AN ABSTRACT OF THE THESIS OF

Kristy K. Pauls _____ for the ___ Master of Science Degree _____
   (name of student)   (degree)

in _____ Psychology _____ presented on _____ July 20, 1994 ____
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Title: __A Correlational Study Among the Wechsler Adult Intelligence___

Scale - Revised, the Graduate Record Examination and Grade Point Average__

Abstract approved: _Cooper B. Holmes_____

The purpose of the study was to examine the relationships among the Graduate Record Examination (GRE) scores, Wechsler Adult Intelligence Scale-Revised (WAIS-R) scores, and undergraduate grade point average (UGPA) for the last 60 hours. Thirty clinical psychology graduate students from a regional, midwestern university were chosen. Their selection was based on the following criteria: 1) they must have been enrolled in the clinical psychology program at Emporia State University, 2) they must have a GRE score on file upon entering Emporia State University, and 3) they must **not** have taken or have been enrolled in the course PY 841 - Clinical Mental Tests II (The Wechsler scales).

After receiving permission from the Human Subjects Committee and each individual via a consent form, each subject was administered the Wechsler Adult Intelligence Scale-Revised (WAIS-R). The WAIS-R tests were administered by five examiners. Next, the subject's GRE scores and the last 60 hours of undergraduate study GPA were obtained. The WAIS-R administrator did **not** view the subject's UGPA or GRE scores in order to decrease potential examiner bias.

At the completion of the WAIS-R testing procedure, the total GPA, GRE and

WAIS-R results were utilized in a two step statistical process. First, Pearson product-moment correlation coefficients were calculated. Correlation coefficients ranged from .22 to .94. All variables were significantly correlated at the .05 or .01 level except UGPA with the GRE Quantitative section. Seven independent t-tests were done to yield information concerning gender differences. Statistical significance was not found among the 30 subjects on the seven variables.

A CORRELATIONAL STUDY AMONG

THE WECHSLER ADULT INTELLIGENCE SCALE - REVISED,

THE GRADUATE RECORD EXAMINATION,

AND GRADE POINT AVERAGE

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A Thesis

Presented to

the Division of Psychology and Special Education

EMPORIA STATE UNIVERSITY

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In Partial Fulfillment
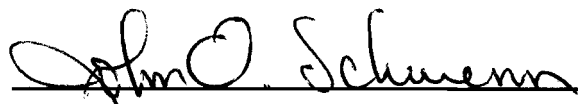
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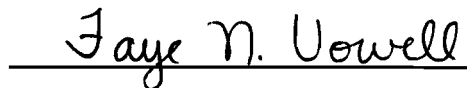
Master of Science

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by

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CHAPTER 1

INTRODUCTION

The importance of admissions criteria and their predictive validity for success in graduate school is immeasurable. Two popular objective assessment tools used in selective admissions are the Graduate Record Examination (GRE) and undergraduate grade point average (GPA). In terms of GPA, it is a more common practice to use the last 60 hours (UGPA). Much research has been conducted on both the GRE and UGPA to determine their usability in admissions criteria and predictive ability for success in graduate school (Broadus & Elmore, 1983; Harvancik & Golsan, 1986; Monahan, 1991; Noble, 1986; Wesche, Courtney, & Hausken, 1984).

The GRE and UGPA are not the only admissions and predictive tools traditionally utilized in higher education. Additional measures frequently include letters of recommendation and research experience (Purdy, Reinehr & Swartz, 1989). According to the results of a questionnaire study by Cashin and Landrum (1991), GRE scores were ranked as the most important admissions criteria. Yet, information gathered via a different questionnaire study by Oltman and Hartnett (1985) reported UGPA along with letters of recommendation as the most important admissions criteria. Although opposing views are evident, little, if any, information exists suggesting that GRE scores and UGPA are inadequate admissions criteria.

Traditional tools used for predicting academic success in graduate school include GRE scores, undergraduate grade point average, grades within the students' major, samples of students' writing, letters of recommendation, and the number of honors

(VIQ), Performance IQ (PIQ), and Full Scale IQ (FSIQ) (Kaufman, 1990; Wechsler, 1981). Since the WISC-R and the WAIS-R are significantly and highly correlated and contain most of the same subtests with similar, but not identical content, information would appear to be easily interchangeable.

Given the documented reliability of the WISC-R correlations with grade point averages and the WAIS-R in comparison to the WISC-R, a relationship may exist between the WAIS-R and college and university grade point average, more specifically UGPA. Because there is a positive relationship between UGPA and GRE scores, a relationship may also exist between the WAIS-R and GRE scores. Henceforth, the purpose of this study was to determine the relationships between the WAIS-R, GRE scores, and UGPA.

Previous Research

The most popular objective test utilized as an admissions criteria for graduate programs is the Graduate Record Examination (GRE) (Lannholm, 1967; 1971). The GRE was initially developed in 1949 and continues to be "the best documented instrument of its type" (Cohn, 1985, p. 624). The first restructuring process was in 1951. This revision included verbal (VGRE) and quantitative (QGRE) sections which are presently used (Cooksey & Stenning, 1981). A second revision was completed in 1977 by adding an experimental version of an analytic (AGRE) measure to the GRE general test (GRE guide, 1993; Wilson, 1985). In 1981, a revision updating the analytical section, which is presently used, was completed (GRE guide, 1993; Wilson, 1985).

The total test taking time is approximately three and one-half hours (Directory of Selected National Testing Programs, 1987). The test has six equal sections of 30 minute durations: two are verbal, two are quantitative, and two are analytical. A minimum score of 200 and a maximum score of 800 are possible for each of the three tests (Directory of Selected National Testing Programs, 1987; GRE guide, 1993; Monahan, 1991). The national averages, standard deviations, and reliability coefficients for all examinees taking the GRE general test reported by the Educational Testing Service (1993) are shown in Table 1. More specifically, a study conducted with master's level clinical psychology students by the Graduate Record Examination Board (GRE guide, 1993) cited the verbal ability mean as 504 with a standard deviation of 100, quantitative ability mean as 527 with a standard deviation of 112, and analytical ability mean as 555 with a standard deviation of 114.

The GRE general test, which does not relate to any specific field of study, is a measure of three abilities acquired over a long period of time (Cohn, 1985; Jaeger, 1985; Monahan, 1991). The three abilities assessed are verbal ability, mathematical ability, and analytical and logical reasoning ability (Monahan, 1991). The abilities are measured by the verbal, quantitative, and analytical sections (Directory of Selected National Testing Programs, 1987). The three sections are significantly correlated. The VGRE and QGRE correlate at .42; the VGRE and AGRE correlate at .65; and the QGRE and the AGRE correlate at .66. The three sections are also intended to have and maintain at least .90 reliability for total test scores (GRE guide, 1993). Specifically, the Graduate Record Examination Board (GRE guide, 1993)

Table 1

National Study: Examinees from October 1, 1989 - September 30, 1992

GRE General Test Sections	Mean	Standard Deviation	Reliability
VGRE	484	121	.90
QGRE	561	141	.92
AGRE	534	129	.88

reported a substantially high Kuder-Richardson formula (20) reliability for each section as follows: verbal ability = .90; quantitative ability = .92; and analytical ability = .88.

The verbal section consists of four item types: antonyms, analogies, sentence completion, and reading comprehension (GRE guide, 1993; Jaeger, 1985; Martinson, 1990). The four item types address individualized information, such as, the ability to identify words, to relate phrases, to correlate logically and stylistically within a sentence, and to recognize specific information in passages (Monahan, 1991).

The quantitative score is an indicator of the subject's knowledge of mathematics. It is composed of three item types: discrete quantitative questions, interpretive questions, and quantitative comparison questions (Monahan, 1991). These three components provide a balanced test of basic mathematical skills, the understanding of elementary mathematical concepts, and the ability to reason quantitatively and solve problems in a quantitative setting. Specifically, the test involves arithmetic, algebra and geometry (Jaeger, 1985; Monahan, 1991).

The experimental analytical test was revised to include two item types. The item types are analytical reasoning and logical reasoning (Monahan, 1991; Wilson, 1985). The analytical test is intended to assess the developed ability to reason with complex information (Duran, Powers & Swinton, 1987). It is used in the administration of the GRE as a test of cognitive skills that may be important to graduate study. Although the AGRE is administered, Duran, et al. (1987) reported the subtest is not used in admissions criteria or other areas, because there are few well-developed models or

theories to guide the measurement of analytical ability.

Although each section measures a specific ability, the GRE general test as a whole has few specific functions. Over the past 40 years, GRE scores have frequently been used to fulfill departmentally approved admission criteria (Clark, 1984; Cooksey & Stenning, 1981). Approximately one-third of colleges and universities either "require or recommend" scores in order to apply to their graduate programs (Cooksey & Stenning, 1981; Jaeger, 1985; Lannholm, 1971; Oltman & Hartnett, 1985). According to Martinson (1990), the GRE is "to provide a standard measure that will permit admission decisions to be based, at least in part, on an 'objective' comparison of all candidates - no matter what their college or background" (p. 3).

Not only are GRE scores used as objective criteria for the admissions process, but they are also used as tools to predict graduate success. As a predictive tool, the main goal of the GRE is to predict graduate grade point average. The GRE is also considered as another factor when offering assistantships, fellowships, or scholarships (Directory of Selected National Testing Programs, 1987; Oltman & Hartnett, 1985). Although GRE scores are considered in offering assistantships, fellowships, or scholarships, their primary function(s) remain(s) as admissions criteria and/or predictors of success in graduate school.

Many times, GRE scores are the only admissions criteria or predictor of academic success used. The GRE Board does not advise this type of solitary usage (Monahan, 1991). Conversely, the GRE Board advises departments to use the GRE

scores by relating what the tests measure to the specific graduate department programs (GRE guide, 1993). In support of the GRE Board's request, many researchers (Cartwright & Kunze, 1974; Cooksey & Stenning, 1981; Lannholm, 1968; Monahan, 1991; Oltman & Hartnett, 1985) reported GRE scores as good supplemental aids to undergraduate GPA, other admissions records, and departmental-specified qualifications for graduate school. Many also believe that based on conditions such as degree sought and to what particular department the individual may apply, the GRE is a good predictor of graduate level work in education (Cartwright & Kunze, 1974; Furst & Roelfs, 1979; Humphrey, 1965). Although some researchers support the use of the GRE as a predictor of graduate level work, Clark (1984) and Harvancik and Golsan (1986) reported being skeptical of the GRE being a valid admittance tool. Also, Wesche, Courtney, and Hausken (1984) believe even though GRE scores are good predictors of success, graduate schools admit or reject students on a very limited knowledge of the student's past performance and inappropriately judge potential graduate performance on past grades, standardized tests and letters of recommendation.

Another traditional tool used as an admissions criteria is undergraduate grade point average (Wesche et al., 1984). In the present investigation, UGPA will be defined as the grade point average for the last 60 hours of undergraduate study. According to a study by Purdy, Reinehr, and Swartz (1989), ideal graduate school admissions criteria include a combined GRE score, total undergraduate grade point average, with particular emphasis on the last 60 hours of undergraduate grade point

average, letters of recommendation, and research experience. In support of this view, Cartwright and Kunze (1974) stated UGPA is a positive aid in the majority of instances in admissions selection.

Undergraduate grade point average is also used as a predictor of academic success along with GRE scores, samples of the student's writing, letters of recommendation, number of honors earned and grades within the student's major (Kluever & Green, 1992). Noble (1986) and Cotton (1986) believe UGPA is a good predictive tool. Undergraduate grade point average is an especially good predictor when combined with GRE scores (Dennis, 1979; Furst & Roelfs, 1979; Humphrey, 1965; Jaeger, 1985). This point of view is supported by the researchers who have found GRE scores and UGPA to be significantly, but weakly correlated (Harvancik & Golsan, 1986; Monahan, 1991; Noble, 1986; Wesche et al., 1984). In a few studies, UGPA was found to be a better predictor or a more important predictor than GRE scores (Monahan, 1991; Noble, 1986; Oltman & Hartnett, 1985). Other research found GRE scores to be more important than UGPA (Cashin & Landrum, 1991; Jaeger, 1985). In opposition to the use of UGPA, Monahan (1991) concluded in his study that UGPA is not a good predictor in admissions criteria. Although views such as those expressed by Monahan exist, UGPA and GRE scores are consistently utilized in this capacity.

Undergraduate grade point average is not only used in correlational studies with GRE scores, but also with the Wechsler Intelligence Scales. The children's Wechsler Intelligence Scales along with other intelligence tests are related to achievement and

were developed to predict school success (Rodriguez & Prewitt-Diaz, 1990). Specifically, the Wechsler Intelligence Scale for Children-Revised (WISC-R) Full Scale IQs and grade point averages for children were found to correlate at .32 for black students and .42 for white students in a study conducted by Poteat, Wuensch and Gregg (1988). Also, in a study by Ruiz (cited in Rodriguez & Prewitt-Diaz, 1990), the Information subtest within the WISC-R was highly predictive of grade point average in children.

Another study by Sandoval, Sassenrath and Penaloza (1988) (cited in Kaufman, 1990) found significant correlations between the WISC-R and the Wechsler Adult Intelligence Scale-Revised (WAIS-R). The researchers documented correlations between the WISC-R and the WAIS-R as .96, .82, and .96 respectively on the Verbal IQ (VIQ), Performance IQ (PIQ), and Full Scale IQ (FSIQ) for individuals with learning disabilities. This pattern is a mirror of the correlation found by Wechsler for normal adolescents (Wechsler, 1981). These values strongly support the WAIS-R's validity for educational purposes.

Other reasons the WAIS-R may be usable in the educational field have been documented by Kaufman (1990) and Wechsler (1981). These researchers have found that for 16 year olds, the Wechsler Intelligence Scale for Children-Revised (WISC-R) and the WAIS-R Verbal, Performance and Full Scale IQs are correlated at .89, .76 and .88 respectively. In addition, the mean IQs were virtually identical, and they measure similar constructs across their respective ages. In a longitudinal, correlational study by Zimmerman, Covin and Woo-Sam (1986) (cited in Kaufman,

1990), the WISC-R and WAIS-R, for 16 year old referrals, were administered three to four years apart and yielded the following data: a) special education, referrals (whites) VIQ = .84, PIQ = .85, and FSIQ = .88, and 2); special education, referrals, (blacks) VIQ = .57, PIQ = .75, and FSIQ = .70. Since the WISC-R and the WAIS-R are significantly and highly correlated at .97 and contain most of the same subtests with similar, but not identical content, information would appear to be easily interchangeable.

Even though these correlations are obviously significant, Kaufman (1990) stated "the WAIS-R exceeds the WISC-R in its reliability of difference coefficients" (p. 115). A number of studies at the college level, cited in Frank (1983), have related the Wechsler IQ to grade point average. Researchers, cited in Frank (1983) (Anderson, 1942; Conry & Plant, 1965; Merrit & Heathers, 1953; Plant & Lynd, 1959; Wall et al., 1962; Sartain, 1946; Zung & Gianturco, 1968), found statistically significant correlations ranging from .30 to .60 when studies were performed between the Verbal IQ (VIQ) scale, derived from the Wechsler Adult Intelligence Scale (WAIS), and GPA. Kaufman (1990) stated "the use of the WAIS-R for predicting college achievement is likely to produce coefficients lower than the values in the .60s" (p. 19). Matarazzo (1985) reported a coefficient of .44 between WAIS Full Scale IQ and GPA for college students. Because Verbal IQ has been shown to relate strongly to grade point average and the WAIS is significantly correlated with grade point average, then it may be assumed the WAIS-R may also be an adequate predictor of grade point average (Frank, 1983).

The Wechsler Adult Intelligence Scale-Revised (WAIS-R) was developed as a basic intelligence test which may be used as a diagnostic tool and research instrument in various settings (Wechsler, 1981). "Although the [test] inevitably evaluate[s] a subject's cognitive abilities and may be used to appraise a subject's educational, vocational, or other competencies, these are not [its] primary intent" (Wechsler, 1981, p. 7).

The initial intelligence test developed by David Wechsler in 1939 was the Wechsler-Bellevue Intelligence Scale (Matarazzo, 1985). The Wechsler-Bellevue was revised in 1955 and renamed the Wechsler Adult Intelligence Scale (WAIS) (Kaufman, 1985). The presently revised, updated and renormed Wechsler scale is the Wechsler Adult Intelligence Scale-Revised (Matarazzo, 1985; Wechsler, 1981). It was published in 1981 by the Psychological Corporation (Kaufman, 1985).

This newly revised psychometric device is specifically designed to measure major mental abilities. The established purpose of this "criterion of adult intelligence" (Kaufman, 1985) test was to establish and reflect the overall capacity for intelligent behavior (p. 1703). Specifically, 11 tests, which are organized into 6 verbal and 5 nonverbal (performance) subtests are used to measure mental abilities. Each individual subtest is arranged in an ascending order of difficulty. The 11 subtests are to be administered in a systematic order. The total testing time requires approximately 75 to 90 minutes. Each subject receives three scores: a Verbal IQ score (VIQ), a Performance IQ score (PIQ) and a Full Scale IQ score (FSIQ), as well as individual subtest scores. The WAIS-R has ". . . the same average of 100 and

standard deviation of 15 for every age group" (Wechsler, 1981, p. 9). The individual

subtests have a mean of 10 and a standard deviation of three (Wechsler, 1981).

Standardization of the WAIS-R was a meticulous, four year (1976-1980) process

to ensure representativeness of the entire population (Kaufman, 1985). "The total

sample . . . was carefully stratified on the variables of sex, race, geographic region,

occupational group, educational attainment, and urban-rural residence" (Kaufman,

1985, p. 1702). Nine age groups from 16 years, 0 months to 74 years, 11 months

were designated with equal numbers of males and females representing each group

(Wechsler, 1981).

The Verbal IQ score (VIQ) derived from the six verbal subtests reflects

"crystallized intelligence" (Kaufman, 1979, p. 28). The six subtests within the VIQ

are Information, Digit Span, Vocabulary, Arithmetic, Comprehension and

Similarities. Verbal IQ is specifically "left brain, semantic activity which is

dependent on past learning, direct and deliberate training and education" (Moore,

Weare, & Leonard, 1987, p. 65).

The Performance IQ score (PIQ) represents "fluid intelligence" (Kaufman, 1979,

p. 28). Specifically, PIQ is "right brain activity" involving ". . . problem solving or

adaptation and flexibility when faced with unfamiliar stimuli and reflects incidental

learning" (Moore, et al., 1987, p. 65). The five subtests involved are Picture

Completion, Picture Arrangement, Block Design, Object Assembly, and Digit Symbol

(Wechsler, 1981). The composite score derived from the WAIS-R is the Full Scale

IQ (FSIQ).

In the academic setting of graduate school, time is of the essence. Decisions need to be made accurately and quickly. Therefore, the importance of excellent admissions criteria and predictive validity for success in graduate school is immeasurable. The two popular objective admission assessments, GRE scores and UGPA, are, at best, moderately successful predictors of success (Cohn, 1985). Clark (1984) stated "grades earned by graduate students are predicted only partially by the traditional admissions criteria of test scores and undergraduate grades" (p. 30). Also, Cotton (1986) stated GRE scores and UGPA are overemphasized in the context of admissions criteria. Unless other career-oriented factors are considered in selection, the professions may soon find themselves with serious shortfalls of satisfied, competent individuals (Dennis, 1979). Therefore, if both GRE scores and UGPA are suspect in the academic setting, having another tool in the area of admissions criteria and predictive ability for success in graduate school may be useful.

The WAIS-R may be just that tool. Since most standardized tests used as admissions criteria and predictive tools have been criticized as not being fair, particularly to special populations, the WAIS-R, which is normed on a diverse population, may be a helpful tool in the areas of admissions criteria and predicting success in graduate school (Kaczmarek & Franco, 1986). It is easily administered and many individuals may have an Wechsler FSIQ on file. If there is not an IQ on file, the WAIS-R can be speedily administered in 75 to 90 minutes, approximately two hours faster than the administration of the GRE. If this study were to find significant correlations between the WAIS-R and GRE or UGPA, it may be that the

WAIS-R is a possible admissions and/or predictive tool for graduate school success in addition to the GRE and UGPA.

Males and females have been known to yield vastly different scores on various tests in the past. Therefore, these particular variables may yield significant differences between males and females involved in graduate school. Indeed, several studies have indicated significant gender differences concerning the GRE scores. Cooksey and Stenning (1981) discovered females score significantly higher on the VGRE and males score significantly higher on the QGRE. Kaczmarek and Franco (1986) supported the finding, that the QGRE score is significantly in favor of males. Additionally, Kaczmarek and Franco discovered a significant correlation between QGRE and undergraduate grade point average for women, but very low correlations were found between the GRE scores and UGPA for men. Given the importance of gender differences reported in previous research, this investigation, included comparative analyses of the scores obtained by male and female participants.

In conclusion, there are many viewpoints concerning the proper use of GRE scores and UGPA. Also, the use of the WAIS-R as an admissions criteria and/or predictor of success in graduate school appears not to have been considered. The purpose of this study was to explore the relationships between WAIS-R scores and GRE scores and WAIS-R scores and the last 60 hours of undergraduate grade point average (UGPA). The relationship between GRE scores and UGPA (last 60 hours) was also explored. The study investigated the use of WAIS-R scores, GRE scores, and UGPA as valid admissions criteria of clinical psychology students in graduate

school in a regional, midwestern university. In addition, gender differences based on

WAIS-R scores, GRE scores and UGPA were examined.

CHAPTER 2

METHOD

Subjects

The sample consisted of 30 Caucasian (9 males, 21 females) clinical psychology graduate students, currently attending a regional, midwestern university. Three criteria were used in selecting subjects: 1) enrollment in the clinical psychology masters degree program at Emporia State University, 2) notation of a GRE score on file in the division office upon entering Emporia State University, and 3) having not yet enrolled in the course PY 841 - Clinical Mental Tests II (the Wechsler Scales). Participation was completely voluntary. An added incentive for participants was the opportunity to become familiar with the WAIS-R administration procedures for future use in their field of study. Because of the lack of ethnic diversity within the university and the voluntary status, there was a lack of ethnic diversity within the sample.

The names of the subjects were not listed to insure confidentiality. The subjects were identified by code number only. To further ensure confidentiality, group scores rather than individual scores were reported.

Variables

This study contained seven data score variables. From the GRE, each subject received a verbal score (VGRE), a quantitative score (QGRE) and an analytical score (AGRE). From the WAIS-R, each subject received a Verbal (VIQ), Performance (PIQ), and Full Scale IQ (FSIQ) score. Finally, each subject had an undergraduate

grade point average score representing the last 60 hours of undergraduate work completed.

Procedure

The WAIS-R was administered to each subject individually. Each subject was given all 11 subtests. Standardized procedures were followed in the administration of the WAIS-R. All WAIS-R tests were given in designated testing rooms available in the psychology building at the university. In order to minimize examiner bias, a random selection process, matching the five WAIS-R administrators with the various subjects, was implemented. Each administrator was given the subject's name and phone number in order to set up a convenient time to administer the WAIS-R. The five administrators were second year graduate students trained in WAIS-R administration. Each administrator was approved and supervised by the same university instructor who teaches the Wechsler course.

The next step required the subjects to release their three Graduate Record Examination scores, the VGRE, QGRE and AGRE, and their undergraduate grade point averages, specifically the last 60 hours (UGPA). To decrease potential examiner bias, the five administrators of the WAIS-R did **not** view the subject's GRE scores or UGPA prior to the administration of the WAIS-R.

Each participant signed a participation consent form prior to testing, agreeing to take the WAIS-R and to release his/her GRE scores and undergraduate grade point average. The participation consent form was reviewed and accepted by the Human Subjects Committee before any testing took place. Additionally, test scores were

reported and explained to the subjects if requested.

<u>Statistical Design</u>

The study yielded seven scores for each subject: three scores for the GRE, three scores for the WAIS-R, and one for the undergraduate grade point average. Standard deviations and means were computed for males, females, and the total sample. The data were analyzed by seven independent t-tests to determine statistically significant differences between males and females utilizing WAIS-R scores, GRE scores and undergraduate grade point average. Also, the Pearson product-moment correlation coefficient (r) was used to assess the relationships between the three GRE scores and the three WAIS-R scores, the three GRE scores and UGPA, and the three WAIS-R scores and UGPA. They were analyzed at the .05 level of significance.

CHAPTER 3

RESULTS

The purpose of the study was to determine the relationships among the Graduate

Record Examination (GRE), the Wechsler Adult Intelligence Scale-Revised

(WAIS-R), and the undergraduate grade point average, specifically the last 60 hours

of undergraduate work. The GRE yielded three scores, the Verbal (VGRE),

Quantitative (QGRE) and Analytical (AGRE). The WAIS-R also yielded three scores,

the Verbal (VIQ), Performance (PIQ), and Full Scale IQs (FSIQ). The undergraduate

grade point average (UGPA) was a single score. A total of seven variables were

recorded for each of the 30 subjects. The means and standard deviations for each

variable are presented in Table 2.

The Pearson product-moment correlation coefficients were obtained among the

GRE, WAIS-R, and UGPA for the 30 subjects. Table 3 indicates the correlations

between the seven variables. The correlations ranged from .22 to .94. The UGPA

correlated poorly with the WAIS-R Performance score (PIQ) (r = .22). Except for

the poor correlations between UGPA and VGRE, and UGPA and PIQ, all variables

correlated significantly at the .05 or .01 level.

Seven independent t-tests were performed utilizing the seven variables to examine

gender differences. Table 4 indicates there were no statistically significant differences

found among the 30 subjects. Due to the drastic difference in the number of males

verses females, a random sample of 9 subjects was drawn from the 21 females. This

random sample procedure was performed to adjust for the possible bias which

Table 2

Descriptive Statistics for the GRE, WAIS-R and UGPA for Thirty Clinical

Psychology Graduate Students

Variable	M	SD	Range
GRE			
Verbal	464.33	70.35	280-610
Quantitative	464.67	110.48	310-710
Analytical	517.67	105.56	280-710
WAIS-R			
Verbal	109.67	9.39	91-126
Performance	110.27	12.13	87-130
Full Scale	111.50	11.70	88-130
UGPA	3.52	.32	2.92-4.00

Table 3

Correlation Coefficients Among the Seven Variables for Thirty Clinical Psychology
Graduate Students

	VGRE	QGRE	AGRE	UGPA	VIQ	PIQ	FSIQ
VGRE	-	.40*	.39*	.31	.73**	.46**	.63**
QGRE		-	.65**	.40**	.71**	.58**	.71**
AGRE			-	.37*	.57**	.40*	.52**
UGPA				-	.53**	.22	.42*
VIQ					-	.72**	.94**
PIQ						-	.91**
FSIQ							-

* $p < .05$.   ** $p < .01$.

VGRE = Verbal Graduate Examination Score

QGRE = Quantitative Graduate Examination Score

AGRE = Analytical Graduate Examination Score

UGPA = Last 60 hours Undergraduate Grade Point Average

VIQ = Verbal Intelligence Quotient

PIQ = Performance Intelligence Quotient

FSIQ = Full Scale Intelligence Quotient

Table 4

Seven Independent *t*-tests for Thirty Clinical Psychology Graduate Students

Variables	Number of Cases	Mean	Standard Deviation	Standard Error	T Value	2-tail Probability
VGRE						
Males	9	444.44	87.77	29.26	-.88	.40
Females	21	472.86	61.98	13.53		
QGRE						
Males	9	491.11	135.96	45.32	.75	.47
Females	21	453.33	99.36	21.66		
AGRE						
Males	9	494.44	140.10	46.70	-.66	.53
Females	21	527.62	89.21	19.47		
UGPA						
Males	9	3.35	.29	9.61	-2.08	.05
Females	21	3.60	.31	6.72		
VIQ						
Males	9	108.33	12.25	4.08	-.43	.68
Females	21	110.24	8.16	1.78		
PIQ						
Males	9	110.78	15.77	5.26	.13	.90
Females	21	110.05	10.66	2.33		
FSIQ						
Males	9	111.00	14.92	4.97	-.13	.90
Females	21	111.71	10.45	2.28		

may occur due to the difference in males (N=9) verses females (N=21). The 9

males and 9 females' scores were then utilized in performing the seven independent t-

tests. Again, no statistically significant differences were found among the 18

subjects. Therefore Table 4 is sufficient and no additional information is necessary

for the 18 subjects.

CHAPTER 4

DISCUSSION

Graduate Record Examination (GRE) scores and undergraduate grade point average (UGPA) have been used for years as admissions criteria and predictors of success in graduate school. Because the validity of these two tools have been questioned, the use of the Wechsler Adult Intelligence Scale-Revised (WAIS-R) as a new admissions criterion and/or predictor of success in graduate school may be useful.

The present study indicated the WAIS-R Verbal score (VIQ), Performance score (PIQ), and Full Scale score (FSIQ) correlated with the GRE scores, verbal (VGRE), quantitative (QGRE) and analytical (AGRE) and UGPA. The Verbal score (VIQ) correlated significantly at the .01 level with the VGRE, QGRE, AGRE scores and UGPA. It was also significantly correlated with the PIQ and, as expected, with the FSIQ at the .01 level. The Performance score (PIQ) was significantly correlated at the .05 level with the AGRE score. It also correlated significantly with the VGRE, QGRE, VIQ, and FSIQ scores at the .01 level. Undergraduate grade point average and PIQ were not significantly correlated. The Full Scale score significantly correlated, at the .05 level, with UGPA. The VGRE, QGRE, AGRE, VIQ, and PIQ correlated significantly with FSIQ at the .01 level. Therefore, the study indicated the WAIS-R significantly correlates with two traditional admissions criteria/predictors of success. Since the seven variables are respectively correlated, it can be assumed the WAIS-R can be used as an admissions criterion along with GRE scores and UGPA.

Also within the study, independent t-tests were performed to examine any significant differences among gender. As the study indicated, there were no significant differences between scores obtained by males and females on the seven variables.

Because there was such a large discrepancy between the number of males verses females, the scores of nine females were randomly selected and compared to the scores for the nine males in the sample. This analysis was conducted to discover if a bias was caused by the difference in numbers of males and females. The individual t-tests conducted for the 18 subjects indicated no significant differences between genders. Therefore, the validity of the seven independent t-tests performed with the 30 subjects was supported.

There are some obvious extraneous variables which could not be accounted for that may have affected the results of the study. Because the subjects within this study were from a single university, additional data are needed in order to generalize this data to an entire population of graduate clinical psychology students.

The majority of subjects fell into the reference age group (20 to 24). This could also be unrepresentative of the population of graduate students. The fact that more non-traditional students are entering graduate school makes it evident this sample may not be totally representative of the graduate student population.

Another possible extraneous variable may be examiner errors. Although an effort was made to hold examiner errors to a minimum by following standardized procedures, one cannot account for individual differences in the administration of the

WAIS-R by the five administrators of the test.

Additionally, introductory exposure to the WAIS-R in undergraduate and/or graduate classes is possible. Professors may introduce the Wechsler Intelligence Scales to their classes for informational purposes. Therefore, the subjects may have previously been exposed to the test, consequently possibly affecting the results of this study.

According to the National Study (Educational Testing Service, 1993) mentioned earlier, this particular sample's scores on the three GRE sections are below the national norms for clinical psychology students at the master's level. For VGRE, the national norm was reported as 484 while the present study indicates 464, a 20 point difference. On the QGRE section, the national norm was reported as 561 while the present study indicates 465, a difference of 96. The national norm for AGRE was reported as 534 while the present study indicated 518, a 16 point difference. Because this sample scored below the national norms, the sample may not be representative of the nation's population of clinical psychology students.

This investigation supports results obtained in the Directory of Selected National Testing Programs (1987). The Directory reported the VGRE and QGRE as correlating at .42, VGRE and AGRE correlating at .65 and QGRE and AGRE correlating at .66. The present study indicated similar results when correlating VGRE with QGRE (.40) and QGRE with AGRE (.65). There is, however a large difference between the two studies among the relationships between VGRE and AGRE. While the Directory reported a .65 correlation between VGRE and AGRE, this study

indicated a correlation of .39. Since these results appear to be similar to the national norms reported by the Educational Testing Service, yet not identical, there is reason to doubt the representativeness of the sample population.

Although this study indicated strong relationships among the GRE scores, WAIS-R scores, and UGPA, the results of this study are not conclusive. Replication of this study should be conducted using a sample more representative of the graduate student population. If further research yields results similar to this study, the WAIS-R may be utilized by universities as a valid admissions criterion. To determine if the WAIS-R would be a valid predictor of graduate success, future studies should conduct a follow up correlational study comparing the subjects' final graduate grade point averages with the GRE scores, WAIS-R scores and UGPA.

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APPENDIX A

Participation Consent Letter

APPENDIX A

Participation Consent Letter

Please read this participation letter carefully. You are invited to participate in a study investigating the relationships between the Wechsler Adult Intelligence Scale-Revised (WAIS-R), the Graduate Record Examination (G.R.E.), and Grade Point Average (G.P.A.) (last 60 hours). The individuals involved in the study are psychology majors in pursuit of a Master's degree. The selection criteria are: (1) current enrollment as a graduate student in clinical psychology at Emporia State University and (2) non-enrollment in any graduate class pertaining to the administration of the Wechsler Adult Intelligence Scale-Revised (PY 841).

Your participation will require approximately 75 to 90 minutes for the administration of the WAIS-R and the submission of your GRE scores and your G.P.A. (last 60 hours) to the researcher. If the subject desires, he/she may learn his/her scores on the WAIS-R. Your scores will remain confidential. Anonymity will be preserved, and only group scores will be reported.

Participation in this study is completely voluntary. If you wish to terminate your participation, your may do so at any point in the study. There is no risk or discomfort involved in completing the study. The **benefits** from your participation are the experience of being involved in a thesis study and the introduction to the administrative procedure of the WAIS-R before you enroll in PY 841.

If you would like to volunteer, please contact **Kristy Pauls, (316) 341-5383.** You may set up an appointment at the time you call. If you call for an appointment, please retain your consent form and bring it to your appointment. Otherwise, you may return the bottom portion of this consent form to **Kristy Pauls, The Teachers College, Box 4036, Emporia State University, Emporia, KS 66801** and you will be contacted to set up an appointment.

If you have any additional questions or comments about this study, feel free to contact Kristy Pauls, Visser Hall 209, 341-5383 or Mr. Howard Carvajal, Division of Psychology and Special Education, 323 Visser Hall, 341-5280.

Thank you for your participation.

- -

I,_____ , have read the above information and wish to
      (please print name)

participate in this study. I understand that my participation is voluntary and that I may withdraw at any time without prejudice after signing this form should I choose to discontinue participation in this study. I understand that all information will be reported in a group format in order to provide confidentiality.

_____   _____
(signature of Participant)   (date)

_____   _____
(signature of Experimenter)   (date)

APPENDIX B

Human Subjects Committee Form

APPENDIX

APPLICATION FOR APPROVAL TO USE HUMAN SUBJECTS

This application should be submitted, along with the Informed Consent Document, to the Institutional Review Board for Treatment of Human Subjects, Research and Grants Center, Campus Box 4048.

1. Name of Principal Investigator(s) or Responsible Individuals:

   Kristy K. Anderes

2. Departmental Affiliation: Psychology and Special Education

3. Person to whom notification should be sent: Kristy K. Anderes

   Address: 502 Union, Emporia, KS 66801

4. Title of Project: A Correlational Study Among the Wechsler Adult Intelligence Scale-Revised, Graduate Record Examination and Grade Point Average

5. Funding Agency (if applicable): Not Applicable

6. Project Purpose(s):
   Administration of the Weschler Adult Intelligence Scale-Revised resulting in a measure of the correlational properties among the WAIS-R, the Graduate Record Examination and Grade Point Average.

7. Describe the proposed subjects: (age, sex, race, or other special characteristics, such as students in a specific class, etc.)
   Subjects will be current clinical psychology majors. They will not have taken the class pertaining to the administration of the Wechsler.

8. Describe how the subjects are to be selected:

   Volunteers will be utilized.

9. Describe the proposed procedures in the project. Any proposed experimental activities that are included in evaluation, research, development, demonstration, instruction, study, treatments, debriefing, questionnaires, and similar projects must be described here. **Copies of questionnaires, survey instruments, or tests should be attached.** (Use additional page if necessary.)

   Subjects will be administered the WAIS-R. Standardized testing procedures will be strictly followed in accordance with the testing manual. The Graduate Record Examination score and the Grade Point Average will be submitted by the subjects.

10. Will questionnaires, tests, or related research instruments not explained in question #9 be used?
_____Yes __X__No   (If yes, attach a copy to this application.)

11. Will electrical or mechanical devices be used? _____Yes __X__No (If yes, attach a detailed description of the device(s).)

12. Do the benefits of the research outweigh the risks to human subjects? __X__Yes _____No This information should be outlined here.

The benefits of the research are academically focused. There is no risk to the subjects.

13. Are there any possible emergencies which might arise in utilization of human subjects in this project?
_____Yes __X__No Details of these emergencies should be provided here.

14. What provisions will you take for keeping research data private?

After data is collected, the scores will be reported in a group format as opposed to individual scores. This will insure confidentiality of individual scores. However, if the subject desires to learn his or her results, the examiner agrees to provide them.

15. Attach a copy of the informed consent document, as it will be used for your subjects.

STATEMENT OF AGREEMENT: I have acquainted myself with the Federal Regulations and University policy regarding the use of human subjects in research and related activities and will conduct this project in accordance with those requirements. Any changes in procedures will be cleared through the Institutional Review Board for Treatment of Human Subjects.

_____
Signature of Principal Investigator

11-1-93
Date

_____
Signature of responsible individual
(faculty advisor)

11-1-93
Date

TO: All Graduate Students Who Submit a Thesis or Research Problem/Project as Partial Fulfillment of The Requirements for an Advanced Degree

FROM: Emporia State University Graduate School

I, _____ Kristy K. Pauls _____, hereby submit this thesis/report to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may make it available for use in accordance with its regulations governing materials of this type. I further agree that quoting, photocopying,, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying which involves potential financial gain will be allowed without written permission of the author.

_____
Signature of Author

July 15, 1994 _____
Date

A Correlational Study Among the
Wechsler Adult Intelligence
Scale - Revised, the Graduate Record
Examination and Grade Point Average
Title of Thesis/Research Project

_____
Signature of Graduate Office Staff
Member

_____
Date Received

Distribution: Director, William Allen White Library
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