does understand the grammatical structure."

Norms for the NSST are in the form of lines on a graph. An individual's raw score must be interpolated on a rather steep curve. When the examiner plots the score, it may be difficult to determine

which percentile to utilize, an example being when the score is between the twenty-fifth percentile and the tenth percentile. Also the NSST Manual is not clear concerning which age level to use to determine the percentile if the child is midway between two ages or approaching a new age. The NSST Manual states that the examiner is to utilize the next highest age if the child is at an extreme age level, but does not define what is "extreme."

The Grammatic Closure subtest (GC) of the ITPA attempts to assess syntax, grammar, and morphological abilities. This subtest is one of ten subtests and two supplementary tests of the ITPA. The ITPA (Kirk, McCarthy, and Kirk, 1968) was devised for children between the ages of two to ten years with accompanying normative data on 1,000 children. These subjects, according to Chase (1972) included only children from English-speaking environments, average school achievement, average intelligence, and who had no sensory-motor involvement.

The authors of the ITPA claim that it is a diagnostic test which "assesses specific abilities, disabilities, and achievements of a child in such a way that remediation of defects can logically follow" (Kirk and Kirk, 1972, p. 10). The primary purpose of the test is to compare the child's abilities and disabilities against himself. However, the test emphasizes interindividual differences as well as intraindividual differences.

The ITPA is based upon a three dimensional model which is described, in general, as follows:

1. Channels of Communication
    a. auditory-vocal - sensory impressions are received through the ear and a verbal response is made.

b. visual-motor - sensory impressions are received through the eye and a response is made through a gesture.

2. Processes

a. reception - mind receives meaning through language.

b. expression - meaning is related through linguistic symbols or gestures.

c. organizing - linguistic symbols are related internally.

3. Levels

a. automatic - behavior requiring less voluntary, but highly organized and integrated patterns. This level is independent from any meaning and is not broken into processes.

b. representational - behavior requiring more complex processes utilizing symbols which carry meaning.

The GC subtest involves the automatic level, auditory-vocal channel, and the organizing process. This subtest was referred to as the Auditory-Vocal Automatic subtest in the Experimental Edition of the ITPA. The GC subtest is referred to as a quick screening test by Lee and Canter (1971). Pertaining to the GC subtest, Kirk and Kirk (1972, p. 112) stated, "an attempt has been made to test the degree to which a child has acquired automatic habits for handling syntax and grammatical inflections." Grammatical inflections involve the "addition of certain endings to the base of a word to express grammatical relationships and functions and aspects" (Pei and Gaynor, 1954, p. 101). For example, the child may not be utilizing plurals and

verb tenses in an appropriate manner. The child, according to Kirk and Kirk (1972), may refer to "iron" as an "ironer" which is logical, but not habitual or customary. So at this automatic level the GC subtest measures the subject's performance against that which is customary and habitual rather than that which is logical.

A child who scores poorly on this subtest may have difficulty with plurals, past tenses, irregular verb forms, and may mispronounce words. The child may also have difficulty placing verbs and adjectives in their proper places. Low scores may be indicative of the child having trouble learning nursery rhymes, learning to tell time, learning multiplication, learning to count, or learning names of people (Kirk and Kirk, 1972).

The subtest consists of thirty-three orally presented items accompanied by pictures. It utilizes the missing-word technique which requires the child to verbally complete phrases that are incomplete. This missing-word technique has been criticized by Lee (1970). Lee stated that this method restricts the kind of linguistic tasks which can be assessed. It is highly effective in revealing a child's ability to formulate a proper morphological form for a given word or to select an appropriate function word, such as a pronoun or a preposition. But the missing-word technique cannot incorporate syntactic tasks involving word order, i.e., questions, passives, negatives, noun phrases, subject-object distinction, or auxiliary verb arrangements. Lee also stated that any test of language development which extends beyond morphology and function words to include grammatical relationships underlying kernel sentence construction and transformational operations must use

whole sentences not single words. The GC subtest has also been criticized by Carroll (1972) who stated that it requires the child to be familiar with or conform to the norms of "standard" American English. Nonstandard English (Perrin and Smith, 1962) refers to every day speech of many people. It is speech that has been relatively untouched by tradition or by school instruction. The standard language is that "which has gained literary and cultural supremacy over the other dialects and is accepted by the speakers of the other dialects as the most proper form of that language" (Pei and Gaynor, 1954, p. 203).

Kirk and Kirk (1972) suggested that the ITPA does not circumvent cultural factors. A child, for instance, may be deficient on the GC subtest when he comes from a language-deprived home. A deficiency on this subtest would probably be a result of the subtest which involves grammatical features with which the child may not be familiar. Lee (1970) stated that analysis of competence by an expressive performance measure is effective with normal children, but it is not always an assured method on a speech clinic population. Children with language problems may have developed grammar receptively, and not expressively due to handicapping conditions. Carroll (1972) stated that the ITPA does not include the mean length of an utterance which has been found to be highly indicative of a child's linguistic level.

An asset of the GC subtest is that its scoring criteria is clearly and specifically defined. The manual indicates, by examples, responses to be scored correct or incorrect and ones that require

repetition of the statement. This promotes confidence in scoring and in the administration of the test.

The GC subtest and the NSST will be studied because of their general usage and familiarity to diagnosticians in the clinics and rehabilitation centers as well as to speech clinicians in the schools.

Language and Its Related Components

Language, as defined by Carroll (1953, p. 10), is:

> . . . a structured system of arbitrary vocal sounds and sequences of sounds which are used in interpersonal communication and which rather exhaustively catalog the things, events, and processes of human experience.

In other words, the language system includes sounds, words, and grammatical patterns (Kelly, 1972). Grammar and syntax are closely related aspects of language. Grammar involves the classes of words, inflections of words, and functions and relations of words within sentences. Syntax refers to one specific aspect of grammar, the relationship of words in sentences and the ways they are combined to develop phrases or sentences (Raph, 1967). Morphology is one aspect of syntax which involves the formation of words to indicate a change in meaning (Irwin and Marge, 1972).

Chomsky (1969) stated that a mature speaker has internalized complex rules of grammar into his language. The child relates various aspects of internalized grammar, many of which are not evident in spontaneous speech. According to Berry (1969, p. 132):

> Noam Chomsky was among the first to call attention to the importance of syntactic structure in developing language. He and his fellow linguists have attempted to find universal rules which generate functional grammars. These universal features of grammar, Chomsky believes, are innate in the human being for they vary little from language to language.

> Hence a child has internalized a set of rules for forming, using, and understanding sentences.

Statement of the Problem

There are many explanations for the child's acquisition of grammatical structures. Some children may have unrecognized linguistic problems. The speech pathologist must be able to screen children within a reasonable amount of time to allow for further evaluation or for therapy. With this in mind, an attempt was made to determine the relationship between the NSST and the GC subtest of the ITPA. If a significant relationship does exist, it may indicate that both assessments measure similar aspects of syntax and grammar. A high correlation may indicate that only one of these assessments is necessary for screening syntax and grammar.

Kelly's study included a large sample (139 subjects), but the subjects were all linguistically impaired. Because of the sample that was utilized, a sample using normal children may generate different results.

Both the GC subtest of the ITPA and the NSST involve simultaneous presentation of visual and auditory stimuli. Therefore, an aim of this study was to obtain an indication as to whether they are more strongly a measure of visual or of auditory comprehension to provide more insight into the nature of the two assessments.

The following questions were investigated in this study:

1. What is the relationship between the GC subtest of the ITPA and the expressive portion of the NSST?

2. What is the relationship between the GC subtest of the ITPA and the receptive portion of the NSST?

3. What are the relationships among the Visual Reception subtest, Auditory Reception subtest, and the NSST?

4. What are the relationships among the Visual Reception, Auditory Reception, and the GC subtests of the ITPA?

CHAPTER II

PROCEDURES

Subjects

The subjects included thirty-eight children from Sacred Heart School in East Grand Forks, Minnesota. The children ranged in age from six years eight months to seven years ten months with a mean age of seven years three months. The original population of forty-six children was screened and all children not meeting the established criteria were excluded from the study.

Criteria for the acceptance of children to be studied were as follows:

1. The child exhibited no known or observable physical or neurological impairment.
2. The child was not retained in a grade in school for any reason.
3. The child passed a binaural hearing screening test at 25dB for the frequencies 500, 1000, and 2000 Hz.
4. The child had not previously been enrolled in speech therapy.
5. The child's speech was understandable and the child did not omit the final /s/ or /z/ phonemes determined by repetition of words by the child.

Eight children were excluded from the study because they failed to meet the above requirements. Two children had been retained in first grade, two children exhibited possible hearing losses and were enrolled in speech therapy, and the remaining four children were or had been enrolled in speech therapy.

Testing Procedure

The assessments were administered by the researcher and another qualified graduate student. Hearing of all the children was screened at 25dB for the frequencies 500, 1000, and 2000 Hz. with a Telex 88 screening audiometer calibrated according to ISO standards. The audiometer was checked for calibration before and after the testing procedure and was found to be in calibration. All subjects were required to repeat the words cheese, else, race, fence, house, please, Charles, perhaps, Mars, horse, box, James, pants, and news. Any subject who omitted any final /s/ or /z/ phoneme was excluded from the study. The subject was considered acceptable for the study when any form of the phonemes was produced, even if the phonemes were distorted. This short test was administered to eliminate children who exhibited any articulation errors that might be confused with syntactic problems involving plurals or possessives during expressive language testing.

The subjects were administered the NSST and the GC, AR, and VR subtests of the ITPA. The order of presentation of the tests was sequentially varied to couterbalance any possible order effect. The GC subtest and the NSST were timed with a stop watch for all subjects

to determine the average administration time. Each child received all tests on an individual basis. The administration of the tests occurred in a quiet setting which consisted of a small room beside the school library.

Administration of the NSST

All subjects were presented the receptive portion of the NSST which consists of four pictures on each of twenty pages. Each page consists of two decoy pictures and two pictures which illustrate contrasting grammatical structures. The NSST-R was administered with an initial demonstration item followed by item one of the receptive portion according to specific directions supplied by the NSST Manual (Lee, 1971, p. 2):

> I'm going to tell you about these pictures. When I'm done, you show me the right picture. Look at all the pictures. Don't point until I tell you. (Show page 1). The cat is behind the chair. The cat is under the chair.* Show me The cat is under the chair. (Child points.) Now show me The cat is behind the chair. (Child points.)

The expressive portion of the NSST is simplified by the utilization of only two pictures and the elimination of decoy pictures. Each sentence on the response form was read by the examiner without pointing initially. After the demonstration item, all items of the expressive portion were administered in the following manner (Lee, 1971, p. 2):

> I will tell you about these pictures. When I am done you copy me. Say just what I say. Don't talk until I tell you, though. Ready? Listen. (Show page 1.) The baby is sleeping.* The baby is not sleeping. Now, what's this picture? (Esaminer points to the asterisked picture, and the child replies.) Now, what's this one? (Examiner points to unasterisked picture, and child replies.)

Responses given by the child were recorded by the examiner on the response form. Correct responses yielded a score of one (1) point with a possible score of two (2) points to be recorded for each test item. A failure resulted in a score of zero (0) points. An error on the receptive portion consists of the wrong picture identification in response to the sentence given by the examiner. An error on the expressive portion consists of a response given by the child which affects the test item and results in a grammatically incorrect sentence.

Administration of the GC subtest

The GC subtest of the ITPA was administered to each child according to specific instructions in the Examiner's Manual. Each child was presented a demonstration item prior to the administration of the thirty-three items which consist of a complete statement followed by an incomplete statement which was to be completed by the child. The statements which correspond to the sentences are written on the back of Picture Book Two and were read by the examiner with an emphasis to the underscored words. An example of the demonstration item (Kirk, McCarthy, and Kirk, 1968, p. 70) is as follows:

> Examiner points to the first bed and says, HERE IS A BED. He then points to two beds and says, HERE ARE TWO ____. (Examiner stops abruptly.) If the subject fails to respond or responds incorrectly, as with "two," "more," or "yes," the examiner asks, TWO WHAT? TWO BEDS? Then the examiner repeats the item, pointing and saying, HERE IS A BED. HERE ARE TWO ____? When the subject responds correctly, the examiner says YES, HERE IS A BED. HERE ARE TWO BEDS.

All subjects regardless of their age began with item one. If the subject gave no form of the response considered to be correct,

the examiner said "no" and the item was repeated with greater emphasis to the underscored word. The Examiner's Manual contains specific scoring standards which were referred to by the examiner to determine if an item was repeatable or if an item was correct or incorrect. A check mark was placed on the response form for the responses that were certain to be correct, and all questionable responses or incorrect responses were written on the blanks of the response form.

One point was given for each correct response. The raw score was computed by summation of the correct responses on the subtest.

Administration of the Auditory Reception subtest of the ITPA

The Auditory Reception subtest assesses the ability to derive meaning from verbal presentations by the examiner. The subtest contains fifty questions to which the subject responded "Yes" or "No" or by nodding or shaking his head. The vocabulary items in the subtest progressively increase in difficulty.

Examples of some of the questions presented to the subjects were as follows (Kirk, McCarthy, and Kirk, 1968, p. 23):

"Do boys play?"
"Do bananas telephone?"
"Do logs burn?"

A basal and ceiling was established and correct and incorrect responses were indicated by encircling either Y (yes) or N (no) on the examiner's response form.

Administration of the Visual Reception subtest of the ITPA

The Visual Reception subtest assesses the child's ability to derive meaning from visual stimuli. The subtest involves forty

picture items which require pointing behavior of the child to indicate a response. The child was shown a stimulus picture for three seconds and then shown another page with four structurally similar items, one of which was conceptually similar to the item on the preceding page. The child was required to point to the conceptually similar picture. A basal and ceiling was established and the examiner encircled the number on the response form which corresponded to the picture to which the child pointed.

Tester Reliability

The Pearson product-moment correlation coefficient was utilized to determine tester reliability. Inter-reliability of the GC subtest was established prior to the testing procedure by comparison of test results of eight subjects from two examiners. Inter-reliability was established at a correlation coefficient of .92. Intra-reliability of the GC subtest was established prior to the testing procedure by each of the two examiners by comparison of the test results of six subjects. The GC subtest was administered twice to each subject. Intra-reliability resulted in a correlation coefficient of .99 for one examiner and .86 for the other. Intra-reliability for both examiners was computed at a correlation coefficient of .93.

CHAPTER III

RESULTS AND DISCUSSION

Data were analyzed on the basis of raw scores obtained from thirty-eight normal first grade subjects on the Grammatic Closure (GC), Auditory Reception (AR), Visual Reception (VR) subtests of the Illinois Test of Psycholinguistic Abilities (ITPA), and the receptive and expressive portions of the Northwestern Syntax Screening Test (NSST-R) (NSST-E).

Results

The correlation matrix in Table 1 depicts the analysis of the GC, AR, VR, NSST-R, and the NSST-E. The results indicate a moderately

TABLE 1

CORRELATION MATRIX OF THE GC, AR, VR, NSST-R AND NSST-E

	GC	AR	VR	NSST-R	NSST-R
GC		.52[c]	.41[a]	.36[a]	.68[c]
AR			.17	.10	.38[a]
VR				.08	.26
NSST-R					.46[b]
NSST-E					

[a]Significant at the .05 level.
[b]Significant at the .01 level.
[c]Significant at the .001 level.

high correlation between the NSST-E and the GC (.68) and a moderately low correlation between the NSST-R and the GC (.36). Low correlations resulted among the NSST-R and the VR (.08) and AR (.10) subtests. A moderately low correlation resulted between the NSST-E and AR (.38) with a low correlation between the NSST-E and VR (.26). Moderate correlations resulted among the GC, AR (.52), and VR (.41) subtests of the ITPA.

The maximum score on the GC subtest is thirty-three, the AR maximum score is fifty, and the VR contains forty possible correct responses. The highest possible score of the NSST-E is forty and the NSST-R contains forty possible total points. Table 2 contains the means and standard deviations of the raw scores of the subjects.

TABLE 2

MEANS AND STANDARD DEVIATIONS OF ALL TESTS

	Mean	Standard Deviation
GC	22.4	3.5
AR	32.9	9.3
VR	23.8	5.7
NSST-R	34.2	3.1
NSST-E	33.0	4.1

The standard deviations show that there was less variability around the mean of the GC subtest than of the NSST-E. There was less variability around the mean of the NSST-R than around the mean of the GC subtest.

Discussion

A correlation of .68 was obtained between the GC subtest and the NSST-E. This relationship was significant at the .001 level. The percentage of relationship between the two subtests, estimated as r^2, was 46% (i.e., $.68^2 = .46$). Therefore, 46% of the variance of one subtest was predictable by the variance of the other subtest. This moderately high correlation suggested that the GC subtest and the NSST-E were measuring similar syntactic abilities. The .36 correlation between the GC subtest and the NSST-R was significant at the .05 level. The percentage of relationship was calculated to be 13% (i.e., $.36^2 = .13$). The higher .68 correlation between the GC subtest and the NSST-E was understandable since the GC subtest also consisted of expressive items. In view of the moderately high correlation, if screening for expressive ability, consideration might be given to administering one instrument rather than both. If the examiner is also interested in measuring receptive abilities this would not be appropriate. The NSST would be preferable as a screening instrument in this situation, since it also provides a receptive measure.

The mean administration time of the NSST was nine minutes forty-seven seconds and the mean administration time of the GC subtest was four minutes thirty-four seconds. When screening large numbers of children, five additional minutes for each child would add up to a considerable amount of therapy time. However, the GC subtest should be utilized with the understanding that less information will be obtained due to the lack of a receptive measure. If the receptive and expressive measures were both preferred, the NSST may be the

instrument to be utilized. Also the examiner needs to consider the age of the child to be evaluated. The GC subtest can be administered to a wider age range of children (two years to ten years) than the NSST (three years to eight years). The wider age range may allow the speech pathologist to screen one or two more grades in the schools.

The correlations obtained among the GC subtest, NSST-R (.36) and NSST-E (.68) were lower than the correlation coefficients which resulted from Kelly's study (1972) (GC and NSST-R, .76) (GC and NSST-E, .77). In the present study, elimination of language impaired subjects and the narrower age range may have restricted the range of scores, thereby reducing the correlations.

A low correlation of .10 was obtained between the NSST-R and the AR subtest. A correlation of .08 resulted between the NSST-R and the VR subtest. This indicates that the NSST-R is not related to either the VR or AR subtests. A moderate correlation of .38 between the AR subtest and the NSST-E was significant at the .05 level. A low correlation (.26) resulted between the VR subtest and the NSST-E. The NSST-E correlated higher with auditory comprehension (.38) than to visual comprehension (.26). However, the NSST-E and NSST-R was not highly correlated to either the auditory or visual modalities.

A correlation of .52 was obtained between the GC and AR subtests, which was significant at the .001 level. A moderate correlation of .41 resulted between the GC and VR subtests. This was significant at the .05 level. Thus, the GC subtest appeared to be more related to auditory than to visual comprehension. The AR subtest involves the auditory-vocal channel only and the VR subtest deals

mostly with the visual-motor channel. Therefore, it may be assumed that each test assesses one modality with little involvement of other modalities. The GC subtest purports to assess at the automatic level, auditory-vocal channel, and the organizing process. The .52 correlation supports the contention that the GC subtest utilizes the auditory channel, however, there was also a substantial relationship between the VR and GC subtests. The GC subtest may be testing at the representational level to a moderate degree, since both the AR and VR subtests of the ITPA involve the representational level. However, the relationship of the GC subtest with the other ITPA subtests at the representational level should be evaluated.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

This study was concerned with examining the relationship between two assessments of syntax and grammar, and the relationship of visual and auditory comprehension to both assessments of syntax and grammar.

Subjects consisted of thirty-eight children from Sacred Heart School in East Grand Forks, Minnesota. The assessments utilized to assess syntax and grammar were the Northwestern Syntax Screening Test (NSST) and the Grammatic Closure (GC) subtest of the ITPA. The Auditory Reception (AR) and Visual Reception (VR) subtests of the ITPA were administered to determine the relationship of visual and auditory comprehension to the NSST and the GC subtest.

The results indicated a moderately high correlation between the NSST-E and the GC (.68) subtest and a moderately low correlation between the NSST-R and the GC (.36) subtest. This suggests that the expressive portion of the NSST and the GC subtest are measuring similar syntactic abilities. The receptive portion of the NSST and the GC subtest are measuring similar syntactic abilities to a much more limited degree. Low correlations resulted among the NSST-R and the VR (.08) and AR (.10) subtests. Moderately low correlations were

obtained between the NSST-E and the AR (.38) subtest with a low correlation of .26 between the NSST-E and the VR subtest. Moderate correlations resulted among the GC, AR (.52), and VR (.41) subtests.

Conclusions

In view of the moderately high correlation obtained between the NSST-E and the GC subtest, the GC subtest could be utilized for screening rather than the NSST since it is less time consuming to administer and could be administered to a wider age range. However, it must be recognized that the less time consuming measure (GC subtest) also obtains more limited information due to the lack of a receptive measure.

The following are suggestions and implications for further research:

1. The GC subtest should be examined in relationship to all of the ITPA subtests at the representational level to obtain an indication as to whether or not the GC subtest assesses at the representational level.

2. The scoring criteria of the NSST should be more clearly defined. A table with examples of correct, incorrect, and repeatable items is recommended to facilitate and improve the scoring procedure.

3. Children with borderline language problems diagnosed by a test battery and children with confirmed normal language should have their GC subtest and NSST scores examined to determine if either or both would have functioned as effective screening devices.

APPENDIX A

NORTHWESTERN SYNTAX SCREENING

TEST RECORD FORM

NORTHWESTERN SYNTAX SCREENING TEST
RECORD FORM

Name_____ Sex_____ Date_____ B.D._____ C.A._____

Receptive score_____ Percentile_____ Expressive score_____ Percentile_____

Father's occupation_____ Mother's occupation_____

Examiner_____ Testing location_____

Receptive		Expressive	
1. The cat is behind the chair. The cat is under the chair.*		1. The baby is sleeping.* The baby is not sleeping.	
2. She goes upstairs.* He goes upstairs.		2. The dog is on the box. The dog is in the box.*	
3. The cat is on the cupboard. The cat is in the cupboard.*		3. She sees the car.* He sees the car.	
4. The boy is sitting.* The boy is not sitting.		4. The cat is behind the desk. The cat is under the desk.*	
5. The deer is running.* The deer are running.		5. The boy pulls the girl. The girl pulls the boy.*	
6. The boy sees the cat. The boy sees the cats.*		6. The fish is swimming.* The fish are swimming.	
7. The boy sees himself. The boy sees the shelf.*		7. The girl sees the dog. The girl sees the dogs.*	
8. The milk spilled. The milk spills.*		8. This is their wagon.* This is his wagon.	
9. The car hits the train. The train hits the car.*		9. The cats play. The cat plays.*	
10. This is their dog.* This is her dog.		10. Mother says, "Where is that boy?"* Mother says, "Who is that boy?"	
11. This is a mother cat.* This is Mother's cat.		11. The boy washes himself. The boy washes the shelf.*	
12. The girl will drink.* The girl is drinking.		12. This is my dog.* That is my dog.	
13. Mother says, "Look who is here." Mother says, "Look what is here."*		13. The car is in the garage. Is the car in the garage?*	
14. The dog is in the box. Is the dog in the box?*		14. The boy will throw.* The boy is throwing.	
15. The boy writes. The boys write.*		15. The boy jumped. The boy jumps.*	
16. Mother says, "Where is that girl?"* Mother says, "Who is that girl?"		16. Mother says, "Look who I found." Mother says, "Look what I found."*	
17. Has Daddy finished dinner? Daddy has finished dinner.*		17. Has the boy found his ball? The boy has found his ball.*	
18. The boy is pushed by the girl.* The girl is pushed by the boy.		18. This is a baby doll.* This is Baby's doll.	
19. This is my hat.* That is my hat.		19. The boy is pulled by the girl.* The girl is pulled by the boy.	
20. The mother shows the kitty the baby.* The mother shows the baby the kitty.		20. The man brings the girl the boy.* The man brings the boy the girl.	
TOTAL		TOTAL	

Comments:

APPENDIX B

GRAMMATIC CLOSURE

RECORD FORM

BASAL: NONE

CEILING: SIX YEARS AND ABOVE: NONE

BELOW SIX YEARS: 6 CONSECUTIVE FAILURES

GRAMMATIC CLOSURE

SCORE

DEMONSTRATION (beds)_____

*1. (dogs)_____

2. (preposition)_____

*3. (his)_____

4. (barking)_____

*5. (dresses)_____

6. (opened)_____

7. (of, for, with)_____

*8. (John's)_____

9. (wrote)_____

10. (home)_____

11. (at night)_____

12. (painter)_____

13. (eaten)_____

14. (any)_____

15. (bigger)_____

*16. (biggest)_____

17. (men)_____

18. (planted)_____

*19. (soap)_____

20. (more)_____

*21. (most)_____

22. (feet)_____

*23. (sheep)_____

24. (better)_____

*25. (best)_____

26. (hung)_____

27. (stole)_____

28. (women)_____

*29. (himself)_____

*30. (leaves)_____

31. (children)_____

32. (mice)_____

*33. (themselves)_____

APPENDIX C

AUDITORY RECEPTION

RECORD FORM

BASAL: 5 CONSECUTIVE SUCCESSES
CEILING: 3 FAILURES IN 7 ITEMS

AUDITORY RECEPTION

SCORE

DEMONSTRATION I		
a.	**Y**	N
b.	Y	**N**
c.	Y	**N**

DEMONSTRATION II		
a.	**Y**	N
b.	Y	**N**

1.	**Y**	N	9.	Y	**N**	18.	**Y**	N	29.	**Y**	N	40.	**Y**	N
2.	Y	**N**	10.	**Y**	N	19.	Y	**N**	30.	Y	**N**	41.	**Y**	N
3.	Y	**N**	11.	**Y**	N	20.	**Y**	N	31.	**Y**	N	42.	Y	**N**
4.	**Y**	N	12.	Y	**N**	21.	Y	**N**	32.	**Y**	N	43.	**Y**	N
5.	**Y**	N	13.	**Y**	N	22.	Y	**N**	33.	Y	**N**	44.	Y	**N**
6.	Y	**N**	14.	Y	**N**	23.	**Y**	N	34.	**Y**	N	45.	**Y**	N
7.	Y	**N**	15.	Y	**N**	24.	Y	**N**	35.	Y	**N**	46.	**Y**	N
8.	**Y**	N	16.	**Y**	N	25.	**Y**	N	36.	**Y**	N	47.	Y	**N**
			17.	Y	**N**	26.	**Y**	N	37.	Y	**N**	48.	Y	**N**
						27.	Y	**N**	38.	**Y**	N	49.	**Y**	N
						28.	Y	**N**	39.	Y	**N**	50.	Y	**N**

APPENDIX D

VISUAL RECEPTION

RECORD FORM

BASAL: 3 CONSECUTIVE SUCCESSES
CEILING: 3 CONSECUTIVE FAILURES

VISUAL RECEPTION

SCORE

DEMONSTRATION I

a. 

b. 

1. 

2. 

3.

4.

5. 

6.

7. 

8.

9.

10.

DEMONSTRATION II

a.

b.

11.

12.

13.

14.

15.

16.

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