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LAKEHEAD UNIVERSITY


READING DISABILITY:  a look at poor
readers' WISC-R profile scores
as suggested by Dr. S. Truch


by

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A THESIS

SUBMITTED TO THE FACULTY OF ARTS

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTER OF ARTS


DEPARTMENT OF PSYCHOLOGY

THUNDER BAY, ONTARIO, CANADA

MARCH 1996

0-612-33334-5

Canada

## ABSTRACT

One of the biggest dilemmas facing the educator to-day is how best to teach students who are poor readers, to read. Many students to-day possess average or above average intellectual ability, yet cannot read at the level of their potential. Dr. Truch (1991) noted in his clinical practice that there exists a group of students, identifiable through their individual WISC-R profile, who are not reading at a level compatible with their intellectual potential. This study is intended to investigate Truch's notion of the relationship between students who are experiencing difficulty with reading and their individual WISC-R Verbal subtest profiles. He hypothesized that those students with average or better intellect and are weak in reading as determined by their WRAT-R scores will have lower scores on the Information, Arithmetic and Digit Span (AID) subtests as compared to rest of their Verbal subtest scores (CVS). The WRAT-R and WISC-R were administered to 351 students who were then divided into two groups, No Reading Problems (NRP) and Reading Problems (RP). The results failed to confirm Dr. S. Truch's hypothesis that the AID scores of the RP group would be significantly lower than that of the NRP group as there was no significant difference between the 2 groups.

## ACKNOWLEDGEMENTS

The author would like to thank the following for their assistance, guidance and encouragement.

Dr E. Bauman for his assistance and guidance through my MA years.

Dr. W. T. Melnyk for his encouragement to get my thesis completed.

Linda DeSousa for her assistance with the SPSS for Windows program.

Carole, Vanessa and Trevor Aitken, my immediate family. I thank them for their continued support during the duration of my thesis.

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## Introduction

The question of "Why Johnny Can't Read" was first raised in 1955. In his controversial book, Rudolph Flesh (1955) sowed the first seeds of the great debate that still rages on as to the best method of reading instruction for poor readers? This debate is still a long way from being resolved. For the students who cannot read, their parents and educators it is also one of the greatest areas of frustration in education today.

"The question of how best to teach

beginning reading may be the most politicized

topic in the field of education. One reason

is that we all care passionately about the

success of beginning reading instruction. It

is the key to education, and education is the

key to success for both individuals and a

democratic society." (Adams, 1990, p. 1).

It is this passionate concern that initiates the psycho-educational investigation of a child's lack of reading ability early in their academic career. Students with a suspected reading disability are usually referred to the school's special education personnel for assessment. This assessment will usually commence with a standardized reading

appraisal to determine the severity of the suspected disability. Should there be evidence of a disability the investigation will continue with an intellectual assessment. The results of the intellectual component will generate further hypotheses to be scrutinized. The culmination of the investigation will result in a report of the findings that will include recommendations as how best to meet the specific child's needs. The range of the reading disablity can be from those who are experiencing some difficulty, to those who are considered reading disabled to those who are formally identified as being learning disabled due to the severity of their reading disability. What insights do the intellectual tests offer about the nature of specific reading disabilities? How appropriate are the remediation recommendations?

To-day the most commonly used instrument is one of the Wechsler Intellectual tests. The series of intelligence tests, the Wechsler Intelligence Scale for Children - Revised (Weschsler, 1974), or the Wechsler Intelligence Scale for Children - Third Edition (Wechsler, 1991), Wechsler Preschool and Primary Scale of Intelligence - revised (Wechsler, 1989) and Wechsler Adult Intelligence Scale - Revised (Wechsler, 1981), were designed to measure a person's intelligence. Wechsler defined intelligence as:

"*The aggregate or global capacity of the*

*individual to act purposefully, to think*

*rationally and to deal effectively with his*

*environment." (Wechsler, 1958, p.7).*

During the design of these instruments Wechsler
selected his subtests guided by his focus on the global
nature of intelligence. These scales were to reflect the
factors he posited as contributors to the total effective
intelligence of the individual. However,

*"no attempt was made to design a series of*

*subtests to measure 'primary abilities' nor*

*to order the subtest into a hierarchy of*

*relative importance." (Sattler, 1990, p. 43-*

*44).*

Due to its well-researched psychometric properties the
WISC-R evolved as the instrument of choice in assessing the
cognitive development of school aged children. As
clinicians became more fluent in the interpretation of the
WISC-R, different techniques were tried to make more
accurate assessments of individuals. One such technique
called 'scatter analysis' (Sattler, 1990) or 'profile
analysis', (Hale & Saxe, 1983), or 'subtest performance
patterns', (Muller, Matheson, & Short, 1983) has been
debated as a valuable technique available to the psycho-
educational clinician in attempting to analyze a student's
WISC-R protocol. There are seven methods of profile

analysis. They range from, simply comparing the VIQ to the PIQ, to comparing set of individual subtest scores, to comparing the subtest scaled scores in each factor with their respective mean factor scores. As this technique evolved it was hoped that it would increase the diagnostic precision of interpretation. The goal of subtest interpretations is to describe each child's unique ability pattern, thereby identifying each child's areas of strength and/or weakness in order to assist educational programmers in utilizing the child's own strength to offset his or her weakness (Sattler, 1990). However, two distinct groups of thought developed; those who do not support the interpretive use of subtest profiles and those who do support such use of subtest profiles.

Opponents of Subtest Profiles

Bannatyne (1974) attempted to recategorize the subtests as a tool to assist with the identification of learning disabled students. The WISC was broken into four factors:

1. The Spatial Factor consists of scores from the Picture Completion, Block Design, and Object Assembly subtests.

2. The Conceptual Factor consists of scores from the Comprehension, Similarities, and Vocabulary subtests.

3. The Sequential Factor consists of the scores from the Digit Span, and Coding subtests.

4. The Acquired Knowledge factor consists of the scores from Information, Arithmetic, and Vocabulary.

*"Bannatyne's recategorization was based on an inspection of the subtests, not on factor analytic findings. It is simply a heuristic model designed to aid in test interpretation. The pattern proposed to be characteristic of learning disability is Spatial > Conceptual > Sequential."* (Sattler, 1990, p. 609.)

The diagnostic implications of Bannatyne's recategorization of the WISC-R scores was challenged by Henry and Wittman, (1976) when they concluded that nearly half of the learning disabled subjects failed to present the classic Spatial > Conceptual > Sequential pattern. They caution against the profile analysis as a diagnostic tool as it may contribute to misdiagnosis. In an extensive meta-analytic study of 94 previous studies Kavale and Forness (1984), concluded that no significant difference existed between normal students and the learning disabled group when their recategorization, profile, factor cluster or patterns were analyzed.

While profile analysis has found differential patterns that are statistically significant, Hale and Saxe (1983) claim that they are not clinically significant and therefore, not useful from a clinical point of view. They also conclude that knowledge of a child's subtest profile

does not assist the clinician in improving the prediction of achievement and, therefore, the use of subtest profiles for academic placement is unjustifiable.

Humphries and Bone, (1993) also found little difference between learning disabled students with a Low Verbal-High Performance pattern and Slow Learners with uniformly low VIQ and PIQ scores.

The argument continues in a similar yet stronger vein when some researchers criticize the notion of even using a person's IQ to determine achievement potential. Share, McGee, and Silva (1987) conclude that poor readers with high IQ's are no more remedial than poor readers with low IQ's. Siegel (1992) also shares this opinion and feels that IQ scores cannot differentiate between the poor reader and the dyslexic one.

As the research into subtest profiles developed, the tendency was to depart from the individual's profile and concentrate on group profiles. Suggestions have been made that various groups exhibited different patterns. These groups are quite diverse and can comprise, the learning disabled, the delinquent, the intellectually superior, the neurologically impaired and various ethnic or minority groups. However, research into this area has proven to be less than fruitful as no clear picture of cognitive differences between such groups has been found (Sattler,

1990). Some researchers have gone as far as to suggest a moratorium on research aimed at discovering characteristic WISC-R profiles for specific populations (Mueller, Matheson, & Short, 1983).

Proponents of Profiles

Despite the negative implications mentioned above there exists an abundant amount of research that supports the usefulness of WISC-R profile analysis. A re-analysis of the meta-analysis of Kavale and Forness (1984), actually found a pattern that distinguished learning disabled students from normal students. This meta-analysis utilized a learning disability index (LDI), which was calculated using a principal-component analysis, and was able to discriminate between LD children and the normal population (Inglis, & Lawson 1987; Lawson, & Inglis 1987; ).

Bannatyne's recategorization which suggests that disabled readers will endorse the classic Spatial > Conceptual > Sequential subtest profile was found to exist in 25 studies (Rugel, 1974). Rugel suggested that the deficit in the Sequential factor is accounted for by short-term memory and attentional processes. This same pattern has been found in research as a valuable tool in differentiating groups of normal readers from reading disabled children (Decker,& Corley 1986; Ho, Gilger, & Decker 1988; Reynolds, 1976; and Stoiber, Bracken, & Gissal,

1983).

The complexity of differential diagnosis of reading disabilities and the identification of the best predictors are discussed by Kerns and Decker (1985). The discriminant function analysis Kerns and Decker employed identified the WISC-R Information and Digit Span subtests as two of the five measures that best differentiate reading-disabled from normal control readers. The other predictors were, the Colorado Perceptual Speed Test, the Colorado Expressive Fluency Test, and family histories of reading-disabilities.

Six types of WISC-R, LD profiles were detected in 106 learning disabled students by Holcomb, Hardesty, Adams and Ponder (1987). Two of the profiles are similar to those already mentioned in the literature and display possible reading, attention, and sequencing deficits. Of these two profiles, the first had a difference between the VIQ and PIQ of 18 points in favour of the latter, and the second had scored highest on spatial ability as compared to sequencing ability and acquired knowledge. Three other profiles represent students with low IQ scores that correspond to their low academic achievement scores and do not fall into a true LD category due to their low academics being caused by a deficit in cognitive ability. The sixth profile is that of the superior IQ, LD student, with motor coordination deficits and severe emotional problems. The optional

subtests Digit Span and Mazes was not administered in this study. This study suggests that the term learning disabled is given to many children with different complex problems that require different remediation strategies. These results explain why previous studies failed to detect one specific learning disability profile that all such students fall into. These authors conclude that there exists many different profiles of learning and/or reading disabilities and that the analysis of subtest profiles will greatly assist psycho-educational resource personal in diagnosing such difficulties and being able to suggest meaningful remediative procedures.

Five WISC-R reading disabled profiles were identified and their corresponding remedial strategies are discussed in two articles by Vance, Wallbrown and Blaha (1978) and Wallbrown, Vance and Blaha (1979). These five profiles are labelled; 1-Distractibility, 2-Perceptual Organization, 3-Language Disability - automatic, 4-Language Disability - pervasive, and 5-Behavioral Comprehension and Coding. These authors advocate the usefulness of utilizing subtest profiles to determine the existence of reading disabilities and also caution that some students with reading disabilities as determined by reading assessments may not show significantly different subtest profile patterns than normal readers.

The use of subtest profiles requires one very strict caveat:

> *"When there is ample support for a diagnosis from many diverse backgrounds, behaviourial, teacher-related (and in some cases medical) criteria, the emergence of a reasonable characteristic profile can be treated as one ingredient in the overall stack of evidence. However, the lack of a characteristic profile should not be considered as disconfirming evidence.  In addition, no characteristic profile in and of itself, should ever be used as the primary basis of a diagnostic decision,"* N.L. Kaufman (1979, p. 321).

The same ideology is expounded by Sattler,

> *"The goal of profile analysis is not to classify or categorize children; rather, it is to find clues about their abilities. Ideas generated from profile analysis must be viewed simply as hypotheses to be checked against other information about the examinee. By clarifying the functional nature of a child's learning problems, profile analysis may assist you in arriving at recommendations for clinical treatment, educational programs,*

*or vocational placement"* (Sattler, 1990, p. 166).

Truch, (1991) uses the above mentioned ideas to examine individual profile patterns. He makes mention of a specific subtest profile that has occurred repeatedly in his clinical practice with students who are experiencing difficulty with their reading and spelling ability, but Truch has not verified this claim by research. He suggests that these students have lower scores on their AID subtests than they do on the remainder of their WISC-R Verbal subtests.

Support for his argument is that these three subtests tap the memory component of the WISC-R. Information and Arithmetic are a function of long-term memory and Digit Span is a measure of short-term auditory memory (McManis, Figley, Richer, & Fabre 1978; N. Kaufman, 1979; Sattler 1990; and Truch, 1988). Adams, (1990) suggests that the most important factor to fluent word reading is the ability to recognize letters, spelling patterns, and whole words, visually, effortlessly and automatically. The level of this ability would depend on the level of one's memory. Other researchers have found that deficits in memory, both short-term memory and long-term memory, contribute significantly to learning disabilities (McManis, Figley, Richer & Fabre, 1978; Rose, Cundick, & Higbee, 1983; Share, Moffitt, & Silva, 1988; Siegel, & Linder, 1988). The fact that memory

contributes so significantly to one's achievement is not surprising;

> *"Memory, like cognition, is a well-known intellectual operation. Memory is also universally and historically recognized as a primary mental function."( Meeker, 1969, p. 15).*

The present study investigated the relationship between students experiencing difficulty with reading and their individual WISC-R Verbal subtest profiles. It is hypothesized that those students indicated as weak Reading or word recognition on the Reading subtest of the WRAT-R will also have lower scores on the Information, Arithmetic, and Digit Span subtests as compared to the rest of their Verbal subtest scores. Dr. Truch does not try to catagorize these students into a specific population profile. Rather he suggests, that as an aid to remedial education, for those experiencing difficulty with reading and/or spelling, these individual's WISC-R scores may shed some light on the best type of remedial program.

In order to fully appreciate Truch's logic it is necessary to have a brief overview of the evolution of reading instruction. The history of reading instruction began with the original straightforward approach of, 'teach the code and then have them read', which was prevalent

throughout the nineteenth century.  In 1920, after a plea by Horace Mann that children be taught to read whole, meaningful words first, came the "meaning first curriculum". Through the 1930' and 40's reading programs concentrated on comprehension.  Words were introduced by meaning, and were to be recognized holistically, by sight.  Phonics was given a back seat to the above method and only used sparingly as an exercise in conjunction with meaningful text.  In 1950 Rudolph Flesh's book "Why Johnny Can't Read", touched off the debate that continues to-day between the Whole Language purists and the Code-emphasis proponents.  Today the two sides are still intolerant of each other much to the detriment of the children whose interests each claim to hold so highly (Adams, 1991).

## The Psycholinguistic Model of Reading

Truch uses the Psycholinguistic Model of Reading to explain how the "whole language" method of instruction may be detrimental to approximately as much as 40% of our student population (see Figure 1).

In this model the upper left circle, Semantic, refers to the student's knowledge of the meaning of words in the real world.  It is what the student brings to the classroom and is based upon his or her own experiences.  The teacher

# Schematic Diagram Of The
# Psycholinguistic Reading Model



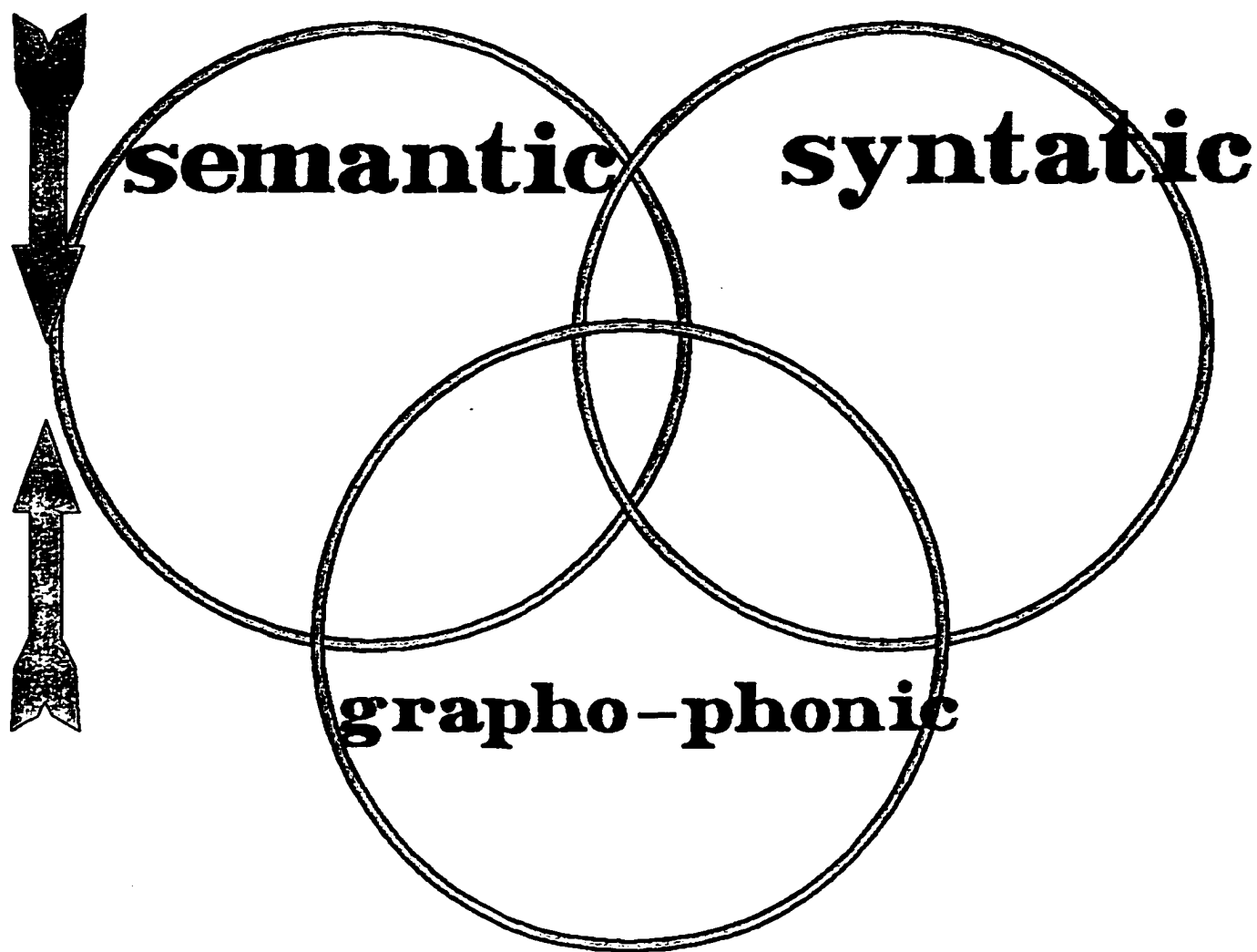**semantic** **syntatic**

**grapho-phonic**

Figure 1

The Psycholinguistic Model of Reading

Truch, (1991)

should build on this prior knowledge to assist students in making bridges to new knowledge. This assists the students in expanding vocabulary knowledge and serves as a foundation for meta-cognitive strategies. However, poor students who cannot understand the alphabetic code cannot benefit from this strategy.

The second piece of information a good reader uses is represented by the upper right circle, Syntactic, information. This is our knowledge about how word order and syntax affects meaning. Here good reader would be able to distinguish the meanings of the homonym 'bow' as in, 'the sat in by the bow of the boat', and 'the boy sat by the bow and arrow'. The use of this knowledge assists those who can already read, in making sense of the passage.

The third circle, the lower on in the centre represents grapho-phonemic or sound-symbol relationships. This is not being able to state various rules of phonics, but rather how to put the rules into use while reading. It is with this third circle that the controversy surrounding the 'whole language' approach to reading takes place.

Many whole language purists only emphasis the two top circles as they deal specifically with meaning. Approaching reading from this vantage point is call 'top-down' processing or conceptually driven methodology. Students

instructed by this method are encourage to utilize their prior knowledge to arrive at the correct meaning of the sentence. For example, in the sentence, 'The horse was in the _____.", the student could predict that the blank may well be barn, stable, meadow or possibly even creek. Any of these possible answers fits both semantic and syntactic logic. If the blank was give as "b____", the most likely guess would be barn. This is a simplified example of using 'top-down' strategies. However, if the student cannot decode 'horse' then providing the clue with the first letter is meaningless. Similarly, if the blank really was 'barge' the student who cannot decode well would miss the implied meaning that the horse was at sea and not at home.

This is the point that Truch is trying to make. The third circle, grapho-phonic, is totally neglected by many 'whole language' teachers, much to the detriment of many students. It is this 'bottom-up' or data driven information process that is crucial to those poor readers who have not grasped the sound-symbol relationships. These students cannot decode enough of the meaning to employ the predictive strategies to attain the correct meaning. These students never become self-sufficient readers as they are constantly guessing at words within their visual store that may only start with the first letter of the unknown word. These students are so focused on saying anything that they loose

sight of the fact the reading has to make sense. These students (and their parents) get extremely frustrated.

> "...during actual reading, good readers
> have no need to use context to aid decoding,
> because they recognize words so rapidly that
> the processing of other types of cues does
> not have time to be completed. Disabled
> readers, on the other hand, need to
> supplement their slow decoding abilities by
> relying on context...Thus, it appears that
> good readers acquire greater knowledge
> regarding context, as one would expect, but
> they use this knowledge minimally, if at all,
> to speed ongoing word recognition. So
> helping a disabled reader to make greater use
> of context is not likely to get at his
> reading problem, because it is not the cause
> of it." (Truch, 1991, p. 46)

While it is a good teaching practice to utilize a student's background knowledge in the act of reading, it will not assist those students who are having difficulty with the alphabetic code. That is, in order to make use of prior knowledge, the top two circles, the student must be able to decode enough information to be able to make sense of the material either semantically and/or syntactically.

This is feasible, when working one on one and the student is receiving direct feedback from an instructor on the errors being made. However, these students need to be able to decode enough material on their own to make sense of what they are reading. Only when they do this on their own will they become self-correcting readers. This is why Truch suggests that these students receive data-driven remediation methods based on the grapho-phonic circle in the model.

If students who are experiencing difficulty with reading, display the profile suggested by Truch, then continually exposing them to a whole language philosophy that totally ignores the third circle is not going to help them to become better readers. Given that 60 to 75% of all students will learn to read despite the methodology, means that there is the potential for 40% of students to remain poor or non readers (Truch, 1991).

The hypothesis that this study investigates is that the AID scores of students with average or better intellect, who are experiencing difficulty with reading will be significantly lower than their CVS scores as compared to students who are not experiencing reading difficulties.

## METHOD

### Subjects

The subjects were 908 elementary-school students (grades 1 - 8) who were referred to the Student Services department of the school board for academic and/or psychological testing. These students were referred in part because of trouble they were having coping with the daily curriculum. The identity of these students was not known as a number was assigned to each case. These subjects were screened so that only those with a Full Scale IQ above 85 were selected. This level was selected because a minimum level of general ability is needed to be successful in reading (Leong, 1989). In other words students with cognitive abilities lower than 85 would experience difficulties with reading as a result of a lower over all intellect and not due to other reasons. This resulted in a study group of 351 students. There were 229 males and 62 females. The mean age of the group was 9.8. The groups's mean grade level was 3.9 with an average IQ of 99.09

### Tests and Procedures

All students were given the Wechsler Intelligence Scale for Children - Revised (WISC-R) and the Wide Range Achievement Test - Revised (WRAT-R). The WRAT-R (which is

only a measure of word recognition and not comprehension)
was used as a measure of reading ability as it correlates
well (0.87) with the Wechsler Individual Achievement Test's
(WIAT) sub-test of Basic Reading. The Basic Reading sub-
test correlates well (0.81) with the total Reading
Assessment on the WIAT which is a measure of reading
comprehension (WIAT; The Psychological Corporation, 1992).

The Grade Equivalent scores on the Reading portion of
the WRAT-R were compared to the student's present enrolled
grade level. This resulted in a score that was either
above, at, or below the present enrolled grade level called
the Reading Indicator (RI). The RI was calculated by
subtracting the actual grade the student was enroled in at
the time of the testing from the WRAT-R grade equivalent
reading score. A negative RI indicated that the student's
reading grade equivalent, as determined by the WRAT-R, was
that much lower than the student's grade placement.
Example: (WRAT-R Grade Equivalent of 5 - Grade level of 8 =
Reading Indicator -3). The RI indicator was used to break
the study group into two different groups.

Group one, consisted of 291 students, whose RI was
greater than -1.0, which suggested that these students have
no reading problem (NRP) as their reading ability was not
more than one grade below their actual grade level. Group
two, consisted of 60 students, whose RI is less than or

equal to -1.0 indicating reading is a problem (RP).

This value for the RI was selected based on a local study that was conducted for this school district in accordance to the Lakehead District Catholic School Board's criterion. It was found that the WRAT-R norms were representative of the achievement level of the students in this district. Students with reading equivalents greater than one grade level below that of their grade placement were considered to be experiencing difficulty with basic reading and reading comprehension and in need of remediation (E. Bauman, personal communication, September 28, 1991).

Two WISC-R verbal subtest score combinations, AID and CVS, were computed. The AID component was the total of the Arithmetic, Information and Digit Span scaled scores. The second component, the CVS component, was the total of the Comprehension, Vocabulary and Similarities scaled scores. A difference called Profile Score (PS) was calculated by subtracting the AID from the CVS. A positive PS score would indicated that CVS score is greater than the AID score. Similarly a negative PS would indicate that the CVS score is less than the AID score. If Truch's theory holds then there should be a significant difference between the means of the two groups' profile scores.

<u>Results</u>

A one-way ANOVA with two groups (RP vs NRP) on PS

scores revealed no significant effect, $F(1, 349) = 0.31$, $p > 0.50$. This indicates that the hypothesis in this study, which states that the RP would have a significantly lower PS score than the NRP group is not corroborated. In other words, those students who are identified as poorer readers by a Reading Index of greater than one grade level below that of their grade placement are not significantly different from the group of no reading problem students. This would tend to negate Truch's theory that, students with average or better intellect and experiencing reading problems can be identified by Profile Score where the AID scores are lower than the CVS scores on the WISC-R.

When a frequency table (Table 1) of scores was produced using the 60 students in the RP group it was noticed that 81.66% of the students had AID total scores lower than their CVS scores. This is what Truch expected. Also, when the remaining 291 NRP students' scores were shown on a frequency table (Table 2), 82.82% of their scores also produced the same pattern.

Discussion

Support was not found for Truch's theory of lower AID than CVS scores in students with reading word recognition problems compared to those with no such problems. However, the majority of the students in this study group did display sub-test profile scores where their AID scores were lower

than their CVS scores. Is this due to the commonality of the group, that they were all referred to the testing department due to poor academic progress or some other factor? This would be an area for further research. Comparing the profiles of a control group of students not referred for testing would help in determining if there is a pattern of sub-test profile for those students who do not seem to do as well as others in their class.

Further research could be conducted by investigating Truch's contention regarding the method of instruction. A group of students who fit Truch's profile could be randomly broken into two groups. One group would receive reading instruction using the 'whole language' approach without direct phonetic instruction. The other group would receive specific phonics assistance. Pre and post testing would determine if these students benefit more from one or the other method of instruction.

The fact that approximately more than 80% of the students in the study did have the profile suggested by Truch invites other questions. Why are there so many students referred for testing who can read? Where are the weakness in the students who can read? Is this pattern just specific to this school district? How can this pattern and the knowledge of its existence be beneficial to all students? Are there more expedient methods of determining

this profile?

The above findings would support the belief that there exists a group of students with the Profile suggested by Truch. However, this profile does not differentiate among those students referred for testing, who are not experiencing difficulty with reading from those who are reading with difficulty.

Instead of trying to group reading disabled students into homogeneous categories more effort should be placed in determining exactly why each student is not reading as well as expected. By addressing each student individually and assessing his or her specific strengths and weaknesses more accurate remediation strategies can be suggested. Only then, can one be sure that the student is driving the program instead of the all too familiar situation where the program is driving the student.

More accurate instruments need to be developed to assist the psychoeducational clinician in determining the specific nature of a student's lack of reading ability and how best to address that specific need. One such simplified approach (see Figure 2) comes from (Truch, 1991, p. 37).

By utilizing the above technique of assessment with an individual student one should be able to suggest appropriate remedial programming that would address the needs of a student depending upon which quadrant the student was in.

Comprehend?

|  |  | Yes | No |
|---|---|---|---|
| Decode? | Yes | #1 | #3 |
|  | No | #2 | #4 |

Figure 2

Classification of Reading Problems

Truch, (1991 p. 39)

Students in quadrant #1 can decode and comprehend well.
Those in quadrant #2 can decode well but have difficulty
with comprehension. These students are usually found to
have low verbal ability yet do well on certain memory tests.
These students are not noticed very easily as they can read
out loud well and appear to be reading sufficiently. Top-
down strategies as suggested by 'whole language' strategies
would be beneficial. Students in quadrant #3 who can
comprehend yet cannot decode need assistance with bottom-up
methods of instruction. Those in quadrant #4 need a
combination of techniques . It is usually students in
quadrants #3 and #4 that have the most difficulty.

> *"These readers are usually the ones in*
>
> *today's resource programs." (Truch, 1991,*
>
> *p.38)*

While this is a simplified method and given that
reading occurs on a continuum and that no student would be
exactly in one quadrant only forever, it is a start. Using
a method similar to the one above would stop the argument as
to the best method of instruction based solely upon one's
philosophy of reading instruction. Whether or not to use a
code-emphasis or meaning emphasis based program would be

driven by the needs of the specific child and not because they may or may not fit into a specific profile group.

## Limitations

The above study is limited to the restrictions found in Dr. S. Truch's clinical practice. Dr. Truch does not try to differentiate between subjects in any manner other than their reading ability. His hypothesis regarding the AID profile is based upon the population of students who have been referred to him for further assessment. The above study used a similar group. No control group was used. This seriously limits the conclusions that can be drawn about the general population of students and their reading profiles.

Another limitation is that the Social Economic Status (SES) and amount of prior assistance given to some students is not known. Children from lower SES families may be suffering from cultural devrivartion and may not have been give opportunites to explore reading as much as others. The results of those who have recieved additional assistance may also skew the findings. This too limits the extent of the conclusions that can be drawn.

The discrepancy in the sample sizes further limits the conclusions that can be drawn from this study. It would

have been better to have randomly excluded some people from the larger group to make the groups more equal in size.

Another consideration is that of the selection of -1 as the RI cut off score may have been too lax for research purposes for defining the poor reader and good reader groups. Perhaps an RI of -2 would have produce more conclusive results as it would have only included students who were more than 2 grade levels behind as being poor readers.

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Table 1

Frequency Distribution of Profile Scores for Below Average
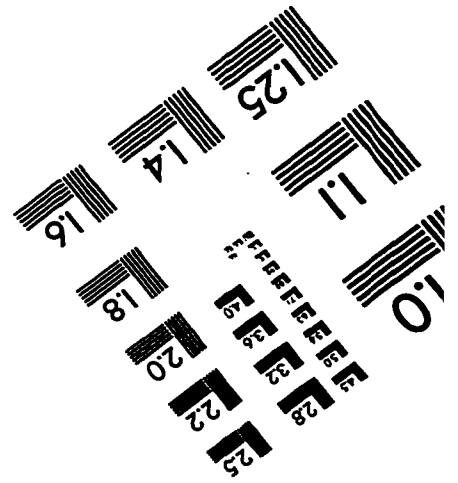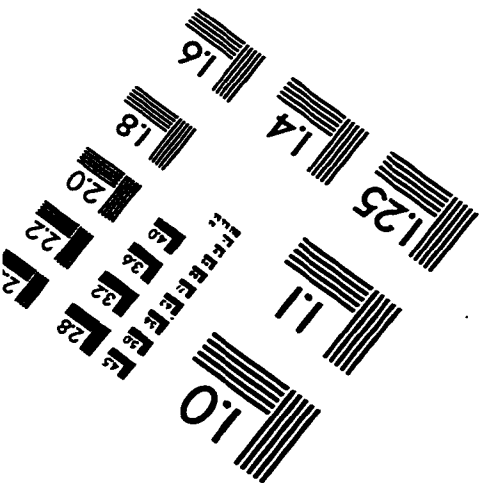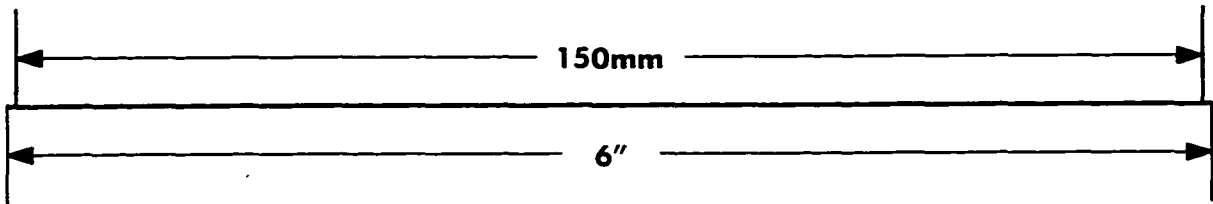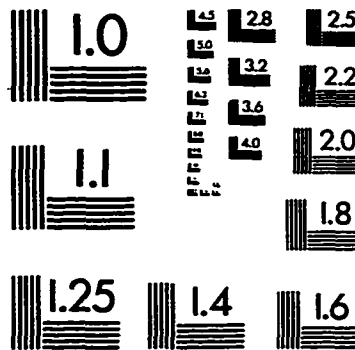Readers with a Reading Index (RI) less than or equal to -1.

| Value | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| -12 | 1 | 1.7 | 1.7 |
| -4 | 1 | 1.7 | 3.3 |
| -3 | 3 | 5.0 | 8.3 |
| -2 | 1 | 1.7 | 10.0 |
| -1 | 1 | 1.7 | 11.7 |
| 0 | 4 | 6.7 | 18.3 |
| 1 | 4 | 6.7 | 25.0 |
| 2 | 2 | 3.3 | 28.3 |
| 3 | 4 | 6.7 | 35.0 |
| 4 | 4 | 6.7 | 41.7 |
| 5 | 6 | 10.0 | 51.7 |
| 6 | 4 | 6.7 | 58.3 |
| 7 | 7 | 11.7 | 70.0 |
| 8 | 2 | 3.3 | 73.3 |
| 9 | 3 | 5.0 | 78.3 |
| 10 | 3 | 5.0 | 83.3 |
| 12 | 5 | 8.3 | 91.7 |
| 13 | 2 | 3.3 | 95.0 |
| 14 | 1 | 1.7 | 96.7 |
| 15 | 1 | 1.7 | 98.3 |
| 18 | 1 | 1.7 | 100.0 |
| | -- | ----- | |
| Total | 60 | 100.0 | |

**Table 2**

Frequency Distribution of Profile Scores for Average Readers
with a Reading Index (RI) greater than -1.

| Value | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| -8 | 4 | 1.4 | 1.4 |
| -7 | 1 | 0.3 | 1.7 |
| -6 | 4 | 1.4 | 3.1 |
| -5 | 5 | 1.7 | 4.8 |
| -4 | 6 | 2.1 | 6.9 |
| -3 | 5 | 1.7 | 8.6 |
| -2 | 10 | 3.4 | 12.0 |
| -1 | 6 | 2.1 | 14.1 |
| 0 | 9 | 3.1 | 17.2 |
| 1 | 11 | 3.8 | 21.0 |
| 2 | 16 | 5.5 | 26.5 |
| 3 | 17 | 5.8 | 32.3 |
| 4 | 19 | 6.5 | 38.8 |
| 5 | 22 | 7.6 | 46.4 |
| 6 | 18 | 6.2 | 52.6 |
| 7 | 29 | 10.0 | 62.5 |
| 8 | 21 | 7.2 | 69.8 |
| 9 | 22 | 7.6 | 77.3 |
| 10 | 16 | 5.5 | 82.8 |
| 11 | 8 | 2.7 | 85.6 |
| 12 | 8 | 2.7 | 88.3 |
| 13 | 8 | 2.7 | 91.1 |
| 14 | 4 | 1.4 | 92.4 |
| 15 | 10 | 3.4 | 95.9 |
| 16 | 3 | 1.0 | 96.9 |
| 17 | 4 | 1.4 | 98.3 |
| 18 | 3 | 1.0 | 99.3 |
| 19 | 1 | 0.3 | 99.7 |
| 20 | 1 | 0.3 | 100.0 |
| Total | 291 | 100.0 | |

# IMAGE EVALUATION
## TEST TARGET (QA–3)

150mm

6"