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AUTHOR Shinn, Mark R.; And Others
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ABSTRACT

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IRLD

Institute for Research on Learning Disabilities

IRLD

Director: James E. Ysseldyke

Associate Director: Phyllis K. Mirkin

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Mark R. Shinn, James Ysseldyke, Stanley Deno, and

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University of Minnesota

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Abstract

Functional measures of reading, spelling, and writing were administered weekly over a five-week period to 71 fifth grade students. Although 34 of these students had been identified as LD by their schools and 37 were low achievers who had not been identified as LD, no meaningful differences had been found between their performances on several commonly-used norm-referenced devices. Examination of the students' weekly performance on the functional measures revealed both significant and practical differences in performance on the measures of reading and spelling; no differences were found in rates of learning on these measures. Interpretation of findings on writing were inconclusive due to low reliabilities of the measure. In general, the results were in support of the hypothesis that teachers' referral decisions are based on what they observe students doing in the classroom, and that eligibility decisions following a referral may reflect a confirmatory/superstitious process. The implications of the findings for the classification of students as LD and for current practice are discussed.

A Comparison of Psychometric and Functional Differences Between Students Labeled Learning Disabled and Low Achieving

School systems and educational personnel regularly engage in practice of classifying students. On a day-to-day basis pupils are grouped more or less on the basis of chronological age (by grade) in the elementary school and by age and subject material in the secondary school. Such classification procedures infrequently have been criticized. Schools also regularly engage in the practice of classifying students according to a variety of special categories of exceptionality (i.e., mental retardation, speech handicapped, emotional disturbance, hearing impaired, and learning disability). These classification practices are intended to benefit the student so classified. This was not always the case. In education, as in the criminal justice system and in the early classification of "mental illness," the categorization of children was grounded in the ideology of exclusion and punishment. One must remember that Binet was commissioned "to find a way to locate those who could not learn so that teachers would not be charged with failure on their account" (Maurer, 1972, p. 108). Thus, while the original purpose of classification was exclusionary in nature, today schools classify primarily to provide service to the child. It is the classification of exceptionality that has come under criticism, so much so that in 1973, 28 of 50 state directors of special education identified it as the major controversy in the field (State-Federal Information Clearinghouse for Exceptional Children, 1973).

The classification of exceptionality can be broken into two distinct categories: classification by physical/objective handicap, and classification by socially-determined handicap. The classification of a student

as physically handicapped usually is straightforward. For example, in the classification of a student as blind, blindness is unique to that individual. It makes no difference where that student scores compared to others nor is it dependent upon how many other students have been identified as blind. Socially-determined handicaps create more problems for the classified since these handicaps are identified by a comparison to others. Tucker (1980) stated that current identification/classification procedures for socially-determined handicapped students are extremely problematic.

Classification problems are most evident in the process of identifying students as learning disabled. Schools currently engage in the practice of diagnosing students as learning disabled through the administration of standardized tests, using a number of techniques to assist them in their decision making. Some schools administer a wide variety of tests and apply one of a myriad of possible formulas. Others administer the devices and calculate an aptitude-achievement discrepancy. Still others examine the distribution of a student's performance on standardized tests and engage in the process of profile or scatter analysis. Some districts continue to search for particular "process" deficits no matter how they choose to define them.

A recent study provides data that bring into question the validity of such practices in differential diagnosis. Ysseldyke, Algozzine, Shinn, and McGue (1979) compared the performance of students labeled learning disabled and low-achieving students on a number of commonly used standardized assessment devices. Fifty fourth-grade children, identified as learning disabled by their school districts were compared to 49 fourth-grade children who scored below the 25th percentile on

the Iowa Test of Basic Skills. Pupil performance was contrasted on tests representative of the domains of intelligence (Weschler Intelligence Scale for Children--Revised, Woodcock-Johnson Tests of Cognitive Ability), achievement (Peabody Individual Achievement Test, subtests of the Stanford Achievement Test, Woodcock-Johnson Tests of Achievement), perceptual-motor (Bender Visual-Motor Gestalt Test, Developmental Test of Visual-Motor Integration), behavior (Peterson-Quay Behavior Problem Checklist), and self-concept (Piers-Harris Self-Concept Scale). In addition, demographic information regarding subjects' sex, age, parental occupation, education, and socioeconomic status was collected. The data provided by Ysseldyke et al. (1979) revealed no significant differences on demographic information. And, while there were statistically significant differences on some of the measures, most notably in the domain of achievement, the authors reported that these differences lacked practical significance. For example, when comparing the groups on the Quantitative Concepts subtest of the Woodcock-Johnson Test of Cognitive Ability, the difference between their mean scores was significant ($p < .05$); yet, there was only a 1.26 point difference between the means. Thus, on the average, the performance of the low-achieving group exceeded that of the LD group by just over one math problem correct.

Ysseldyke et al. (1979) then analyzed their data according to the number of "identical scores." If a subject in the LD group had the same score as a subject in the low-achieving group, then the scores were defined as identical. With the number of possible identical pairs being 49, the number of identical scores ranged from 23 to 44. In only two cases were the number of identical scores less than 25. This means that

in most instances at least half of the members of both groups had the same scores.

Ysseldyke et al. (1979) also conducted two analyses to determine how many students would be classified correctly if the federal definition was operationalized using a deficit in achievement of either 1.0 standard deviation or 1.5 standard deviation below average. Using a 1.0 standard deviation deficit, 40 of 99 students were misclassified. Using a 1.5 standard deviation deficit, 40 of 99 students were misclassified, with many formerly classified as LD by the school and by the 1.0 standard deviation definition not meeting this criterion.

In summary, Ysseldyke et al. could find no important psychometric differences between the two groups even though federal and state laws mandate that they must be differentially diagnosed. Indeed, if the Federal definition is operationalized, considerable misclassification occurs when decisions are based on test scores from commonly used psychometric devices.

A number of benefits are associated with classification. However, numerous negative effects exist as well. It is apparent that some of the children in the Ysseldyke et al. study were declared eligible while others, wrongly or rightly, were not. Although it appears to be current practice, classification decisions should not be made on the basis of limited behavior samples from testing conducted outside the classroom on a "one-shot" basis.

The present study examined the utility of an alternative approach to current practices by further investigating the validity of the schools' classifications of students as learning disabled. Functional measures of student classroom performance in the areas of reading, spelling, and

written expression, developed at the University of Minnesota Institute for Research on Learning Disabilities (Deno, Mirkin, Chiang, & Lowry, 1980; Deno, Mirkin, Lowry, & Kuehnle, 1980; Deno, Mirkin, & Marston, 1980) were used.

Deno, Mirkin, and their associates identified critical behaviors that validly indexed achievement in reading, spelling, and written expression. A number of criteria in addition to concurrent validity were used in the selection of these critical behaviors, including (a) sensitivity to small adjustments in instructional methods and materials and motivational techniques, (b) easy administration, (c) many parallel forms, (d) time efficiency, and (e) unobtrusiveness. Based upon research, the following were identified as valid measures of achievement:

Reading: Having a student read aloud for one minute, scoring the words read correctly and incorrectly.

Spelling: Having the student write words dictated orally for three minutes, scoring the number of words spelled correctly.

Written Expression: Having the student write a story for three minutes, scoring the number of total words written.

In the present study, these measures were administered to LD and low-achieving students once a week for five weeks to answer the following questions:

(1) Do students receiving LD services perform more poorly than low-achieving students?

(2) Do students receiving LD services show less gain over five weeks than low-achieving students?

(3) Is the rate of learning less for students receiving LD services than for low-achieving students?

Method

Subjects

Subjects were a subset of metropolitan area students originally participating in a study examining differences in performance on commonly used, norm-referenced tests (Ysseldyke et al., 1979). Learning disabled students (n=34) were identified according to district placement team criteria in accord with PL 94-142, while low-achieving students (n=37) were identified according to a performance criterion of 25th percentile or below on the Iowa Test of Basic Skills in math, reading, or the composite total score. The two groups did not differ on several demographic variables, including age, sex, parents' education, marital status, and socioeconomic status.

Procedures

Following comprehensive training in the administration of the academic measures, special education resource teachers in the students' schools served as examiners. The examiners were given the measurement materials and administration directions for each of the three content areas. Four alternate forms were developed for administration on a weekly basis in each area, with the same materials being used in week 1 and week 5.

Materials

Stimulus materials for reading were isolated word lists developed by randomly selecting words from Basic Elementary Reading Vocabularies

(Harris & Jacobson, 1972), a compilation of words appearing across seven different basal readers. Each list included words from pre-primer through third grade. The examiners were provided with two copies of each list, one from which the student read and a teacher copy to use for scoring.

In spelling, word lists were drawn from the same domain as for reading. For homonyms, a sentence using the word in context was provided next to the word; the teacher read this sentence aloud following presentation of the word. In addition, a sheet with numbered lines was provided for the student.

The materials for written expression consisted of lined paper with a topic sentence typed across the top.

Administration

Examiners assessed each student individually, on a weekly basis, for five weeks. Testing took place in the same sequence each week, with one minute of reading followed by three minutes of spelling, and then three minutes of written expression.

Isolated word recognition. The following instructions were given to the student before the reading test:

> Here is a word list that I want you to read. When I tell you to start you can read across the page. Use the cardboard to help you keep your place. Please read as fast and accurately as you can. If you get stuck on any of the words, move on to the next one. If you finish all of the words on the front side, turn the sheet over and continue reading. I will tell you when to stop reading. Are there any questions? Ready? Begin.

As the student read, the teacher kept track of performance on the follow-along sheet, with only exactly accurate responses counted as correct.

Substitutions, omissions, and mispronunciations were counted as incorrect and crossed out (X) on the teacher's copy. Repetitions were not counted as errors. The teacher made a slash (/) after the last word the student read at the end of one minute.

Spelling. The following instructions were given to the student prior to the spelling test:

> I am going to ask you to spell some words today. Each time I want you to do your best and work quickly. Do not work too fast because it is important that you spell the words correctly. I will read a word to you and repeat (or say it again) just once. Do not ask me to repeat the words. If you cannot spell a word, we will go on to the next word. Sometimes words can be spelled in more than one way. I will say those words in short sentences so that you will know which word I want you to spell. An example is the word right - write. If I wanted you to spell r-i-g-h-t, I would say the word, then say -- His answer was right, and repeat the word. If you spelled w-r-i-t-e, it would be marked wrong. There are only a few words on my lists that can be spelled more than one way; but listen carefully to the sentences I give for them. Any questions? Remember to work quickly, but do the best that you can. You may print or write the words, but try to do it neatly so that I can read the words you spelled later on.

A maximum of 15 seconds was allowed for the spelling of each word, prior to presenting the next word. If the student completed a word in less than 15 seconds, the next word was dictated immediately.

Written expression. The following instructions were given to the student prior to the written expression test:

> Today I want you to write a story. I am going to read a sentence to you first, and then I want you to compose a short story about what happens. You will have no more than one minute to think about the story you will write and then have three minutes to write it. When I say 'go,' start writing.

Scoring

The dependent data for each of the academic measures were scored as follows:

Word recognition: number of words read correct and incorrect

Spelling: number of words spelled correct and incorrect

number of correct and incorrect letter sequences

Written expression: number of words written

number of words spelled correct

number of correct letter sequences

Based on previous research that indicated that the total number of words read or spelled correct or written were valid and sensitive measures of reading, spelling, and writing, respectively (Deno, Mirkin, Chiang, & Lowry, 1980; Deno, Mirkin, Lowry, & Kuehnle, 1980; Deno, Mirkin, & Marston, 1980), these served as the primary units of measurement in the analyses of data.

Results

Several analyses were conducted to compare the performance of the LD and low-achieving groups of students. First, an overall test of significance on performance across all the measures was conducted to determine (a) overall differences between the two groups, and (b) the accuracy of predicting group membership. Second, differences between the groups within each of the three measured content areas were analyzed in terms of: (a) "level" of performance, (b) "slope" of performance, and (c) absolute growth. A third analysis involved computing the test-retest and alternate-form reliability of each measure.

To determine the extent to which overall differences existed between the two groups, a canonical discriminant function was run using all the measures and critical behaviors. Additionally, the results of the

canonical discriminant function were used to match the function's classification as learning disabled (LD) or non-learning disabled (NLD) with each student's actual classification. The results are presented in Tables 1 and 2. As shown in Table 1, a high relationship (.87) existed between the groups' performances on the measures and their classification by the discriminant function. The accompanying Chi-Square analysis using the discriminant function revealed that the overall performance of the LD and NLD groups differed significantly ($X^2 = 49.53$, $p = .002$). The results of the discriminant function's classification of students as LD or NLD appear in Table 2. One case was deleted from this analysis due to missing data. For the remaining 70 students, 62 (88.57%) were classified correctly.

Insert Tables 1 and 2 about here

Comparison of the two groups on the reading measure of words read correct appears in Table 3. A week-by-week comparison of LD and NLD performance indicates that each week the NLD group significantly outperformed the LD group in the number of words correctly read. The differences between the groups ranged from 23.6 to 26.1 words per minute. Similar results were obtained for words read incorrectly and for accuracy. In contrast, there were no significant differences between the two groups with respect to the slope of their reading scores ($p = .37$). On the average, the scores of the LD group increased at the rate of 1.74 words per week, while the NLD group's mean slope was 2.35 words per week. Finally, a pre-post analysis of absolute growth, in which

identical week 1 and week 5 measures were used, no statistically significant differences were found between the two groups. Both groups showed gains in the number of words read correctly on the original measure over the five-week period. The LD group gained 6.9 words and the NLD group gained 9.4 words.

Insert Table 3 about here

Table 4 compares the LD and NLD samples on the number of words spelled correctly during the three-minute timing. Again, the NLD students consistently spelled significantly more words correctly than did students receiving learning disabilities services. While the variance of the groups as represented by the standard deviation was about the same on a week-by-week basis, the NLD group maintained a 6.7 to 8.6 words correct advantage over the LD group. The same results were found when the dependent measure was number of correct letter sequences, number of words spelled incorrectly, or accuracy of spelling, with NLD students performing significantly better than LD students each week.

Insert Table 4 about here

While the two groups differed in terms of the number of words spelled correctly, again no statistically significant difference was obtained between the groups in terms of absolute growth (rate of increase per week). The performance of both groups increased by an average of about one-half word per week (LD = .52 words, NLD = .64 words, $p = .62$). These results parallel those obtained for reading. Finally, a comparison

of pre-post gain as measured by the administration of the same measure on weeks 1 and 5, indicated that the LD group averaged a gain of about 3.0 words spelled correctly over the five-week period, compared to the NLD group's average gain of 4.2 words. These averages were not significantly different (t = 1.12, p = .268), demonstrating that both groups made similar amounts of progress.

Unlike the data obtained from the other measures, the data from the written expression measures failed to uphold the pattern of superior performance by the low-achieving (NLD) group. As shown in Table 5, the NLD group wrote significantly more words (43.9) than the LD group (37.6) in the three-minute timing during week 1 (F = 2.04, p = .045). However, no significant differences were found between the two groups in the total number of words written during each of the remaining weeks. In fact, during week 4, the LD group slightly outperformed the NLD group. Similar results were obtained when analyses were conducted on the number of words spelled correctly and the number of correctly written letter sequences.

Insert Table 5 about here

When a measure of spelling accuracy on the written expression task was examined, the performance levels of the two groups were significantly different. Data on the groups' accuracies in spelling words correctly on the written measures are reported in Table 6. Three major conclusions can be drawn from the data. First, the NLD sample spelled significantly more accurately than the LD group on four of the five weekly measures. Second, the accuracies in spelling on the written expression measure were much higher than those on the spelling measures. Generally speaking,

both groups were accurate spellers when writing. Third, the only non-significant result occurred on the week 4 data.

Insert Table 6 about here

The learning rates (slopes) of the LD and NLD groups on the written expression measures (see Table 5) were inconsistent with those in the other two measurement areas. While there were no differences in slope for reading and spelling over five weeks, in writing the LD group gained an average of one word per week (1.04) while the NLD group lost an average of one-half word per week (-.53). This difference in rate of change was significant (p = .017). The difference between the two groups over time also was reflected in the pre-post testing conducted on weeks 1 and 5 (see Table 5). The probability associated with the difference in absolute growth approached conventional statistical significance (p = .058), with the LD group outperforming their low-achieving peers at an average rate of 5.1 versus 0.5 words growth on the same measure over five weeks.

Test Reliability

Reliability estimates for the three academic measures appear in Table 7. For reading, both test-retest (.90) and alternate-form (median = .91) estimates of reliability indicated that the reading measures were very reliable. For spelling, test-retest (.85) and alternate-form (median = .85) reliability estimates were generally quite high, ranging from .82 to .92. In contrast, the estimates of the reliabilities for the written expression measures were substantially lower. Generally, the reliability estimates were moderate for total words written (test-retest = .69; alternate-forms median = .59). The range of alternate-

form reliabilities ranged from .51 to .71.

Insert Table 7 about here

Score Distributions

The distribution of individual scores on the week 1 reading measure shown in Figure 1 is typical of the distributions of scores obtained on the measures. Clearly, two separate distributions were present. Using a score of 52 words correct as a possible cut-off score, only two NLD students fall below as compared with 19 LD students. At the other extreme, using 80 words read correctly as a cut-off, only four LD students read above that level as compared with 21 NLD students. Figures 2 and 3 display similar results from the week 1 spelling and written expression measures.

Insert Figures 1-3 about here

Discussion

The results of this study suggest that differences exist in the reading and spelling skills of students receiving learning disabilities services and students identified as "low achievers." It also appears that two of the measures show considerable promise for differential diagnosis of students on an individual basis. Both the reading and spelling measures were highly reliable and, given possible attenuation effects due to the restricted range of the populations, appear to meet the standards suggested as necessary for technical adequacy (Salvia & Ysseldyke, 1978). The measures of written expression showed less

promise in this study; however, the low reliabilities reported here contrast with the high reliabilities reported in other studies (Marston & Deno, 1981).

Consistent differences between the two groups of students were found in reading in terms of the number of words read correctly. As a group, the learning disabled students read at a rate that was approximately 50% less fluent than their low-achieving peers. This relationship was consistent across weeks. The differences between the groups are evidenced further in an analysis of the distribution of individual scores. As mentioned earlier, the scores of the two groups produce very different distributions. In contrast to the measures of overlap reported by Ysseldyke et al. (1979), the groups overlapped much less on the reading measures used in the current study.

In examining performance in spelling, again the LD sample performed at an average that was 50% less fluent than that of the low achievers.

Interpretation of the results of the written expression measure is problematic. While the low-achieving sample significantly outperformed the learning disabled sample when the number of words spelled correctly was analyzed, there were no significant differences between the two groups during four of the five weeks when the total number of words written was analyzed. Interpretation of this finding is complicated by the moderate reliabilities that characterized the measures. Further study needs to be made of the reliability of measures of written expression, particularly when they are administered on a weekly basis.

In contrast to the substantial differences in the levels of performance in reading and spelling, the learning slope of the two groups

were not very different. This is in contrast to results reported by Kunzelmann (1977), who has argued that special populations can be differentiated from normal populations based on their learning rates. In the present study, improvement occurred for both groups on the measures of reading and spelling. However, in assessing written expression, the LD sample improved at a much greater rate than did the NLD group. In fact, the slope for the NLD group was negative. A number of factors could account for these differences. Two possible explanations are (a) the unreliability of the measures, and (b) the relative unimportance placed upon written expression in learning disabilities programs. The practice provided by the measurement, in an area where there has been little or no practice, may have accounted for the positive slope.

The results of this study lead to three complex questions. First, why do the LD and NLD students differ on these measures but not on more traditional standardized tests? Second, according to this study, who is being served in learning disabilities programs? Third, on what basis are referrals for learning disabilities being made?

Ysseldyke et al. (1979) found very few differences of practical significance in measuring these same students using traditional standardized devices. Yet, one can conclude from the results of this study that differences do exist between the populations and that these differences may be of value in differential diagnosis and eligibility. What is it about the two measurement systems that can account for these differences? In a global manner, perhaps these differences can be attributed to the distinction between indirect and direct measurement. Lovitt (1978) argues that most standardized tests are indirect measures

This statement is certainly applicable to the less achievement-oriented measures, i.e., the "cognitive" or "perceptual" measures such as the WISC-R, the Woodcock-Johnson Tests of Cognitive Abilities, and the Bender, that were administered in the Ysseldyke et al. study. These measures were designed to measure a process construct and as an operationalization of that process, they are indirect. The measures in the present study are direct measures of skill areas that are the focus of instruction; they sample students' performance in a manner similar to that which occurs in the classroom. Because many of the indirect measures may be related to academic performance in a correlational but not causative manner, they may be unimportant.

Importantly, the measures used in this study include more items than the traditional achievement tests. For example, the Woodcock-Johnson Achievement Battery Letter-Word Identification subtest allows the student to read 47 words at most. Not only is the number of items limited, but the items span a great difficulty range, starting at "is" and reaching such words as "puisne," "tricot," "kopje," and "pinochle." By contrast, the words on the reading measure used in this study allow a student to read up to 140 words, all from approximately the same level of difficulty. This allows for more complete and representative sampling of the students' skills and more opportunities for correct responses. The measurement system is more sensitive to inter-individual differences and can more adequately differentiate between students of various proficiencies in a manner that has practical utility. The importance of this factor can be seen in an examination of Ysseldyke et al.'s subjects on the Letter-Word Identification subtest: while low-achieving students performed significantly better on that subtest

($p < .05$), the magnitude of the differences between the means (3.96 words) and the small variances (NLD = 2.98, LD = 3.82) did not allow for the differences to be of practical use.

The measures used in this study also varied on another critical dimension, that of fluency or rate of behavior. Not only was how many words the student read or spelled per se important but also how quickly the student could do so in a given period of time. The achievement measures used by Ysseldyke et al. excluded fluency. Two students could get the same number correct with one student taking two minutes to read 10 words and another taking three minutes. Regardless of one's theoretical perspective, fluency or rate of responding is more sensitive as a dependent measure than number correct or percentage of accuracy.

Skinner (1953) argues that rate of responding is the only variable really worth measuring. Rate of responding is also critical in White and Haring's (1980) learning hierarchy. They maintain that in the development of any skill, the learner goes through five major steps. Acquisition, the first stage, emphasizes the accurate performance of a skill (i.e., mastering the essential components of the skill). Fluency building, the second step, emphasizes the addition of speed to accuracy. To read extremely slowly but accurately is not productive in academics. Thus for mastery of most material, fluency is important. The other stages of behavior, maintenance, application, and adaptation all emphasize the importance of having a particular behavior occur at some minimum rate before the methods of instruction appropriate for those stages are effective.

The importance of skill fluency and rate of responding are being

identified by others as well. For example, in reading, slow readers are poorer in comprehension (Carnine & Silbert, 1979). These authors hypothesize that non-fluent readers read so slowly that they cannot remember what they have read; thus, comprehension suffers. Similar findings have been reported by Pace and Golinkoff (1976), Speer and Lamb (1976), and Perfetti and Hogalboam (1975). Dahl (1979) and Waechter (1972) found that when students' reading rates improved, their comprehension improved. LaBerge and Samuels (1976), in their information processing model, substitute the concept of automaticity for fluency. They argue that a reader must read words quickly enough for attention to be given to the organization of the word meanings represented by the sentence.

The concept of fluency is important in spelling and writing as well. Extremely slow spellers and writers will have a difficult time in school. The assessment of fluency should thus be considered to be an essential, unique component of the measurement devices used in this study.

Given these differences in the two measurement systems, what are the implications for who receives LD services and how the referral is taking place? Students may be receiving learning disabilities services on the basis of their being "at the bottom of the barrel" in terms of academic achievement. The results of Ysseldyke et al. (1979) suggested that there were no clear-cut "psychological" correlates of receiving LD services. This study, however, demonstrated academic performance differences in reading and spelling skills between students receiving services and those not receiving services. As a group, those receiving services perform lower than other students. These findings are at odds with the beliefs of many of the professionals in the field, who would

suggest that some underlying cause or something wrong with the student exists.

What we may be witnessing is a teacher referring a particular student because the student does not read, write, spell, or compute as well as the others in the class. There are no physical explanations, such as hearing or vision, for this poor performance. As a result of this referral, a placement team begins to substantiate the teacher's opinion. This is accomplished in most cases by the administration of a large number of tests. The process can be time consuming and expensive. The outcome of the testing, according to Ysseldyke et al., fails to substantiate or differentiate the student from others who may be doing poorly. The failure of standardized tests leaves the placement decision open to a number of other factors such as parental opinion and power, the influence of the teacher, logistical variables (e.g., the number of openings in a program, or the program site), and superstition (e.g., "he looks LD," "his brother's LD," etc.).

It is important to note that the alternative to this process is not simply a reliance upon teacher judgment. The measures used in this study, primarily the reading and spelling measures, lend themselves as a remedy to this situation. They allow for the efficient, expedient quantification of what a teacher sees in the classroom as the basis for selection for learning disabilities services. The procedures have documented reliability and validity. Because they are not time consuming, additional data can be collected for "average" students in the classroom, school, or district, thus allowing eligibility to be determined by inter-individual student discrepancies in academics based on local averages

in contrast to defining and operationalizing the intra-individual aptitude-achievement discrepancy.

For the most part, the ramifications of such an eligibility system remain uninvestigated. Certainly, the eligibility decision could be made in a less expensive manner and as a result, more attention (i.e., time and money) could be spent investigating remediable student weaknesses, determining appropriate instruction, and evaluating the effectiveness of such instruction. Would such procedures result in better decisions? Ysseldyke et. al. (1979) suggested that the schools' decision-making processes, based upon the tests administered, did not result in "good" decisions. In fact, they argued that similar decisions could have been made by flipping a coin. However, given the data from this study, it appears that the schools did adequately differentiate between the two populations. Of course, one can only speculate as to what factors actually influenced the decisions by the schools. The contribution of comprehensive standardized test data, however, had to be minimal.

Several questions must be raised about the use an alternative method for making eligibility decisions. For example, how discrepant must the target student be from his peers? Deno and Mirkin (1977) have suggested a 2.0 discrepancy (the target student perform at half the rate of the average student). It should be noted that this suggestion has no empirical basis as of yet. No one knows how many students would be identified as eligible if a 1.5, 2.0, or 3.0 discrepancy was used. A related question is who should constitute a peer group? Should it be a particular class, school, or the whole district? Another important consideration is how educational professionals would react to such a

method for making decisions. Further, one must ask whether it would save time and allow for the better allocation of specialized services.

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Footnote

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Table 1.

Results of the Canonical Discriminant Function Using All Measures for LD and NLD Students

	Function 1	Percent of Variance	Canonical Correlation	Chi-squared	D.F.	f
LD	-1.25					
		100	.77	49.53	25	.002
NLD	1.12					

Table 2

Classification of Students as Learning Disabled and Non-Learning Disabled Using Actual Classification and Discriminant Function

Actual Group	Predicted Group Using Discriminant Function	
	LD	NLD
LD (33)	29	4
NLD (37)	4	33

Percent Correctly Classified = 88.57

Table 3

Comparison of Number of Words Read Correctly Using the Reading Measure for LD and Low Achieving Students

	Group	$\bar{X}$	SD	p
Week 1	LD	49.4	21.5	.000
	NLD	73.0	18.8	
Week 2	LD	46.6	21.5	.000
	NLD	68.2	19.4	
Week 3	LD	48.7	22.4	.000
	NLD	72.5	20.9	
Week 4	LD	48.7	20.2	.000
	NLD	72.9	19.9	
Week 5	LD	56.3	21.2	.000
	NLD	82.4	21.0	
Slope of Performance Week 1 to Week 5	LD	1.74	2.57	.370
	NLD	2.35	3.11	
Absolute growth Week 1 to Week 5	LD	6.9	8.7	.328
	NLD	9.4	12.2	

Table 4

Comparison of the Number of Words Spelled Correctly Using the Spelling Measure for LD and Low Achieving Students

	Group	$\bar{X}$	SD	p
Week 1	LD	15.6	4.8	.000
	NLD	23.0	4.9	
Week 2	LD	15.7	6.7	.000
	NLD	23.0	6.0	
Week 3	LD	13.1	7.4	.000
	NLD	21.2	7.5	
Week 4	LD	14.4	7.3	.000
	NLD	21.1	7.2	
Week 5	LD	18.6	6.9	.000
	NLD	27.2	7.3	
Slope of Performance Week 1 to Week 5	LD	.52	1.01	.620
	NLD	.64	1.12	
Absolute growth Week 1 to Week 5	LD	3.0	4.2	.268
	NLD	4.2	4.7	

Table 5

Comparison of Weekly Number of Words Written Using the Written Expression Measure for Learning Disabled and Low Achieving Students

	Group	$\bar{X}$	SD	p
Week 1	LD	37.6	13.6	.045
	NLD	43.9	12.6	
Week 2	LD	38.8	11.8	.293
	NLD	42.0	13.1	
Week 3	LD	39.6	10.5	.070
	NLD	45.2	14.5	
Week 4	LD	37.8	13.0	.692
	NLD	36.6	12.3	
Week 5	LD	42.7	14.4	.714
	NLD	44.0	14.5	
Slope of Performance Week 1 to Week 5	LD	1.04	2.56	.017
	NLD	-.53	2.80	
Absolute growth Week 1 to Week 5	LD	5.1	9.0	.058
	NLD	.5	11.0	

Table 6

Comparison of Accuracy in Spelling Words in a Written Expression Task for Learning Disabled Low Achieving Students

	Group	$\bar{X}$	SD	p
Week 1	LD	.81	.10	.000
	NLD	.90	.06	
Week 2	LD	.82	.17	.007
	NLD	.90	.06	
Week 3	LD	.84	.16	.010
	NLD	.92	.06	
Week 4	LD	.86	.09	.200
	NLD	.88	.09	
Week 5	LD	.84	.09	.000
	NLD	.92	.07	

Table 7

Reliability Estimates of the Weekly Measures in Three Academic Areas

	Week 1	Week 2	Week 3	Week 4	Week 5
A. Total Words Read					
Week 1	--				
Week 2	.92				
Week 3	.89	.92	--		
Week 4	.90	.90	.92	--	
Week 5	.90	.90	.91	.94	--
B. Total Words Spelled Correct					
Week 1	--				
Week 2	.85	--			
Week 3	.83	.89	--		
Week 4	.82	.88	.92	--	
Week 5	.85	.84	.86	.85	--
C. Total Words Written					
Week 1	--				
Week 2	.70	--			
Week 3	.58	.68	--		
Week 4	.51	.56	.57	--	
Week 5	.69	.71	.59		--

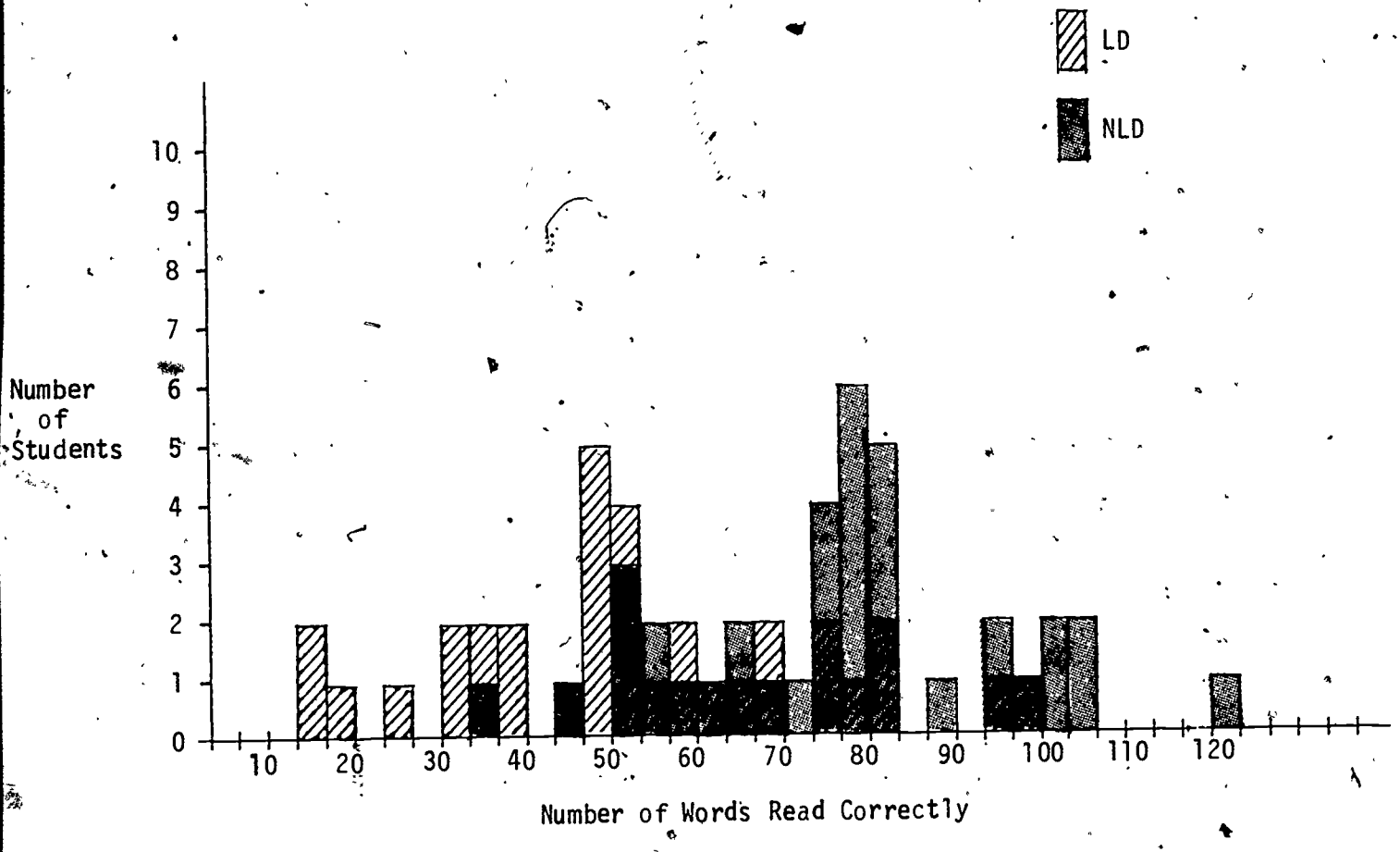

Figure 1. Comparison of Week 1 Reading Measure for Learning Disabled and Low Achieving Students

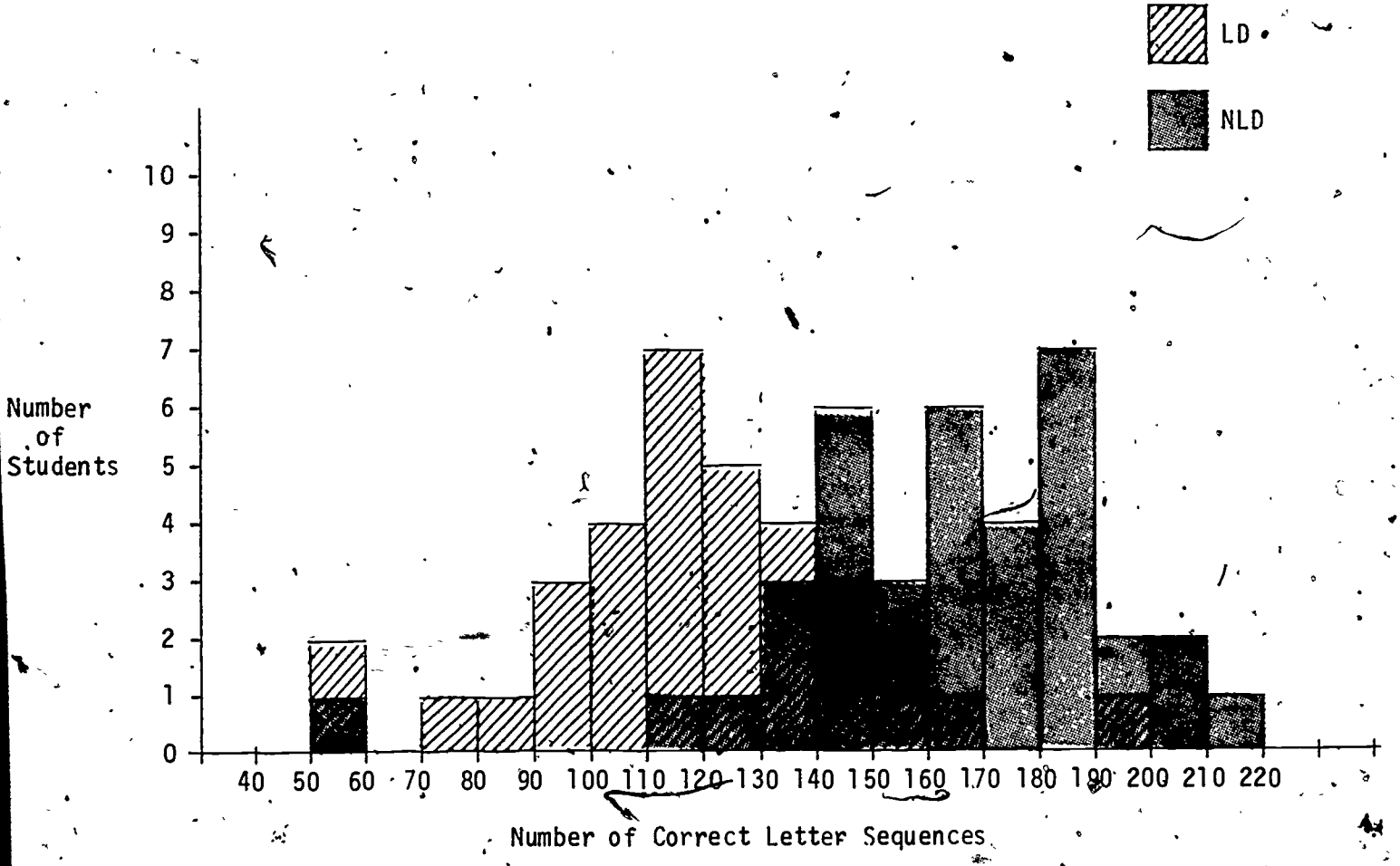

Figure 2. Comparison of Week 1 Spelling Measure for Learning Disabled and Low Achieving Students

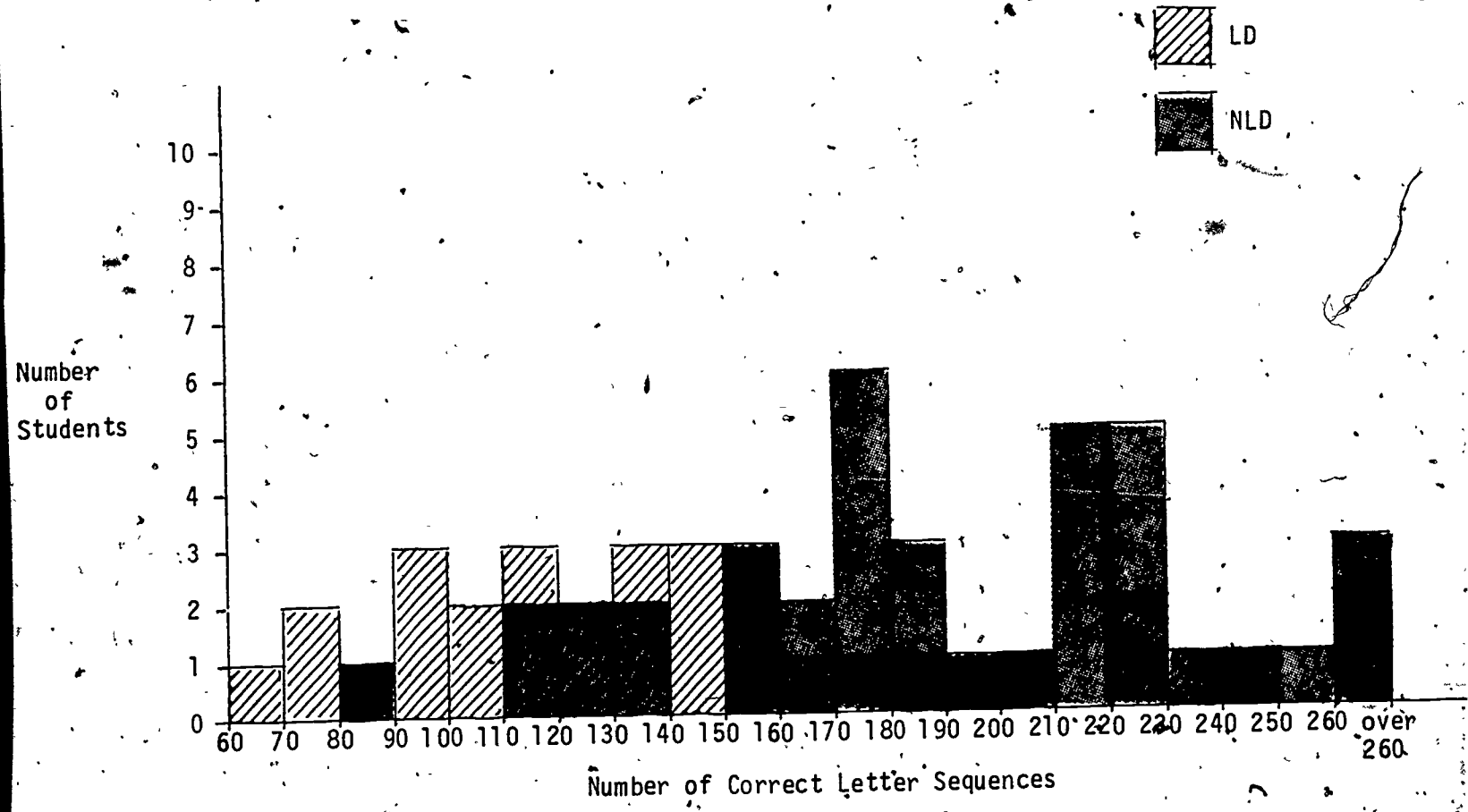

Figure 3. Comparison of Week 1 Written Expression Measure for Learning Disabled and Low Achieving Students

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