An Examination of the Intellectual Processes Scale of the Luria-Nebraska Neuropsychological Battery

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Bachelor of Arts

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1978

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
July, 1981

An Examination of the Intellectual Processes

Scale of the Luria-Nebraska

Neuropsychological

Battery

Thesis Approved:

Thesis Adviser

Dean of Graduate College

ACKNOWLEDGMENTS

I would like to take this opportunity to express my appreciation to those people who have been essential in my pursuit of the Master's degree. Many thanks to Bob Schlottmann, who has guided and assisted me through each phase of my graduate education since my first year in Oklahoma. I am also grateful for three years of unconditional support and advice from Ken Sandvold, and an unending supply of time and patience from Jim Price.

I would like to also thank my fellow students, Bill Atkins, Don Brantley, Candace Conley, and Robin Myers for assisting me with all of those tests.

I also wish to show my appreciation and love for my mother, Annette, and my father, Gene, for helping me reach the goals I have achieved.

Mostly, I would like to express my love and gratitude for my wife, Lois. I doubt I would have survived Oklahoma, much less the challenge of graduate school, without her. She has had to learn to do without a lot of things, including her husband at times. I will certainly need my companion to handle our next challenges.

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CHAPTER I

LITERATURE REVIEW

Introduction

The Luria-Nebraska Neuropsychological Battery (Golden, Purisch, & Hammeke, 1979b) is a relatively new tool available to clinicians. It is based on an adaptation of Aleksandr Luria's theory of the brain's relationship to purposeful behavior, and displays great promise for direct application to rehabilitation (Golden et al.). One of its current primary advantages is a significant decrease in time of administration as compared with the Halstead-Reitan batteries, the most commonly administered Neuropsychological assessment device (Golden et al., 1979a). Part of this brevity is accomplished by replacing the standard instrument for intelligence assessment, the WAIS, with an "Intellectual Processes" portion of the Luria-Nebraska. The proposed study is an attempt to determine the reliability and validity of the Intellectual Processes (IP) scale as a measure of intelligence. The following examination of relevant literature reviews some of the major considerations of the use of intelligence testing in neuropsychological assessment.

Human Neuropsychology

Human neuropsychology is the study of the link between human behavior and its anatomical correlates, the central nervous system. Neuropsychological testing involves the psychometric examination of deficits, or lack thereof, in human behavior that is the result of cerebral disease or damage.

Lezak (1976, p. 4) describes three major purposes for this clinical examination of brain functions. Currently, its primary function is that of diagnosis, and this includes the difficult task of distinquishing between psychopathology (functional disorders) and neuropathology (organic brain syndromes). The assessment of specific deficits in purposeful behavior and the extensive description of behavioral strengths and weaknesses comprise the vast majority of modern neuropsychological testing.

The mapping of neuroanatomical correlates of behavioral dysfunction (lesion localization) continues to serve as an important componant of the differential diagnostic process, as clearly seen though its emphasis by Reitan (1979). However, this localization of CNS damage for corrective measures, such as surgery, is more effectively performed by newly developed radiological techniques, particularly Computorized Axial Tomography (CAT Scan).

The second major purpose lies in patient care. An appropriate rehabilitation plan requires accurate knowledge of specific behavior limitations. In addition, repeated testing provides data on the stability of the neurological condition, and serves as a measure for the effects of medical, psychological, and rehabilitation therapies. This information is essential for the patients to understand their true limitations and to set realistic goals.

Lastly, Lezak refers to neuropsychology's function in research. Precision and reliability in neuropsychological behavioral diagnoses is necessary for advances in rehabilitation, counseling, and psychotherapeutic strategies.

The Role of Intelligence Tests in Neuropsychological Assessment

Davison (1974, p. 2) describes many ways that intelligence is affected by brain damage, and the assessment of intelligence in a neuropsychological battery is crucially important. The amount of overall impairment of intelligence is generally correlated with the size of the cerebral injury (Lishman, 1968). However, exceptions appear as frequently as the rule, and lower IQ scores are not manifested in a considerable portion of brain damaged patients, despite extensive lesions. In fact, Lezak (1976, p. 16) concludes that a discrete lesion will not cause a deficit in general intellectual ablility, regardless of its location in the cerebrum.

Perhaps the major use of the intelligence test in neuropsychological testing lies in the assessment of concrete thinking, or difficulties with abstraction and complex thought processes. This major area of investigation is probably the closest thing to a common dysfunction in organic patients, although clearly no universal symptom can be found. Lezak states that the concrete thinking of brain damage patients differs from that of persons of lower intelligence when one or more scores reflect a higher level of intellectual capability than the patient's ability to abstract would indicate. She also holds that the concrete thinking associated with brain damage usually involves deficits on scales tapping memory, distractibility, and motor skills, while such difficulties are not common to intellectual deficiencies not associated with organic involvement. Lezak further distinquishes such concrete thinking from that of psychiatric conditions by the former's independence from the emotional content of the stimulation.

The Wechsler Adult Intelligence Scale (WAIS) is one of the most commonly used psychometric devices, and is clearly the instrument of choice by professionals for the measurement of intelligence in adults (Zimmerman & Woo-Sam, 1973, p. 4). Its many years of existence and abundant use has produced

> clinicians who (have) become familiar with the virtues and limitations of each of the various subtests (and) often are very sensitive to behavioral nuances and score relationships elicited by these subtests, both individually and in their many combinations (Lezak, p. 183).

Use of the WAIS in research and as an intelligence test standard has resulted in an enormous body of published information and a universal familiarity among clinicians.

Brain damage affects performance on intelligence tests in many ways, and the construction of the WAIS offers much information regarding intellectual functioning besides an overall IQ score. The WAIS subtests take into account intellectual changes specific to age. Although no specific intellectual weakness is pathognomic of brain damage, many IQ subtest scatter patterns strongly support the formulation of just such an hypothesis by the neuropsychologist (Reitan, 1979, pp. 6-8, 12, 15-16; Parsons et al., 1969). Specific subtest strengths and weaknesses on the WAIS, as well as the traditional Verbal versus Performance Scale comparison serve as indices for localization and differential diagnoses, in addition to the assessment of intellectual capacities.

There are several neuropsychological indicators which are available only with intellectual measurements. Verbal subtests contrasted with visuospatial skill subtests can offer information as to lateralization (summary of research in Klove, 1974, pp. 227-235), although little difference is seen in longstanding brain damage (Russell, 1972). Attention and concentration impairment, as well as difficulties with short-term memory can be clearly seen in specific IQ subtests (Russell, 1972) and tend to be indicative of diffuse, and not lateralized brain damage (Lezak, 1976, p.

197). Specific IQ subtest difficulties serve as important indicators for the hypotheses of organic brain dysfunction (Rapaport et al., 1968, pp. 136, 155), and provide either diagnostic or supporting information for localization and type of disorder (Reitan, 1979, pp. 15,16).

It should be noted that no analysis of IQ test data is solely sufficient for neuropsychological decisions (Cohen, 1957, Lezak, p. 195; Reitan and Davidson, 1974, p. 235). One historically important attempt, Wechsler's Deterioration Quotient (Wechsler, 1958, p. 211), has also proved unsuccessful in classifying organic brain damage (Payne, 1961; Small, 1973; Russell, 1972).

The global familiarity, wealth of published research, and analytical format of the Wechsler Scales has caused it to be the intelligence scale of choice in many neuropsychology batteries. Most notably, it is generally incorporated in the Halstead-Reitan Neuropsychological Battery (Reitan), the most widely used examination procedure.

The Luria-Nebraska

Recently, a major effort to produce a radically different neuropsychological battery has become available to clinicians. The Luria-Nebraska (Golden et al., 1979b) is heavily dependent upon Aleksandr Luria's neuropsychological conceptualizations of the brain-behavior relationship. This theory involves an extremely complex evolution of the limited "localization of function" concept. Briefly, complicated human behaviors cannot be localized to specific neuroanatomical sections of the cerebrum. Rather, they

> must be distributed in a complete system (or in a constellation) of cooperating zones of the cerebral cortex and the subcortical structures . . . each of the areas makes a highly specific contribution to ensure the operation of the functional system (Luria, cited in Christensen, 1975, p. 17).

Thus, evaluation of the effect of brain damage must consider what "functional system(s)" is (are) involved.

Luria proposes "cortical analyzers" or "cortical nuclei" as a way of understanding the brain's role in higher mental functioning. The first such "zone" is a "primary" or "projection" area. These areas have a

> strict somotopic organization in that different points within a given area correspond to specific points in the peripheral receptor organ or, in the case of the motor analyzer, to specific muscle groups (Luria, 1965, p. 695).

Discrete damage in these areas does produce loss of function in localized area.

"Secondary" or "projection-association" areas lie adjacent to primary areas. Afferent fibers do not stem from receptor organs. Rather, they predominately receive impulses from primary areas, being "in a position to consolidate excitation received from different structures. It makes possible the establishment of reverberating circuits, and it can transmit excitation to cortical circuits" (Luria, p. 696). "Tertiary" areas "<u>receive their input from two or more analyzers</u> and receive impulses which have been transmitted through a number of different structures" (italics by Luria, p. 696).

Luria summarizes that:

> we are forced to discard outright any idea that they (higher mental functions) may be localized in limited areas of the cortex. Instead, we must propose that each of them is accomplished by physiological processes involving the entire brain as a whole and that each depends upon the dynamically interrelated functions of a number of simultaneous acting cortical zones (p. 701).

The Luria method of neuropsychological testing attempts to tap seperate weaknesses of performance by administering items which are sensitive to ". . . one specific cognitive ability or combinations of abilities representing specific association areas of functional systems in the brain" (Golden et al., 1979b, p. 108). Golden et al. criticize the use of more comprehensive tasks, such as the Halstead Category Test, for being sensitive to many forms of dysfunction.

The Luria-Nebraska Neuropsychological Battery can be administered in approximately 2 1/2 hours. It has scales to investigate abilities in motivation, rhythm and pitch, tactile, visual, receptive language, expressive language, writing, reading, arithmetic, memory, and intelligence, as well as a pathognomic sign and lateralization scales. Its use of _T_ scores for each scale allows each scale score to be directly compared to normative populations. However, Golden et al. (1979b, p. 109) emphasize the importance of consideration for each item, as patients may often score within the normal range of a scale and still demonstrate significant dysfunction. It is the specificity of the item construction which allows the deduction of brain damage from item patterns, despite the presence of normal scale scores.

Recent research with the Luria-Nebraska has been promising. The senior author of this standardized application of Luria's procedures, Charles Golden, demonstrated 90% of the items to significantly discriminate normal from brain damaged subjects (Golden et al., 1979a, p. 6). Further studies demonstrate the battery's ability to discriminate the lateralization of the cerebral damage in 87 - 100% of the subjects sampled (McKay and Golden, 1979a, p. 1), as well as the ability to discriminate schizophrenia from brain damage with an 88% success rate, superior to all previous tests or batteries (Purisch et al., 1979, pp. 54, 57). The scale demonstrates significant promise for localization by item analysis (McKay and Golden, 1979b, p. 22).

It should be noted that Golden has been the target of some severe criticism aimed at the methodology of the Luria-Nebraska Neuropsychological Battery (Adams, 1980a, pp. 511-515; 1980b, pp.522-524), extending from faulty experimental design and inappropriate sampling of subjects to invalid conclusions from the data. In addition, some constructive criticisms of the Luria-Nebraska seem appropriate at this time. The American Psychological Association has published "Standards for Educational & Psychological Tests"

(1974) as a guideline for professional construction of tests and manuals.

> The statements listed as 'essential' are intended to represent the consensus of present-day thinking concerning what is normally required for competent use of a test. If some type of essential information is not available on a given test, it is important to help the reader recognize that the research on this test is incomplete in this respect. A test manual should include clear statements of what research has been done and avoid misleading statements (pp. 6-7).

The Luria-Nebraska manual is lacking essential statements concerning description of the test development (p. 11), evidence of validity and reliability (p. 15), norms (p. 20), validity of test inferences (p. 31), and complete and accurate descriptions of criteria (p. 33) for the performance dimension scales. Discussions of validity, reliability, norms, etc., are predominantly restricted to the few studies mentioned previously, and are limited to the battery's overall ability for differential diagnosis of organic brain dysfunction. In an attempt to achieve this information, Golden has recently published intercorrelations of items for the battery's writing scale (Golden & Berg, 1980a, pp. 8-12) and portions of the motor scale (Golden & Berg, 1980b, pp. 66-71).

Statement of the Problem

At present, there is no published information concerning IP scale of the Luria-Nebraska. Golden et al. (1979b, pp. 140-141) claim the WAIS has a majority of items which are not affected by brain damage, explaining them to be associated with a person's learning history. In addition, they claim the functional level of a brain-damaged subject's performance is "significantly less than the person's level of intelligence as measured by the Wechsler Adult Intelligence Scale" (p. 141). The present research investigated the scale's effectiveness as a tool for assessment of intellectual abilities as part of a neuropsychological test battery.

Non-brain damaged subjects were evaluated with both the WAIS and the IP scale of the Luria-Nebraska. Such a population removed the various effects of brain damage on intelligence, and permitted the investigation of the validity of the IP scale as a test of intelligence (as it is designed to replace other measures of intelligence for this neuropsychological battery). Correlations were obtained comparing the various measures of the WAIS and IP scale. In addition, sex and school differences (high school vs. college) on performance were examined.

CHAPTER II

METHOD

Subjects

The sample consisted of 30 Cushing, Oklahoma High School students and 30 Oklahoma State University Psychology students balanced for sex. The high school students were volunteers from psychology classes who were seeking exposure to a major psychometric tool, while the college students received "bonus" points for their participation. The sample was expected to show a restricted range with respect to the population in general, since those persons with deficient intelligence or academic handicaps would not be included in the regular high school or college class. The use of differentially educated subjects allowed for an examination of education level on the test materials.

Materials

The IP scale of the Luria-Nebraska is described by its authors as being composed of items that are all sensitive to brain dysfunction (Golden et al, 1979b, p. 140). For a normal (non-brain damaged) population, the authors claim equivalence between the IP scale and the WAIS for IQ's of 100 or below (p. 141). The scale consists of 26 individually scored tasks, each containing one to three questions. In addition, eight of the tasks are additionally scored for speed of response, resulting in 34 seperately scored items All items are scored either 0 or 2 (with zero being the absence of errors, the optimal response), or 0, 1, or 2, including a scoring category for responses which are less than perfect yet worthy of partial credit.

Although the items are not formally divided into subtests (as are the Wechsler scales), the IP scale has clearly distinquishable sections of similar items. These sections hypothetically tap different abilities, and performance failure is used (with additional information from the entire battery) to indicate localization of dysfunction as well as deficits in behavior (pp. 141-143). Subsection "a" (as labeled by the present author, items 236-237) requires a description of the events in thematic pictures. Subsection "b" (items 238-241) involves a task similar to picture arrangement on the Wechsler scales (p. 141), and the two tasks are scored for both correctness of order (subsection b1, items 238 and 240) and time of performance (subsection b2, items 239 and 241). Subsection "c" requires the verbalization of the humor in two animated comic strips. These three sections are grouped together (section I) by the test's authors as related tasks that are missed by frontal lobe dysfunction patients, right hemisphere dysfunction patients whose condition interferes with interpretation of verbal themes, or patients with scanning difficulties which result in an inability to focus beyond a single area, as seen in premotor or occipital cortex patients.

The second section (II) consists of three subsections that test for an understanding of verbal thematic expressions, and is claimed to be parallel to the items of section I except for its verbal method of presentation. Subsection "d" (item 244) asks questions of both description and judgement concerning a story that is simulataneously presented in both verbal and written mode. Subsection "e" (item 245) asks for the meaning of two common expressions presented verbally, while subsection "f" (items 246-247) asks for the meaning of verbally presented proverbs. This latter section consists of two items, one requiring a multiple choice of answers while the other requires a verbal response, with a discrepancy hypothetically tapping a problem in expressive lanquage functioning.

The third section (III) involves simple definitions and relationships of verbally presented objects. Subsection "g" (item 248) asks for two definitions. Subsection "h" (items 249-250) has two items, the first asking for similarities between objects while the second requests differences. The authors claim these items to be similar to the similarity subtest of the WAIS (p. 142). Subsection "i" (items 251-254) requests different logical relationships between objects and group membership. Subsection "j" (item 255) tests opposites, while subsection "k" (items 256-257) tests analogic abilities.

Section IV (subsection "l") consists of six arithmetic tasks that are scored separately for both accuracy (subsection 11, items 258, 260, 262, 264, 266, 268) and speed of performance (subsection 12, items 259, 261, 263, 265, 267, 269). The tasks are simple word problems, and despite their simultaneous verbal and written presentation, are claimed by the authors to be similar to the WAIS arithmetic subtest (p. 142). A specimen of the IP scale answer sheet (reprinted with permission; Golden et al., 1979b, pp. 183 - 184) is given in Figure 1, Appendix A).

No localization statements or analyses of functions tapped are offered for sections III and IV. In general, the authors claim an overall deficit on the IP scale with more severe frontal injuries, while some frontal damage, particularly that localized in the orbital area, may result in an intact performance (p. 146). In addition, they claim few marked intellectual losses with unilateral right frontal hemisphere damage, with the possible exception of section I (p. 146). Right temporal lobe damage, particularly that involving visual processing and/or sequential operations (p. 148), and left parietal damage (p. 149) may also result in an overall IP scale reduction. The authors do stress the current developmental status of the Luria-Nebraska, and hypothesize more specific and extensive use of the battery in the future.

The Wechsler Adult Intelligence Scale (Wechsler, 1955) is one of the most widely used measures of adult intelligence. It was copyrighted in 1955 and standardized on a nationwide sample of 1700 adults, including a proportionate number of minority subjects based on the 1950 U.S. Census.

Procedure

The WAIS and the IP scale were administered to the students at their respective schools. The tests were administered by the instructor of a graduate clinical psychology laboratory course on intelligence test administration and five thoroughly examined graduate students of clinical psychology. The subjects were informed that they were participating in "test standardization" research, and that information as to their intelligence or feedback about their performance would not be made available to anyone, including themselves. Order of test administration and sex of tester were counterbalanced.

CHAPTER III

RESULTS

Inspection of the sample data (Table III, Appendix B) indicated a somewhat elevated WAIS Full Scale IQ (FS) and reduced standard deviation, when compared with WAIS normative data. However, a comparison with the recently released WAIS-R indicated the WAIS scores to be 7-8 points higher, a commonly seen phenomenon with test revisions. The Wechsler study (1981, p. 47) comparing the WAIS to the WAIS-R resulted in a WAIS mean FS score of 111.3, comparable to the FS mean score in the present study of 110.0. Thus, the mean IQ of the experimental sample did not appear elevated with respect to the general population, but the sample was still limited by a restricted standard deviation.

Table I contains correlation coefficients for WAIS IQs and subtests with the IP scale overall $\underline{T}$ scores and major section raw scores. The FS and IP scale Pearson correlation coefficient of -0.7407 is significant ($\underline{p} < 0.0001$). The negative value reflects the fact that high scores on the IP scale are indicative of a lower performance, since the IP $\underline{T}$ score is derived from a sum of the errors. The IP scale has slightly lower correlations with the WAIS Verbal Scale (VS)

TABLE I

CORRELATION ANALYSIS OF WAIS AND IP SCALE: IQS, WAIS SUBTESTS, AND IP SECTIONS

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	FS	VS	PS	INFO	COMP	ARITH	SIM	DSP	VOC	DSY	PC	BD	PA	OA
IP	-0.74076	-0.67030	-0.62504	-0.54681	-0.40616	-0.52303	-0.59057	-0.29127	-0.67285	-0.25467	-0.48811	-0.50375	-0.29434	-0.57354
	0.0001	0.0001	0.0001	0.0001	0.0013	0.0001	0.0001	0.0240	0.0001	0.0496	0.0001	0.0001	0.0224	0.0001
I	-0.39393	-0.33797	-0.39270	-0.36810	-0.31411	-0.20262	-0.30825	-0.01722	-0.47806	-0.05899	-0.32472	-0.32172	-0.23305	-0.36746
	0.0018	0.0083	0.0019	0.0038	0.0145	0.1205	0.0166	0.8961	0.0001	0.6544	0.0114	0.0122	0.0731	0.0039
II	-0.43588	-0.37777	-0.36454	-0.30363	-0.27498	-0.20661	-0.32679	-0.00223	-0.40007	-0.13338	-0.45510	-0.23583	-0.04858	-0.40034
	0.0005	0.0029	0.0042	0.0184	0.0335	0.1132	0.0108	0.9865	0.0015	0.3096	0.0003	0.0697	0.7124	0.0015
III	-0.65123	-0.57739	-0.53905	-0.53425	-0.33905	-0.41054	-0.63290	-0.22989	-0.55761	-0.24591	-0.42253	-0.45749	-0.16985	-0.44479
	0.0001	0.0001	0.0001	0.0001	0.0080	0.0011	0.0001	0.0772	0.0001	0.0582	0.0008	0.0002	0.1944	0.0004
IV	-0.74996	-0.70873	-0.58802	-0.45457	-0.32132	-0.66415	-0.53659	-0.49403	-0.59215	-0.31877	-0.38279	-0.47189	-0.32763	-0.54119
	0.0001	0.0001	0.0001	0.0003	0.0123	0.0001	0.0001	0.0001	0.0001	0.0131	0.0025	0.0001	0.0106	0.0001

and Performance Scale (PS), with significant correlations of -0.6703 and -0.6260, respectively ($p < 0.0001$). In addition, the IP scale shows significant correlations with every subtest of the WAIS.

Each of the four major sections of the IP scale correlates significantly with the WAIS FS, VS, and PS. In general, the four sections also correlate well with each of the WAIS subtests. Sigificant correlations were found for 33 of the 44 correlations, with all but three of these exceptions occuring with the subtests of the "freedom from distractibility" factor (ARITH, DSP, and DSY - Kaufman, 1975, pp. 135-147). Correlation coefficients for the IP scale sections and WAIS scales and subtests are also listed in Table IV (Appendix B).

Table V and Table VI (Appendix B - the IP scale was reversed to allow for positive correlations) contain correlation coefficients with the sample being divided into high and low WAIS IQ groups, using the median for a cut-off score and resulting in unequal sample sizes. A true median split would have required an arbitrary assignment of those subjects with IQs equal to the median to the high and low IQ groups. Correlations were then obtained for WAIS scale and subtests with the IP scale overall score, sections and subsections, for the high and low IQ groups separately. The IP scale was a poor predictor of high WAIS IQ scores ($r = 0.1379$, $p = 0.4533$). Correlations for WAIS subtests and IP sections and subsections were equally low for this high group.

In the low WAIS IQ group, the correlation of 0.7643 with the IP scale was significant ($p < 0.0001$), as was each of the correlations with the IP scale sections. Fisher's Z transformation allowed for a test for significant differences between the correlations of WAIS FS and the IP scale for low with high IQ groups, which was found to be significant ($p = 0.0008$). This discrepency in results is consistent with Golden et al's (1979b, p. 141) claim that the two tests should be equivalent for IQs under 100.

A 2 X 2 X 2 repeated measures ANOVA was used to determine the presence of mean differences by sex and school (high school vs. college) of subject as measured by scores on the WAIS and IP scale (Table VII, Appendix B). While sex was predictably non-significant, school was significant, $F(1,56) = 10.93$, $p = 0.0017$. The mean IQ for high school was 104.5, and for college was 113.8. A significant interaction was found for school and test, $F(1,56) = 9.29$, $p = 0.0035$. High school mean IQs were 107.3 and 101.8 for the FS and IP scale, respectively, with college mean IQs being 112.7 and 114.8, respectively. Tukey's HSD (Kirk, 1968) comparison of means was used to examine the differences of tests within schools. The FS and IP scale were found to be significantly different for both high school and college students ($p < 0.05$). Mean scores for each group in the analysis may be found in Table VIII (Appendix B).

As the VS and PS contribute to the composition of the FS, separate ANOVA procedures were necessary. A 3 X 2 X 2 repeated measures ANOVA examined the presence of mean differences by sex and school of subject with scores on the VS, PS, and IP scale (Table IX, Appendix B). Again, sex was a nonsignificant factor while school was found to be significant, $\underline{F}(1,56) = 9.72$, $\underline{p} = 0.0029$. The high school mean IQ was 105.0, and college was 112.9. The school and test interaction was also found to be significant, $\underline{F}(2,112) = 5.18$, $\underline{p} = 0.0071$. High school mean IQs for the VS, PS, and IP scale were 106.9, 106.3, and 101.8, respectively, with college mean IQs being 111.9, 112.1, and 114.8, respectively. Tukey's HSD comparison of means was used to examine the differences within schools. The VS and PS were found to be significantly different from that of the IP scale for both the high school and college sample ($\underline{p} < 0.05$). Mean scores for each group in the analysis may be found in Table X (Appendix B).

A recent examination of the Luria-Nebraska Neuropsychological Battery with the WAIS (McKay et al., in submission) has yielded regression equations for the prediction of WAIS FS and VS quotients. The regression equations are presented by the authors as being a more effective transformation than the simple transformation performed above. No regression equation was offered for the PS, as the authors report that they found the IP scale in their study to account for only 55% of the variance in the PS, leading them to conclude that the scale was "a much better indicator of verbal and general intelligence than of performance skills." A 2 X 2 X 2 repeated measures ANOVA was used to examine sex and school with WAIS FS and FS estimated from the regression equations (IPFS). Only school was found to be significant, $F(1,56) = 9.77$, $p = 0.0028$ (Table XI, Appendix B). IQ means for high school and college were 106.3 and 113.0, respectively. Mean scores for each group in the analysis are presented in Table XII (Appendix B).

A 2 X 2 X 2 repeated measures ANOVA was used to examine sex and school with WAIS VS and VS estimated from the regression equations (IPVS). Again, only school was found to be significant, $F(1,56) = 9.13$, $p = 0.0038$ (Table XIII, Appendix B). IQ means for high school and college were 106.1 and 112.6, respectively. Mean scores for each group in the analysis are presented in Table XIV (Appendix B).

Analysis of internal consistency indicated the IP scale to be generally consistent throughout the entire instrument. Section-total (Table II) correlations were each found to be significant ($p < 0.0001$). While sections I, III, and IV had percent correct values ranging from 68-82%, section II items (numbers 244-247) resulted in percent correct values of 81, 52, 91, and 95, respectively. Thus, the reduced correlation for section II seems to reflect its extremes in differential levels of difficulty. Subsection-section (Table XV,

TABLE II

SECTION-TOTAL CORRELATION ANALYSIS

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	IP
I	0.80969 0.0001
II	0.51354 0.0001
III	0.78292 0.0001
IV	0.84648 0.0001

Appendix B) correlations were also found significant, with the exception of subsection j. This single item (number 255) was answered correctly by the entire sample, and its low level of difficulty may make it useful for low intelligence clinical patients. The lack of representation of this latter population in the experimental sample makes interpretation of the item-total (Table XVI, Appendix B) correlations difficult, particularly on the items which were answered correctly by the entire sample (items numbers 252, 258, 260, as well as 255). Item-section (Table XVII, Appendix B) correlations were all found to be significant, with the exception of those four items correctly answered by the entire sample. A breakdown of subsections b and l into items scored by correctness of response (b1 and l1) and pure speed of response (b2 and l2) is shown in Table XVIII (Appendix B). Both correlations were significant ($\underline{p}$ < .0001), with accuracy of response slightly higher than time to respond (this latter factor is scored independently of the correctness of the response).

CHAPTER IV

DISCUSSION

The present study suggests the Luria-Nebraska Intellectual Proccesses scale to be a fairly useful screening device for the assessment of intelligence with a non-brain damaged population. Its correlation with the WAIS is comparable to many widely used IQ screening tests (e.g. Peabody Picture Vocabulary Test - Revised, Dunn & Dunn, 1981, p. 63). As predicted by the Luria-Nebraska's authors, the IP scale is a much more sensitive device for subjects with average to below average intelligence than for those subjects with above average intelligence. The simplicity of many of its questions fails to test the limits of cognitive capacities for above average subjects.

Two recent studies have compared the IP scale with the WAIS on neurological and psychiatric populations, although item, section, and subsection analyses were not performed. Prifitera and Ryan (in submission) examined 33 psychiatric patients and found correlations of .86, .86, and .76 between the IP scale and the WAIS FS, VS, and PS, respectively. McKay et al. (in submission) examined 280 patients with varied diagnoses, who were all being examined for neurological disorders. They found correlations of .84, .84, and .74 between the IP scale and WAIS FS, VS, PS, respectively. It should be noted that no tests for significant mean differences were reported. However, the present study found lower correlations than those of these two studies, and failed to find comparable differences between the VS and PS correlations when compared with the IP scale.

To interpret these discrepencies, the populations sampled and theoretical goal of the IP scale must be taken into consideration. Non-specific brain damaged populations score lower on most measures of intelligence. Thus, the higher correlations found in the two aforementioned studies may be a function of sampling a population with a lower mean IQ.

To reiterate the IP scale's construction, all of the items were designed to be sensitive to the presence of brain dysfunction, while the Wechsler scale is not (Golden et al., 1979b, p. 140). Thus, if the IP scale and WAIS are comparable for subjects without brain damage, a brain damaged population should yield differential results on the IP scale when compared with the WAIS. The lower correlation of the IP scale with the PS indicate that the IP scale is a better measure of Full Scale and Verbal Scale IQs than of the Performance Scale of the WAIS.

The McKay et al. regression equations were useful in reducing the school and test interaction effects. A simple _T_ to standard score (mean = 100, S.D. = 15) transformation is not appropriate, as the WAIS is based on a national sample. The present study indicates that such a regression transformation is applicable to a normal population as well.

The clinician who uses a neuropsychological battery in a diagnostic evaluation must ultimately decide on the appropriateness of each tool. The IP scale will give a good estimate of the current level of intellectual functioning for normal and below normal patients. It is also brief, and additionally contributes to the lateralization scale (left-right hemisphere) of the battery. However, it lacks the breakdown of intellectual functioning afforded by the WAIS, both in its verbal and performance scales, and its subtests. The precision by which the clinician wishes to analyze intellectual functioning will therefore depend upon the patient, the presenting problem, and the diagnostic questions and issues.

REFERENCES

Adams, K. M. In search of Luria's battery; a false start. *Journal of Consulting and Clinical Psychology*, 1980a, *48*, (4), 511-516.

Adams, K. M. An end of innocence for behavioral neurology? Adams replies. *Journal of Consulting and Clinical Psychology*, 1980b, *48*, no. 4, 522-524.

American Psychological Association, Inc. *Standards for educational & psychological tests*. Washington, D.C.: author, 1974.

Christensen, A. *Luria's neuropsychological investigation* Holliswood, New York: Spectrum Publications, 1975.

Cohen, J. C. Factor-analytically based rationale for Wechsler adult intelligence scale. *Journal of Consulting Psychology*, 1957, *21*, 451-457.

Davidson, L. A. In R. M. Reitan & L. A. Davidson (Eds.), *Clinical neuropsychology: Current status and application*. Washington, D.C.: Winston & Sons, 1974.

Dunn, l. M. & Dunn, L. M. *Peabody Picture Vocabulary Test - Revised*. Circle Pines, Minnesota: American Guidance Service, 1981.

Golden, C. J. & Berg, R. A. Interpretation of the Luria-Nebraska neuropsychological battery by item intercorrelation: The writing scale. *Clinical Neuropsychology*, 1980a, *II*(1), 8-12.

Golden, C. J. & Berg, R. A. Interpretation of the Luria-Nebraska neuropsychological battery by item intercorrelation: Items 1-24 of the motor scale. *Clinical Neuropsychology*, 1980b, *II*(2), 66-71.

Golden, C. J., Hammeke, T. A. & Purisch, A. D. Diagnostic validity of a standardized neuropsychological battery derived from from Luria's neuropsychological tests. *Clinical Neuropsychology*, 1979a, *I*(1), 1-7.

Golden, C. J., Purisch A. D., & Hammeke, T. A. *The Luria-Nebraska neuropsychological battery: A manual for clinical and experimental uses*. Nebraska: University of Nebraska Press, 1979b.

Helwig, J. T. & Council, K. A. (Eds.) SAS user's guide, 1979 edition. Raleigh, North Carolina: SAS Institute, Inc., 1979.

Kaufman, A. S. Factor analysis of the WISC-R at 11 age levels between 6 1/2 and 16 1/2 years. Journal of Consulting and Clinical Psychology, 1975, 43, 135-147.

Kirk, R. E. Experimental design: Procedures for the behavioral sciences. Belmont, California: Brooks/Cole, 1968.

Klove, H. Validation studies in adult neuropsychology. In R. M. Reitan & L. A. Davidson (Eds.), Clinical neuropsychology: Current status and application. Washington, D.C.: Winston & Sons, 1974.

Lezak, M. D. Neuropsychologica assessment. New York: Oxford University Press, 1976.

Lishman, W. A. Brain damage in relation to psychiatric disability after head injury. British Journal of Psychiatry, 1968, 114, 373-410.

Luria, A. R. Neuropsychological analysis of focal brain lesions. In B. Wolman (Ed.), Handbook of clinical psychology. New York: McGraw-Hill, 1965.

Maher, B. A. Intelligence and brain damage. In N. R. Ellis (Ed.), Handbook of mental deficiency. New York: McGraw-Hill, 1963.

Matarazzo, J. D. Wechsler's measurement and appraisal of adult intelligence (5th ed.). Baltimore: Williams & Wilkens, 1972.

McKay, S. & Golden, C. J. Empirical derivation of neuropsychological scales for the lateralization of brain damage using the Luria-Nebraska neuropsychological test battery. Clinical Neuropsychology, 1979a, I(2), 1-5.

McKay S. & Golden, C. J. Emperical derivation of experimental scales for localizing brain lesions using the Luria-Nebraska Neuropsychological Battery. Clinical Neuropsychology, 1979b, I(4), 19-23.

McKay, S. E., Golden, C. J., Moses, J. A. Jr., Fishburne, F., & Wisniewski, A. Correlation of the Luria-Nebraska neuropsychological battery. Manuscript submitted for publication.

Parsons, O. A., Vega, A., & Burn, J. Different psychological effects of lateralized brain damage. _Journal of Consulting and Clinical Psychology_, 1969, _33_, 551-557.

Prifitera, A. & Ryan, J. J. Validity of the intellectual processes scale as a measure of adult intelligence. Manuscript submitted for publication.

Purisch, A. D., Golden, C. J., and Hammeke, T. A. Discrimination of schizophrenic and brain-injured patients by a standarized version of Luria's neuropsychological tests. _Clinical Neuropsychology_, 1979, _I_(2), 53-59.

Rapaport, D., Gill, M. M., & Schafer, R. _Diagnostic psychological testing_. New York: International Universities Press, 1968.

Reitan, R. M. _The effects of brain lesions on adaptive abilities in human beings_. Tuscon, Arizona: Neuropsychology Laboratory, 1979.

Reitan, R. M. _Manual for administration of neuropsychological test batteries for adults and children_. Seattle, Washington: Neuropsychology Laboratory.

Robb, G. P., Bernardoni, L. C., & Johnson, R. W. _Assessment of individual mental ability_. New York: Internation Textbook, 1972.

Russell, E. W. Wais factor analysis with brain-damaged subjects using certain criterion measures. _Journal of Consulting and Clinical Psychology_, 1972, _39_, 133-139.

Small, L. _Neuropsychodiagnosis in psychotherapy_. New York: Brunner/Mazel, 1973.

Wechsler, D. _Manual for the Wechsler Adult Intelligence Scale_. New York: The Psychological Corporation, 1955.

Wechsler, D. _The measurement and appraisal of adult intelligence (4th ed.)_. Baltimore: Williams & Wilkins, 1958.

Wechsler, D. _Wechsler Adult Intelligence Scale - Revised_. New York: The Psychological Corporation, 1981.

Zimmerman, I. L. & Woo-Sam, J. M. _Clinical interpretation of the Wechsler Adult Intelligence Scale_. New York: Grune & Stratton, 1973.

APPENDIX A

FIGURES

INTELLECTUAL PROCESSES Item — Observations	Raw Data	Scaled Score	
236. Tell what's happening in picture (N1)		0 1 2	R*
237. Tell what's happening in (N2)		0 1 2	
*238. (Put out N9 - N13) Picture arrangement ________ Order	30"	0 2	
239. Score time ________ Time		0 1 2	R*
*240. (Put out N14 - N18) Picture arrangement ________ Order	30"	0 2	L*
241. Score time ________ Time		0 1 2	P
242. What's comical (N19)		0 2	
243. What's comical (N22 - N23)		0 2	
244. Listen (Read story give patient M8) - Man do ________ Right ________ Moral ________		0 1 2	
245. Explain expressions "iron hand" ________ "green thumb" ________		0 1 2	
246. Explain saying "don't count chickens...."		0 1 2	
247. Select correct explanation of sayings (N24) (c), (N25) (a)		0 1 2	
248. Define: table ________ island ________		0 1 2	L*
249. How are: table and sofa alike ________ axe and saw ________		0 1 2	
250. Difference: fox - dog ________ stone and egg ________		0 1 2	
251. (Give example) What group: rose ________ carp ________		0 2	
252. (Example) Give member: vehicles ________ tool ________		0 2	
253. What are parts of whole "knife".		0 2	
254. What is whole of part "pages" ________ "trees" ________		0 1 2	

Figure 1. Intellectual Processes Scale Score Sheet

INTELLECTUAL PROCESSES con't. Item Observations	Raw Data	Scaled Score	
255. What is opposite of "high"________ "fat"________		0 2	
256. ________ is to "good" as "high" : "low" ________ is to "wide" as "fat" : "thin" ________: "hand" as shoe : "foot"		0 1 2	
257. Which does not belong: spoon <u>table</u> glass plate cigar <u>wine</u> cigarette tobacco		0 2	
*258. (N30) Read problem (patient follows) Error Peter 2, John 6	10"	0 2	L*
259. Score time		0 1 2	L*
*260. (N31) Read problem (patient follows) Error (Jane 7, gave 3)	10"	0 2	
261. Score time		0 1 2	L*
*262. (N32) (Read problem. Mary 4, Betty 2 more) Error	10"	0 2	
263. Score time		0 1 2	
*264. (N33) (Read Farmer problem, patient follows) Error	10"	0 2	
265. Score time		0 1 2	R*
*266. (N34) (Read book problem) Score Error	30"	0 2	R*
267. Score time		0 1 2	P
*268. (N37) (Read pedestrian problem) Score Error	30"	0 2	L*
269. Score time		0 1 2	L*
	Intellectual Processes Total		

Figure 1 (Continued)

APPENDIX B

TABLES

TABLE III

SAMPLE DESCRIPTORS

VARIABLE	N	MEAN	STD DEV	MINIMUM	MAXIMUM
FS	60	110.00000000	9.67786221	79.00000000	128.00000000
VS	60	109.41666667	10.25156733	77.00000000	128.00000000
PS	60	109.18333333	10.61736931	84.00000000	132.00000000
INFO	60	10.43333333	2.33881519	6.00000000	16.00000000
COMP	60	11.98333333	2.80128098	7.00000000	18.00000000
ARITH	60	10.13333333	2.58067559	4.00000000	17.00000000
SIM	60	12.41666667	2.23448828	3.00000000	16.00000000
DSP	60	10.50000000	3.17564887	4.00000000	19.00000000
VOC	60	10.85000000	2.18488645	5.00000000	15.00000000
DSY	60	12.78333333	2.59132625	8.00000000	19.00000000
PC	60	10.78333333	1.78593058	8.00000000	17.00000000
BD	60	11.91666667	2.58608838	6.00000000	17.00000000
PA	60	10.36666667	1.99122358	7.00000000	16.00000000
OA	60	11.08333333	3.67442682	4.00000000	18.00000000
IP	60	91.68483333	15.15206452	64.37000000	148.75000000
I	60	5.05000000	3.25433218	0	14.00000000
II	60	1.58333333	1.19733697	0	5.00000000
III	60	3.55000000	2.31007374	0	12.00000000
IV	60	4.38333333	3.57055599	0	16.00000000
A	60	1.21666667	0.94045908	0	3.00000000
B	60	2.73333333	2.15396101	0	8.00000000
B1	60	1.95000000	1.50056487	0	4.00000000
B2	60	0.78333333	1.13632871	0	4.00000000
C	60	1.10000000	1.44621071	0	4.00000000
D	60	0.36666667	0.48596110	0	1.00000000
E	60	0.95000000	0.67459969	0	2.00000000
F	60	0.26666667	0.57832800	0	2.00000000
G	60	0.68333333	0.50393928	0	2.00000000
H	60	1.93333333	1.07619333	0	4.00000000
I	60	0.65000000	1.19071265	0	6.00000000
J	60	0	0	0	0
K	60	0.38333333	0.69114660	0	3.00000000
L	60	4.38333333	3.57055599	0	16.00000000
L1	60	2.40000000	2.32306052	0	8.00000000
L2	60	1.98333333	1.93532432	0	8.00000000

TABLE IV

CORRELATIONS OF WAIS AND IP SCALE SUBSECTION DATA

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	A	B	B1	B2	C	D	E	F
FS	-0.13594	-0.38946	-0.20308	-0.47007	-0.21798	-0.14415	-0.35047	-0.37248
	0.3004	0.0021	0.1197	0.0002	0.0943	0.2718	0.0060	0.0034
VS	-0.12731	-0.35564	-0.17822	-0.43879	-0.14805	-0.06181	-0.31064	-0.36783
	0.3324	0.0053	0.1731	0.0005	0.2590	0.6390	0.0157	0.0038
PS	-0.15002	-0.34393	-0.20899	-0.37596	-0.27386	-0.20049	-0.26610	-0.27585
	0.2526	0.0071	0.1090	0.0031	0.0342	0.1245	0.0399	0.0329
INFO	-0.20523	-0.39377	-0.35593	-0.25744	-0.12327	-0.00795	-0.29757	-0.27484
	0.1157	0.0025	0.0053	0.0471	0.3481	0.9519	0.0209	0.0336
COMP	-0.24308	-0.20862	-0.14536	-0.20349	-0.23805	-0.02034	-0.33230	-0.16460
	0.0613	0.1097	0.2678	0.1189	0.0670	0.8774	0.0095	0.2088
ARITH	-0.03306	-0.25877	-0.14268	-0.30209	-0.04905	0.14956	-0.27844	-0.22864
	0.8020	0.0459	0.2768	0.0190	0.7098	0.2540	0.0312	0.0789
SIM	-0.05175	-0.31107	-0.13522	-0.41108	-0.19658	-0.12747	-0.17709	-0.36287
	0.6945	0.0156	0.3030	0.0011	0.1320	0.3318	0.1759	0.0044
DSP	0.12769	-0.00991	0.12627	-0.18553	-0.10702	0.05491	-0.00396	-0.04614
	0.3309	0.9401	0.3364	0.1558	0.4157	0.6769	0.9761	0.7263
VOC	-0.26437	-0.41921	-0.26081	-0.45023	-0.27946	0.03672	-0.31566	-0.49094
	0.0412	0.0009	0.0441	0.0003	0.0305	0.7806	0.0140	0.0001
DSY	-0.04300	-0.13806	0.00153	-0.26372	0.10086	-0.08390	0.02278	-0.23223
	0.7442	0.2928	0.9908	0.0417	0.4432	0.5239	0.8628	0.0742
PC	-0.16331	-0.24439	-0.21915	-0.17385	-0.26052	-0.27796	-0.37492	-0.27131
	0.2125	0.0599	0.0925	0.1840	0.0444	0.0315	0.0032	0.0360
BD	-0.04920	-0.31746	-0.27626	-0.23696	-0.21979	-0.17757	-0.16759	-0.14355
	0.7146	0.0135	0.0326	0.0683	0.0915	0.1747	0.2006	0.2739
PA	-0.17890	-0.16255	-0.09586	-0.18153	-0.16598	0.03386	-0.08706	-0.02747
	0.1714	0.2146	0.4662	0.1651	0.2050	0.7973	0.5083	0.8349
OA	-0.06417	-0.37833	-0.25745	-0.37718	-0.22167	-0.20724	-0.31283	-0.28979
	0.6262	0.0029	0.0471	0.0030	0.0887	0.1121	0.0149	0.0247

TABLE IV (Continued)

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	G	H	I	J	K	L	L1	L2
FS	-0.37881	-0.42148	-0.62657	0.00000	-0.16471	-0.74995	-0.63779	-0.61807
	0.0028	0.0008	0.0001	1.0000	0.2085	0.0001	0.0001	0.0001
VS	-0.26502	-0.39457	-0.55436	0.00000	-0.16545	-0.70873	-0.63057	-0.55056
	0.0399	0.0018	0.0001	1.0000	0.2037	0.0001	0.0001	0.0001
PS	-0.41978	-0.29988	-0.53513	0.00000	-0.10675	-0.58802	-0.46518	-0.52528
	0.0008	0.0199	0.0001	1.0000	0.4169	0.0001	0.0002	0.0001
INFO	-0.22673	-0.42199	-0.41325	0.00000	-0.25130	-0.45457	-0.42551	-0.32790
	0.0815	0.0008	0.0010	1.0000	0.0528	0.0003	0.0007	0.0105
COMP	-0.11186	-0.24831	-0.27109	0.00000	-0.19799	-0.32132	-0.30629	-0.22515
	0.3948	0.0557	0.0362	1.0000	0.1294	0.0123	0.0173	0.0837
ARITH	-0.20157	-0.29090	-0.43685	0.00000	-0.01964	-0.66415	-0.61972	-0.48144
	0.1225	0.0241	0.0005	1.0000	0.8816	0.0001	0.0001	0.0001
SIM	-0.28724	-0.47106	-0.58129	0.00000	-0.17103	-0.53659	-0.43754	-0.46477
	0.0261	0.0001	0.0001	1.0000	0.1914	0.0001	0.0005	0.0002
DSP	-0.16416	-0.20333	-0.28015	0.00000	0.15058	-0.49403	-0.48247	-0.33231
	0.2101	0.1192	0.0302	1.0000	0.2508	0.0001	0.0001	0.0095
VOC	-0.24399	-0.34960	-0.54172	0.00000	-0.20821	-0.59215	-0.56234	-0.41747
	0.0603	0.0062	0.0001	1.0000	0.1104	0.0001	0.0001	0.0009
DSY	-0.05343	0.01722	-0.32162	0.00000	-0.25567	-0.31877	-0.15992	-0.39615
	0.6851	0.8961	0.0122	1.0000	0.0486	0.0131	0.2222	0.0017
PC	-0.36001	-0.33657	-0.38696	0.00000	0.04097	-0.38279	-0.31375	-0.32961
	0.0047	0.0086	0.0023	1.0000	0.7560	0.0025	0.0146	0.0101
BD	-0.35873	-0.30348	-0.34539	0.00000	-0.19993	-0.47189	-0.42883	-0.35586
	0.0049	0.0184	0.0069	1.0000	0.1256	0.0001	0.0006	0.0053
PA	-0.08502	-0.19246	-0.18086	0.00000	0.10550	-0.32763	-0.20812	-0.35464
	0.5184	0.1407	0.1667	1.0000	0.4224	0.0106	0.1106	0.0054
OA	-0.38825	-0.20645	-0.48134	0.00000	-0.05284	-0.54119	-0.48449	-0.41690
	0.0022	0.1135	0.0001	1.0000	0.6885	0.0001	0.0001	0.0009

TABLE V

CORRELATIONS OF WAIS AND IP SCALE DATA FOR HIGH IQ GROUP

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 32

	IP	I	II	III	IV	A	B
FS	0.13739	0.20829	-0.02466	-0.21587	-0.36951	0.29801	-0.05001
	0.4533	0.2526	0.8934	0.2354	0.0374	0.0976	0.7858
VS	0.17157	0.25081	-0.05293	-0.23431	-0.46450	0.35790	-0.03208
	0.3478	0.1662	0.7736	0.1968	0.0074	0.0383	0.8616
PS	0.02054	-0.06453	0.08571	-0.00410	-0.00393	-0.06724	-0.06147
	0.9111	0.7257	0.6409	0.9822	0.9830	0.7149	0.7382
INFO	0.30552	0.07079	-0.10926	-0.41932	-0.36384	0.14622	-0.16333
	0.0891	0.7002	0.5517	0.0169	0.0407	0.4246	0.3718
COMP	0.15377	-0.08300	-0.04768	-0.02849	-0.17426	-0.05535	-0.10813
	0.4008	0.6515	0.7955	0.8770	0.3401	0.7635	0.5558
ARITH	0.12377	0.17876	-0.01999	-0.06857	-0.41361	0.47415	-0.10554
	0.4997	0.3276	0.9135	0.7092	0.0186	0.0061	0.5654
SIM	0.02760	0.16206	0.05695	-0.29349	-0.07049	0.26273	-0.00446
	0.8808	0.3755	0.7569	0.1030	0.7014	0.1463	0.9807
DSP	-0.16808	0.24968	0.18458	0.16854	-0.16562	0.37015	0.15646
	0.3578	0.1681	0.3119	0.3565	0.3650	0.0370	0.3925
VOC	0.44479	-0.11906	-0.13560	-0.28052	-0.50976	-0.01952	-0.06480
	0.0108	0.5163	0.4593	0.1199	0.0029	0.9156	0.7246
DSY	-0.11134	0.07113	0.02798	0.09156	0.06536	-0.01438	-0.01577
	0.5441	0.6989	0.8792	0.6182	0.7223	0.9377	0.9317
PC	0.09100	0.03631	-0.18775	-0.10610	-0.06398	-0.02124	0.00098
	0.6204	0.8436	0.3035	0.5633	0.7279	0.9081	0.9957
BD	0.03710	0.03529	-0.15902	-0.05515	-0.00176	0.03215	-0.10078
	0.8402	0.8479	0.3847	0.7643	0.9924	0.8613	0.5831
PA	0.11704	-0.10617	0.14221	-0.13337	-0.08863	0.06962	-0.13519
	0.5235	0.5630	0.4375	0.4668	0.6295	0.7050	0.4607
OA	0.08450	-0.04981	0.06672	0.07627	-0.20266	0.03751	-0.09886
	0.6456	0.7866	0.7167	0.6782	0.2660	0.8385	0.5903

TABLE V (Continued)

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 32	B1	B2	C	D	E	F
FS	0.08386	-0.21410	0.27989	0.23448	-0.13768	-0.11832
	0.6481	0.2393	0.1208	0.1965	0.4524	0.5189
VS	0.11262	-0.21909	0.28820	0.30803	-0.18120	-0.19990
	0.5394	0.2283	0.1097	0.0863	0.3210	0.2727
PS	-0.04355	-0.05943	0.00995	0.03190	0.06312	0.07410
	0.8129	0.7466	0.9569	0.8624	0.7314	0.6869
INFO	-0.19446	-0.04846	0.28095	0.10695	-0.06106	-0.27052
	0.2862	0.7923	0.1193	0.5602	0.7399	0.1343
COMP	-0.11042	-0.05753	0.03327	0.11981	-0.13824	-0.05045
	0.5474	0.7545	0.8565	0.5136	0.4505	0.7839
ARITH	0.07374	-0.30839	0.17238	0.36654	-0.26913	-0.07552
	0.6883	0.0859	0.3455	0.0391	0.1364	0.6812
SIM	0.08660	-0.12903	0.14336	0.17296	0.06125	-0.13093
	0.6375	0.4815	0.4338	0.3438	0.7391	0.4751
DSP	0.28253	-0.08731	0.00196	0.15680	0.09962	0.11569
	0.1172	0.6347	0.9915	0.3914	0.5875	0.5284
VOC	0.02370	-0.15936	-0.13176	0.34610	-0.21820	-0.37243
	0.8976	0.3836	0.4722	0.0523	0.2302	0.0358
DSY	-0.06237	0.05590	0.17955	0.05032	0.11289	-0.13459
	0.7345	0.7612	0.3255	0.7845	0.5385	0.4627
PC	-0.04054	0.05825	0.08941	-0.17009	-0.05761	-0.16267
	0.8256	0.7515	0.6304	0.3520	0.7541	0.3737
BD	-0.11711	-0.03390	0.19919	-0.30695	-0.07189	0.05861
	0.5233	0.8539	0.2744	0.0875	0.6958	0.7500
PA	-0.09963	-0.12533	-0.06599	0.17651	0.07038	0.04019
	0.5874	0.4943	0.7197	0.3339	0.7019	0.8271
OA	0.00000	-0.19289	0.01850	0.09492	-0.09518	0.17021
	1.0000	0.2902	0.9199	0.6053	0.6043	0.3517

TABLE V (Continued)

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 32

	G	H	I	J	K	L	L1	L2
FS	-0.13730	-0.11576	-0.00184	0.00000	-0.19810	-0.36351	-0.22728	-0.31483
	0.4537	0.5281	0.9920	1.0000	0.2771	0.0374	0.2109	0.0793
VS	-0.08778	-0.14101	-0.04811	0.00000	-0.20609	-0.46450	-0.37746	-0.29254
	0.6328	0.4414	0.7937	1.0000	0.2578	0.0074	0.0332	0.1041
PS	-0.12122	0.05168	0.07375	0.00000	-0.03994	-0.00393	0.09302	-0.11063
	0.5087	0.7789	0.6883	1.0000	0.8282	0.9830	0.6126	0.5467
INFO	0.10251	-0.37966	-0.11469	0.00000	-0.36995	-0.36384	-0.25589	-0.27393
	0.5765	0.0321	0.5320	1.0000	0.0371	0.0407	0.1575	0.1292
COMP	0.07484	0.06415	0.03538	0.00000	-0.21149	-0.17425	-0.13836	-0.11344
	0.6840	0.7272	0.8476	1.0000	0.2453	0.3401	0.4501	0.5365
ARITH	-0.08843	-0.03073	-0.08179	0.00000	0.01632	-0.41361	-0.36508	-0.22800
	0.6303	0.8674	0.6563	1.0000	0.9293	0.0186	0.0399	0.2095
SIM	-0.21314	-0.21892	-0.09200	0.00000	-0.11401	-0.07049	-0.00296	-0.10547
	0.2415	0.2287	0.6165	1.0000	0.5344	0.7014	0.9872	0.5656
DSP	-0.09533	0.08614	0.09758	0.00000	0.23149	-0.16562	-0.18526	-0.04737
	0.6038	0.6393	0.5952	1.0000	0.2024	0.3650	0.3101	0.7968
VOC	0.05278	-0.24578	-0.16915	0.00000	-0.18362	-0.50976	-0.41012	-0.32578
	0.7742	0.1751	0.3576	1.0000	0.3144	0.0029	0.0197	0.0688
DSY	0.24630	0.43878	-0.23900	0.00000	-0.35620	0.06536	0.13893	-0.05530
	0.1742	0.0120	0.1877	1.0000	0.0454	0.7223	0.4482	0.7637
PC	-0.13405	-0.21695	0.10273	0.00000	0.07261	-0.06398	0.12378	-0.23790
	0.4645	0.2330	0.5758	1.0000	0.6929	0.7279	0.4997	0.1898
BD	-0.14488	-0.04229	0.05896	0.00000	-0.00123	-0.00176	0.01571	-0.02038
	0.4289	0.8182	0.7485	1.0000	0.9947	0.9924	0.9320	0.9119
PA	-0.04706	-0.21917	0.03579	0.00000	0.00735	-0.08863	0.07393	-0.21991
	0.7981	0.2281	0.8458	1.0000	0.9681	0.6295	0.6876	0.2265
OA	-0.06763	0.00000	0.13344	0.00000	0.10755	-0.20266	-0.19553	-0.09300
	0.7131	1.0000	0.4666	1.0000	0.5579	0.2660	0.2835	0.6127

TABLE VI

CORRELATIONS OF WAIS AND IP SCALE DATA FOR LOW IQ GROUP

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 28

	IP	I.	II	III	IV	A	B
FS	0.76427	-0.56697	-0.45340	-0.59955	-0.63221	-0.07961	-0.55948
	0.0001	0.0017	0.0154	0.0008	0.0001	0.6872	0.0020
VS	0.58952	-0.45194	-0.29955	-0.42179	-0.53034	-0.20319	-0.45644
	0.0010	0.0133	0.1215	0.0254	0.0037	0.2997	0.0146
PS	0.62554	-0.44046	-0.43208	-0.52000	-0.52551	0.11959	-0.44552
	0.0004	0.0190	0.0217	0.0046	0.0041	0.5444	0.0175
INFO	0.41933	-0.59856	-0.18859	-0.33993	-0.07681	-0.41710	-0.50695
	0.0263	0.0008	0.3365	0.0777	0.6976	0.0272	0.0059
COMP	0.16824	-0.30990	-0.19034	-0.16427	0.10129	-0.24669	-0.11736
	0.3921	0.1086	0.3319	0.4035	0.6080	0.2057	0.5520
ARITH	0.39199	-0.21358	0.03741	-0.21574	-0.55313	-0.24984	-0.21277
	0.0449	0.2751	0.8501	0.2702	0.0023	0.1998	0.2770
SIM	0.50915	-0.33354	-0.28752	-0.55772	-0.38137	0.01864	-0.34695
	0.0058	0.0828	0.1379	0.0021	0.0452	0.9250	0.0706
DSP	0.33600	-0.04159	0.10330	-0.26726	-0.61065	0.05202	-0.00613
	0.0804	0.8336	0.6009	0.1692	0.0006	0.7926	0.9753
VOC	0.59429	-0.61308	-0.37814	-0.46368	-0.32768	-0.30914	-0.62205
	0.0009	0.0005	0.0472	0.0129	0.0887	0.1094	0.0004
DSY	0.24525	-0.00389	-0.09359	-0.26656	-0.36578	0.07820	-0.13320
	0.2094	0.9843	0.6354	0.1703	0.0555	0.6924	0.4992
PC	0.41913	-0.45554	-0.52185	-0.31153	-0.12890	-0.06488	-0.32328
	0.0264	0.0148	0.0044	0.1066	0.5133	0.7429	0.0933
BD	0.44179	-0.39249	0.03410	-0.39918	-0.38190	0.17898	-0.36331
	0.0189	0.0299	0.8632	0.0353	0.0449	0.3621	0.0574
PA	0.19433	-0.20235	0.00554	0.10809	-0.25653	-0.34133	-0.06017
	0.4034	0.3018	0.9777	0.5841	0.1873	0.0755	0.7610
OA	0.51692	-0.39244	-0.52338	-0.39572	-0.37012	0.14954	-0.47325
	0.0049	0.0389	0.0043	0.0371	0.0525	0.4473	0.0110

TABLE VI (Continued)

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 28

	B1	B2	C	D	E	F
FS	−0.30956	−0.63805	−0.42601	−0.51919	0.18343	−0.60471
	0.1089	0.0003	0.0238	0.0046	0.3501	0.0007
VS	−0.25580	−0.50309	−0.26834	−0.33446	0.20426	−0.47924
	0.1716	0.0064	0.1674	0.0819	0.2971	0.0099
PS	−0.25102	−0.50233	−0.41715	−0.49951	0.08039	−0.48934
	0.1976	0.0065	0.0272	0.0068	0.6843	0.0082
INFO	−0.50494	−0.28248	−0.39399	−0.09161	−0.06475	−0.21798
	0.0061	0.1453	0.0437	0.6429	0.7434	0.2651
COMP	−0.06103	−0.13899	−0.39233	−0.13385	−0.10037	−0.15870
	0.7577	0.4806	0.0389	0.4971	0.6113	0.4199
ARITH	−0.21410	−0.11571	−0.03376	0.05560	0.33804	−0.27169
	0.2740	0.5577	0.8646	0.7787	0.0785	0.1619
SIM	−0.14677	−0.45503	−0.26171	−0.31571	0.17197	−0.44259
	0.4561	0.0150	0.1785	0.1017	0.3816	0.0183
DSP	0.10064	−0.14403	−0.11452	−0.03355	0.35819	−0.10453
	0.6104	0.4647	0.5614	0.8654	0.0613	0.5965
VOC	−0.43378	−0.59137	−0.31023	−0.21000	0.08000	−0.60329
	0.0211	0.0009	0.1081	0.2835	0.6857	0.0007
DSY	0.13747	−0.43008	0.14091	−0.20302	0.26453	−0.25513
	0.4855	0.0223	0.4745	0.3001	0.1737	0.1901
PC	−0.32077	−0.18175	−0.52564	−0.45952	−0.32825	−0.31295
	0.0961	0.3546	0.0041	0.0117	0.0881	0.1049
BD	−0.34851	−0.22003	−0.46165	−0.03588	0.31168	−0.18651
	0.0691	0.2606	0.0134	0.8522	0.1064	0.3417
PA	−0.00497	−0.10594	−0.17877	−0.10523	0.09105	0.00671
	0.9800	0.5916	0.3627	0.5941	0.6450	0.9730
OA	−0.38114	−0.38257	−0.28507	−0.51097	−0.03978	−0.54046
	0.0454	0.0445	0.1415	0.0055	0.8407	0.0030

TABLE VI (Continued)

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 28

	G	H	I	J	K	L	L1	L2
FS	-0.11859	-0.25390	-0.69069	0.00000	-0.18451	-0.66221	-0.35485	-0.70621
	0.5476	0.1925	0.0001	1.0000	0.3473	0.0001	0.0563	0.0001
VS	0.11283	-0.21160	-0.51107	0.00000	-0.14367	-0.53034	-0.34132	-0.51821
	0.5676	0.2797	0.0055	1.0000	0.4658	0.0037	0.0755	0.0047
PS	-0.39313	-0.14911	-0.57555	0.00000	-0.15208	-0.52551	-0.23563	-0.61238
	0.0442	0.4489	0.0014	1.0000	0.4398	0.0041	0.2274	0.0005
INFO	-0.23506	-0.15162	-0.34949	0.00000	-0.07538	-0.07681	-0.03597	-0.08708
	0.2286	0.4412	0.0683	1.0000	0.7030	0.6976	0.8519	0.6595
COMP	0.17106	-0.19016	-0.10756	0.00000	-0.16798	0.10129	0.15839	0.00912
	0.3841	0.3324	0.5859	1.0000	0.3929	0.6080	0.4208	0.9633
ARITH	0.24355	-0.11906	-0.35000	0.00000	0.02907	-0.55313	-0.43893	-0.46052
	0.2117	0.5452	0.0679	1.0000	0.8833	0.0023	0.0195	0.0137
SIM	0.00826	-0.39339	-0.53782	0.00000	-0.22411	-0.38137	-0.19371	-0.42253
	0.9667	0.0384	0.0032	1.0000	0.2516	0.0452	0.3233	0.0251
DSP	0.10022	-0.27330	-0.31403	0.00000	0.10526	-0.61065	-0.56877	-0.42723
	0.6119	0.1594	0.1037	1.0000	0.5940	0.0006	0.0016	0.0234
VOC	-0.15597	-0.10158	-0.54173	0.00000	-0.24483	-0.32758	-0.28468	-0.24905
	0.4280	0.6070	0.0029	1.0000	0.2092	0.0887	0.1420	0.2012
DSY	-0.17326	-0.11979	-0.25433	0.00000	-0.11374	-0.36578	-0.06735	-0.51945
	0.3779	0.5438	0.1915	1.0000	0.5644	0.0556	0.7335	0.0046
PC	-0.30141	-0.10635	-0.39793	0.00000	0.10959	-0.12890	-0.08111	-0.12773
	0.1191	0.5983	0.0360	1.0000	0.5789	0.5133	0.6816	0.5172
BD	-0.26293	-0.19434	-0.24473	0.00000	-0.45903	-0.38190	-0.28673	-0.33370
	0.1764	0.3217	0.2094	1.0000	0.0140	0.0449	0.1391	0.0827
PA	0.20591	0.08958	-0.08744	0.00000	0.33014	-0.25668	-0.08571	-0.32744
	0.2932	0.6503	0.6582	1.0000	0.0852	0.1873	0.6646	0.0890
OA	-0.40986	0.03963	-0.49354	0.00000	-0.17059	-0.37012	-0.21948	-0.37971
	0.0303	0.8413	0.0076	1.0000	0.3954	0.0525	0.2618	0.0463

TABLE VII

2 X 2 X 2 ANOVA

SOURCE	DF	ANOVA SS	F VALUE	PR > F
SEX	1	736.70030074	3.27	0.0758
SCHOOL	1	853.65391838	3.79	0.0565
SEX*SCHOOL	1	224.50472595	1.00	0.3223
ID(SEX*SCHOOL)	56			
TEST	1	85.15990083	1.77	0.1888
SEX*TEST	1	5.98500662	0.12	0.7256
SCHOOL*TEST	1	229.65803603	4.77	0.0331
SEX*SCHOOL*TEST	1	0.50544024	0.01	0.9187
TEST*ID(SEX*SCHOOL)	56			

TABLE VIII

GROUP MEANS FOR THE 2 X 2 X 2 ANOVA

SEX	SCHOOL	TEST	N	SCORE
FEMALE	COLLEGE	FS	14	112.071429
FEMALE	COLLEGE	IP	14	113.797143
FEMALE	HIGH SCHOOL	FS	16	104.250000
FEMALE	HIGH SCHOOL	IP	16	98.244375
MALE	COLLEGE	FS	16	113.312500
MALE	COLLEGE	IP	16	115.705625
MALE	HIGH SCHOOL	FS	14	110.714286
MALE	HIGH SCHOOL	IP	14	105.886429

TABLE IX

3 X 2 X 2 ANOVA

SOURCE	DF	ANOVA SS	F VALUE	PR > F
SEX	1	778.55961225	2.85	0.0971
SCHOOL	1	1004.72771029	3.67	0.0604
SEX*SCHOOL	1	260.76873397	0.95	0.3331
ID(SEX*SCHOOL)	56			
TEST	2	40.42920111	0.34	0.7127
SEX*TEST	2	170.74334216	1.43	0.2425
SCHOOL*TEST	2	294.55483235	2.48	0.0887
SEX*SCHOOL*TEST	2	20.15184889	0.17	0.8444
TEST*ID(SEX*SCHOOL)	112			

TABLE X

GROUP MEANS FOR THE 3 X 2 X 2 ANOVA

SEX	SCHOOL	TEST	N	SCORE
FEMALE	COLLEGE	IP	14	113.797143
FEMALE	COLLEGE	PS	14	111.642857
FEMALE	COLLEGE	VS	14	111.142857
FEMALE	HIGH SCHOOL	IP	16	99.244375
FEMALE	HIGH SCHOOL	PS	16	104.500000
FEMALE	HIGH SCHOOL	VS	16	103.500000
MALE	COLLEGE	IP	16	115.705625
MALE	COLLEGE	PS	16	112.500000
MALE	COLLEGE	VS	16	112.625000
MALE	HIGH SCHOOL	IP	14	105.395429
MALE	HIGH SCHOOL	PS	14	108.285714
MALE	HIGH SCHOOL	VS	14	110.785714

TABLE XI

2 X 2 X 2 ANOVA WITH REGRESSION TRANSFORMATION OF IPFS

SOURCE	DF	ANOVA SS	F VALUE	PR > F
SEX	1	458.89141896	3.47	0.0676
SCHOOL	1	426.06873602	3.22	0.0779
SEX*SCHOOL	1	142.79384307	1.08	0.3030
ID(SEX*SCHOOL)	56			
TEST	1	14.78299682	0.63	0.4319
SEX*TEST	1	10.71937190	0.45	0.5030
SCHOOL*TEST	1	43.27730072	1.83	0.1810
SEX*SCHOOL*TEST	1	5.39586807	0.23	0.6343
TEST*ID(SEX*SCHOOL)	56			

TABLE XII

GROUP MEANS FOR THE 2 X 2 X 2 ANOVA WITH REGRESSION TRANSFORMATION OF IPFS

SEX	SCHOOL	TEST	N	SCORE
FEMALE	COLLEGE	FS	14	112.071429
FEMALE	COLLEGE	IPFS	14	112.650714
FEMALE	HIGH SCHOOL	FS	16	104.250000
FEMALE	HIGH SCHOOL	IPFS	16	103.120725
MALE	COLLEGE	FS	16	113.312500
MALE	COLLEGE	IPFS	16	113.831250
MALE	HIGH SCHOOL	FS	14	110.714286
MALE	HIGH SCHOOL	IPFS	14	107.814286

TABLE XIII

2 X 2 X 2 ANOVA WITH REGRESSION TRANSFORMATION OF IPVS

SOURCE	DF	ANOVA SS	F VALUE	PR > F
SEX	1	604.88819543	4.47	0.0390
SCHOOL	1	354.97187720	2.62	0.1111
SEX*SCHOOL	1	162.37274842	1.20	0.2782
ID(SEX*SCHOOL)	56			
TEST	1	0.42226349	0.01	0.9089
SEX*TEST	1	41.55083072	1.30	0.2590
SCHOOL*TEST	1	70.21239484	2.20	0.1439
SEX*SCHOOL*TEST	1	9.70833176	0.30	0.5837
TEST*ID(SEX*SCHOOL)	56			

TABLE XIV

GROUP MEANS FOR THE 2 X 2 X 2 ANOVA WITH REGRESSION TRANSFORMATION OF IPVS

SEX	SCHOOL	TEST	N	SCORE
FEMALE	COLLEGE	IPVS	14	112.660714
FEMALE	COLLEGE	VS	14	111.142857
FEMALE	HIGH SCHOOL	IPVS	16	103.120725
FEMALE	HIGH SCHOOL	VS	16	103.500000
MALE	COLLEGE	IPVS	16	113.831250
MALE	COLLEGE	VS	16	112.625000
MALE	HIGH SCHOOL	IPVS	14	107.814286
MALE	HIGH SCHOOL	VS	14	110.785714

TABLE XV

SUBSECTION-SECTION CORRELATION ANALYSIS
OF THE IP SCALE

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60					
	I		II		III
A	0.51143	D	0.58744	G	0.51613
	0.0001		0.0001		0.0001
B	0.84096	E	0.75017	H	0.71244
	0.0001		0.0001		0.0001
C	0.66515	F	0.70167	I	0.82292
	0.0001		0.0001		0.0001
				J	0.00000
					1.0000
				K	0.43896
					0.0005

TABLE XVI

ITEM-TOTAL CORRELATION ANALYSIS OF THE IP SCALE

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	IP		IP		IP
S236	0.19372	S247	0.51879	S258	0.00000
	0.1381		0.0001		1.0000
S237	0.30805	S248	0.37186	S259	0.50557
	0.0156		0.0034		0.0001
S238	0.53282	S249	0.50130	S260	0.00000
	0.0001		0.0001		1.0000
S239	0.50370	S250	0.35763	S261	0.52891
	0.0001		0.0050		0.0001
S240	0.32444	S251	0.64843	S262	0.54494
	0.0114		0.0001		0.0001
S241	0.51816	S252	0.00000	S263	0.51048
	0.0001		1.0000		0.0001
S242	0.37979	S253	0.44185	S264	0.43416
	0.0028		0.0004		0.0005
S243	0.47418	S254	0.49151	S265	0.41219
	0.0001		0.0001		0.0011
S244	0.20084	S255	0.00000	S266	0.57615
	0.1239		1.0000		0.0001
S245	0.30377	S256	0.25058	S267	0.40985
	0.0183		0.0535		0.0011
S246	0.30736	S257	0.05392	S268	0.42224
	0.0169		0.6824		0.0008
				S269	0.32483
					0.0113

TABLE XVII

ITEM-SECTION CORRELATION ANALYSIS OF THE IP SCALE

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	I		II		III		IV
S236	0.38932	S244	0.58744	S248	0.50000	S258	0.00000
	0.0021		0.0001		0.0001		1.0000
S237	0.39030	S245	0.75017	S249	0.54363	S259	0.53252
	0.0020		0.0001		0.0001		0.0001
S238	0.65263	S246	0.54684	S250	0.57255	S260	0.00000
	0.0001		0.0001		0.0001		1.0000
S239	0.51892	S247	0.49953	S251	0.63837	S261	0.49421
	0.0001		0.0001		0.0001		0.0001
S240	0.48031			S252	0.00000	S262	0.69568
	0.0001				1.0000		0.0001
S241	0.45641			S253	0.47905	S263	0.66487
	0.0002				0.0001		0.0001
S242	0.53003			S254	0.59820	S264	0.51203
	0.0001				0.0001		0.0001
S243	0.56035			S255	0.00000	S265	0.49650
	0.0001				1.0000		0.0001
				S256	0.36822	S266	0.66526
					0.0038		0.0001
				S257	0.25982	S267	0.45672
					0.0371		0.0002
						S268	0.52250
							0.0001
						S269	0.38635
							0.0023

TABLE XVIII

CORRELATION ANALYSES OF SUBSECTIONS B AND L

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO:RHO=0 / N = 60

	B		L
B1	0.86629	L1	0.86803
	0.0001		0.0001
B2	0.75157	L2	0.80300
	0.0001		0.0001

VITA 2

William Richard Picker

Candidate for the Degree of

Master of Science

THESIS: An Examination of the Intellectual Processes Scale of the Luria-Nebraska Neuropsychological Battery

Major Field: Psychology

Biographical:

Personal Data: Born in Union, New Jersey, December 17, 1956, the son of Eugene and Annette Picker. Married to Lois Berman, August 12, 1979.

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