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THE ACCURACY OF SELF-ESTIMATION OF
READING SKILLS AS A FUNCTION OF THE
EXTROVERSION-INTROVERSION DIMENSION
OF PERSONALITY.

The University of Oklahoma, Ph.D., 1975
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THE UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

THE ACCURACY OF SELF-ESTIMATION OF READING SKILLS AS
A FUNCTION OF THE EXTROVERSION-INTROVERSION
DIMENSION OF PERSONALITY

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
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degree of
DOCTOR OF PHILOSOPHY

BY
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Norman, Oklahoma

1975

THE ACCURACY OF SELF-ESTIMATION OF READING SKILLS AS
A FUNCTION OF THE EXTROVERSION-INTROVERSION
DIMENSION OF PERSONALITY

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CHAPTER I

THE PROBLEM: ITS BACKGROUND AND SCOPE

Introduction

A pervasive view of educators is to develop individual potentialities of students. Learning to recognize and develop individual differences is viewed as having great significance for the organization of our educational efforts. Zeran and Riccio pointed out that

. . . a dynamic society demands an educational environment and a program which affords all boys and girls the opportunity to develop to their optimum. It also demands that they utilize their potentials to the benefit of themselves and society.¹

Identification of individuals' abilities and potentialities is important in our society. Standardized ability testing and self-estimates of ability have been instrumental in identifying abilities in various areas. Mischel has noted that an individual's self-ratings have been shown to be a highly valid assessment procedure.² Self-estimates have been

¹Franklin R. Zeran and Anthony C. Riccio, Organization and Administration of Guidance Services (Chicago: Rand McNally, 1962), p. 1.

²Walter Mischel, Personality and Assessment (New York: John Wiley and Sons, Inc., 1968).

utilized in assessing cognitive variables. Young obtained a correlation of .71 between freshmen college students' estimates of grades and actual grades.³ Artley, Burton, and Cook found that freshman college of education students were not always accurate estimators of their reading skill ability. Means of the underestimator were significantly higher than the overestimator not only on the Cooperative Reading Test, but on all criterion measures of academic and scholastic aptitude, such as grade point average, used in the study.⁴ Performance and self-estimation have also been related to the personality dimension of extroversion-introversion and to self-concept. In a study by Rankin, introverts scored significantly higher than extroverts on reading comprehension tests.⁵ Vingoe found introverts to be more accurate estimators than extroverts in the self-estimation of their position on an extroversion-introversion continuum.⁶ Does this same ability apply to the reading skills area? In dealing

³F. Young, "College Freshmen Judge Their Own Scholastic Promise," The Personnel and Guidance Journal 32(1954): 399-403.

⁴A. Sterl Artley, R.L. Burton, and Dawn Cook, "Perceived Versus Measured Reading Skills," Journal of Reading 16(1973): 319-323.

⁵Earl F. Rankin, "Reading Test Performance of Introverts and Extroverts," New Developments in Progress and Procedure for College and Adult Reading, in Twelfth National Reading Conference Yearbook (Milwaukee: National Reading Conference, Inc., 1963), pp. 158-166.

⁶F.J. Vingoe, "Validity of the Eysenck Extraversion Scale as Determined by Self-ratings in Normals," British Journal of Social and Clinical Psychology 5(1966): 89-91.

with self-estimates of ability, the role of self-concept is addressed in the theoretical base. This study investigated the accuracy of self-estimation of reading skills as a function of the extroversion-introversion dimension of personality.

Statement of the Problem

The problem was to determine whether significant differences existed between raw score means on the extroversion-introversion scale (E scale) of college engineering students classified as accurate estimators, overestimators, or underestimators of ability in each skill of reading comprehension, reading rate, and reading vocabulary.

Purpose of the Study

A student's accuracy of self-estimation of reading skills, whether he is an accurate estimator, overestimator, or underestimator, may be a function of the extroversion-introversion personality dimension. The purpose of this study was to determine if this phenomenon existed. If the phenomenon can be identified, individualization of treatment of reading skills could possibly be enhanced.

Hypotheses

The following major null hypotheses were tested:

H_{01} : There are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading comprehension.

H_{O_2} : There are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading rate.

H_{O_3} : There are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading vocabulary.

Definition of Terms

For the purpose of this study, the following terms were associated with the meaning given in the definition.

Estimated Accuracy Levels. These are percentile comparisons of the estimated levels and measured performance levels for each reading skill area. Measured performance level percentiles are based on the national norms for American college students.

Accurate Estimator: One whose measured performance percentile level is within fifteen percentile points of the estimated performance percentile level.

Overestimator: One whose measured performance percentile level is at least sixteen percentile points lower than the estimated performance percentile level.

Underestimator: One whose measured performance percentile level is at least sixteen percentile points higher than the estimated performance percentile level.

Procedure

Subjects

The sixty-nine students who served as subjects of the study were American University of Oklahoma male engineering students enrolled in engineering core courses during the 1975 summer

school term. Their ages ranged from 18.6 to 50.5 years with a mean age of 24.1 years. Sixty of the students were from Oklahoma with nine being from out-of-state. Twenty-three were admitted directly from high school, twenty-five were transfer students, seventeen were former students at the university, and four were former transfer students. Years since high school graduation ranged from one to thirty-three years. Fifty-five of the students were in the College of Engineering, three in the College of Arts and Sciences, eight in University College, one each in the Graduate College and College of Environmental Design, and one as a Special Student. The students involved were in various majors of engineering, with no one major dominating the field. The cumulative grade point average was 2.8 with a range of 1.1 to 4.0. The students came from towns ranging in size from one thousand to 840,000 people.

Description of the Instruments

Nelson-Denny Reading Test, Form C

This test provides a measure of three reading skills: reading comprehension, reading rate, and reading vocabulary. The test is designed for use in grades nine through sixteen. Working time is thirty minutes plus whatever time is needed for distribution and collection of the test materials and giving directions. Form C of the Nelson-Denny Reading Test was standardized in 1973 on a nationwide representative

sampling of over 15,600 grade nine through twelve students, and over 3,500 college students. The test serves predictive, screening, and broadly diagnostic purposes. The Nelson-Denny Reading Test can be used with other predictors of academic success for improved predictive value. A multiple correlation of .61 between this test, high school rank, and the Minnesota Scholastic Aptitude Test was reported.

There are three subtests of the Nelson-Denny Reading Test. The following is a description of tests of reading comprehension, reading rate, and reading vocabulary.

The reading comprehension subtest provides a broad sampling of subject matter areas. The format consists of an opening passage of sufficient length to measure reading rate, followed by seven shorter passages of two hundred words each. The questions reflect literal and reflective levels of thinking. A reliability coefficient of .83 was reported for grade fourteen. Testing time is twenty minutes.

The reading rate subtest determines rate by a one-minute reading of the initial comprehension passage. Students are asked to indicate the number of the line they were reading at the end of one minute, then to continue reading. The Flesch readability formula showed the passage to be suitable for eighth or ninth grade use and to be understood by eighty-three percent of the adults in this country.

The reading vocabulary subtest items were devised to

discriminate at all levels. Focus is on words of common current usage as found in materials from periodicals and books normally read at the high school and post-high school level. A reliability coefficient of .97 was reported for grade fourteen. Testing time is ten minutes.⁷

Eysenck Personality Inventory (EPI)

The inventory measures two independent personality dimensions: extroversion-introversion (E) and neuroticism-stability (N). Each trait is measured by means of twenty-four questions, selected on the basis of item and factor analysis, to which the examinee answers "Yes" or "No." The form can be administered in ten minutes. The test can be used in educational, industrial, clinical, and experimental settings. Test-retest reliability is between .84 and .94 for the complete test. A .86 split-half reliability was also reported. The correlation between the EPI and age is -.24. Factorial validity has confirmed extroversion-introversion as a second-order factor as cited in the literature. Correlation of scales of the California Psychological Inventory and the E Scale are positive for Social Presence, Self-Acceptance, Sociability, and Dominance (.60, .59, .53, and .45, respectively).

The following is a description of the extroversion-introversion dimension of personality. These are considered

⁷James I. Brown, M.J. Nelson, and E.C. Denny, The Nelson-Denny Reading Test, Examiner's Manual (Boston: Houghton Mifflin Company, 1973).

as end-points of a continuum to which real people may approach to a greater or lesser degree.

Extraversion-Introversion. High E scores are indicative of extraversion. High scoring individuals tend to be outgoing, impulsive and uninhibited, having many social contacts and frequently taking part in group activities.

The typical extravert is sociable, likes parties, has many friends, needs to have people to talk to, and does not like reading or studying by himself. He craves excitement, takes chances, often sticks his neck out, acts on the spur of the moment and is generally an impulsive individual. He is fond of practical jokes, always has a ready answer, and generally likes change. He is carefree, easygoing, optimistic, and likes to "laugh and be merry." He prefers to keep moving and doing things, tends to be aggressive and to lose his temper quickly. His feelings are not kept under tight control, and he is not always a reliable person.

The typical introvert is a quiet, retiring sort of person, introspective, fond of books rather than people; he is reserved and distant except to intimate friends. He tends to plan ahead, "looks before he leaps," and distrusts the impulse of the moment. He does not like excitement, takes matters of everyday life with proper seriousness, and likes a well-ordered mode of life. He keeps his feelings under close control, seldom behaves in an aggressive manner, and does not lose his temper easily. He is reliable, somewhat pessimistic, and places great value on ethical standards.⁸

Self-Estimate Form of Reading Skills

This investigator-developed form is a self-estimate of a student's abilities in three reading skills: reading comprehension, reading rate, and reading vocabulary. The student compares his abilities in the three reading skills to other students at the university by providing a percentile

⁸H.J. Eysenck and Sybil B.G. Eysenck, Eysenck Personality Inventory, Manual (San Diego: Educational and Industrial Testing Service, 1968).

ranking. The form takes two to three minutes to complete. Appendix A contains the self-estimate forms used in the study.

Pilot Study

This section discusses the development of the Self-Estimate Form of Reading Skills and the justification for the design of the study. The pilot study was conducted during the 1975 Spring semester at the University of Oklahoma.

The Self-Estimate Form of Reading Skills developed through several testings and revisions. The original form required students to rank themselves in quartiles appropriate for each reading skill. Ten engineering students were used to determine the validity of the self-estimate form. Each student was asked to complete the form which was followed by a tape-recorded interview in which the investigator asked each student his self-estimate on each of the three reading skills. A comparison of the taped-interviews with the results of the self-estimate form indicated that all ten students understood the concept of ranking themselves and that the directions were clear. Appendix B displays the initial test form. The self-estimate form was revised because it did not allow for sufficient discrimination of the students' perceived reading abilities. The first revision is shown in appendix C. The investigator tape-recorded interviews with eight engineering students using the revised form. The

students indicated the directions were confusing but that they understood the concept of ranking themselves after several readings. Through the comments and suggestions made on the last two forms, three primary changes were made. First, students were to compare themselves with other students at the university rather than to other engineers. Second, the percentile ranking changed from a forced choice to a free choice in determining percentile ranking. Third, three variations of the presentation of skills were provided to avoid bias in the initial meaning of each skill. The form was tested for validity using nine engineering students. Every student in the tape-recorded interview indicated an understanding of the concept of ranking.

The design of the study is based on two pilot studies conducted during the 1975 Spring semester. The initial Self-Estimate Form of Reading Skills and the Eysenck Personality Inventory were administered in an engineering core course composed of ten students, six Americans and four foreign. The American students completed the two forms within ten minutes, and the foreign students within twenty minutes. During the following class period, the Nelson-Denny Reading Test, Form C, was administered to seven of the original ten students. Experiences from the first administration of the test battery led the investigator to eliminate the foreign students from the study because of their difficulties with the English language. The first revision of

the self-estimate form was used with another engineering class of twenty-four students. The results were statistically treated using the first revised Self-Estimate Form of Reading Skills, the Eysenck Personality Inventory, and the Nelson-Denny Reading Test, Form C. Because of the small sample size, the data were limited in its value in drawing conclusions. However, the procedure for the treatment of the data provided direction for this process. A chi-square test was used to determine whether the frequency of responses was equally distributed among the three estimation levels. The obtained chi-square value was significant only for vocabulary at the .05 level. The calculated value tends to be distorted and an overestimation when any one expected cell frequency is less than five. The results of the test are presented in table 1. A one-way analysis of variance (ANOVA) was used in analyzing the data for each skill. The results of the ANOVA showed significance for reading vocabulary. No significant difference was found between mean E scale scores for comprehension and rate. Summary of the results are presented in table 2. When the means of the E scores for vocabulary were inspected, the accurate estimator scored lower on the E scale than the overestimator (accurate estimator mean = 9.8, overestimator mean = 16).

Collection of the Data

Prior to testing, permission was obtained from each of seven instructors for using the students in their classes.

Table 1.--Observed and Expected Frequencies of Subjects
in Each Estimation Level

	N	Estimator Levels						Chi Square
		Accurate		Over		Under		
		O*	E	O	E	O	E	
Reading Comprehension	13	7	4.3	3	4.3	3	4.3	2.5
Reading Rate	14	3	4.7	8	4.7	3	4.7	3.6
Reading Vocabulary	13	5	6.5	8	6.5	-	-	7.1**

*O--observed frequencies, E--expected frequencies.

**Significant at the .05 level.

Table 2.--ANOVA Summary Table for Three Reading Skills

Source	SS	df	MS	F
Reading Comprehension				
Between	.7	2	.4	1.0
Within	3.6	10	.4	
Total	4.3	12		
Reading Rate				
Between	.2	2	.1	.2
Within	6.4	11	.6	
Total	6.6	13		
Reading Vocabulary				
Between	118.3	1	118.3	11.5*
Within	112.8	11	10.3	
Total	231.1	12		

*Significant at the .05 level.

All the testing was conducted by the investigator. At the beginning of each hour class period, the students were told that this was a study dealing with three reading skills (comprehension, rate, and vocabulary) of American college engineering students. Any foreign students in the class were excused at that time from taking the test. The students were instructed to complete the Self-Estimate Form of Reading Skills and the Eysenck Personality Inventory within the first fifteen minutes of class. These forms were returned to the investigator. Instructions followed for the Nelson-Denny Reading Test, Form C. All forms were collected at the end of the allotted time. The additional data which follows were secured from the Office of Admissions and Records: cumulative grade point average, name of home town, resident status, college, major, year of high school graduation. American College Testing scores were available only on those students who entered directly from high school. This information was not included as part of the analysis in this study.

Treatment of the Data

From the results of the self-estimate form and the standardized reading test, the students were classified as either accurate estimators, overestimators, or underestimators in each of the three skills. A chi-square statistic based on the assumption of equal frequency of responses for each estimation level per skill was rejected at the .05 level

of significance. The obtained χ^2 's for comprehension, rate, and vocabulary were, respectively, 11.04, 13.65, 17.3, $df = 2$. This indicated that the responses per cell were not evenly distributed. A one-way ANOVA was used in analyzing the dependent variable, the E score, for each reading skill. Prior to the analysis, a covariance model was investigated for controlling five variables: age, population size of home town, years since high school graduation, grade point hours, and cumulative grade point average. In a two-step procedure which involved a multiple linear regression analysis followed by an ANOVA on the error of the regression, neither the multiple correlation coefficient nor the partial correlation coefficients were significant at the .05 level of significance. The variables accounted for little of the variance. This justified using the one-way ANOVA analysis eliminating the effect of these variables on the dependent variable. Correlation coefficients were found for each of the estimator levels on the following variables: estimated performance percentile on each reading skill, measured performance percentile on each skill, and E score.

CHAPTER II

THEORETICAL BASIS AND REVIEW OF THE LITERATURE

Introduction

This chapter is designed to familiarize the reader with the theoretical basis and research related to this investigation in the areas of self-estimation of ability and the extroversion-introversion dimension of personality, with particular interest in the reading skills area. The discussion will be presented as follows:

1. Theoretical basis for self-estimation.
2. Theoretical basis for extroversion-introversion.
3. Research on self-estimation of ability and extroversion-introversion.

Theoretical Basis for Self-Estimation

The theoretical basis for studying self-estimation of ability in this study was based on the self-concept theory. The nature, development, and dimension of the self-concept will be discussed. Sherif and Sherif regarded the self-concept as

. . . a developmental formation in the psychological make-up of the individual consisting of interrelated attitudes which are acquired in relation to his own body, to objects, family, persons, groups, social values, and institutions and which define and

regulate his relatedness to them in concrete situations.⁹

James has provided much of the derivation of self-concept theory. As pointed out by Hall and Lindzey,

James defined the self or the Empirical Me in its most general sense as the sum total of all that a man can call his--his body, traits, and abilities; his material possessions; his family, friends, and enemies; his vocation and avocations and much else.¹⁰

Hall and Lindzey go on to state that among self theorists, the term "self" has come to have two distinct meanings:

The first meaning may be called the subject-as-object definition since it denotes the person's attitudes, feelings, perceptions, and evaluations of himself as an object. In this sense, the self is what the person thinks of himself. The second meaning may be called the self-as-process definition. The self is a doer, in the sense that it consists of an active group of processes such as thinking, remembering, and perceiving.¹¹

The self-as-object definition will be referred to as the self-concept in this study.

There are numerous theorists who have contributed to the development of the self-concept theory framework. Mead, a social philosopher, provided a symbolic interaction theory of psychology hypothesizing that a child's self-perception is acquired during interaction with significant others who hold expectations about the nature of behavior

⁹ Muzafer Sherif and Carolyn W. Sherif, An Outline of Social Psychology (New York: Harper and Brothers, 1956), p. 581.

¹⁰ Calvin S. Hall and Gardner Lindzey, Theories of Personality (New York: Wiley, 1957), p. 467.

¹¹ Ibid., p. 468.

which is considered appropriate for the child. Mead's self-as-object implies that at first there is no self because a person cannot enter his own experience directly. The person experiences other people as objects, but initially does not regard himself as an object. The person learns to think of himself as an object and to have attitudes and feelings about himself as other people react to the person as an object, and reactions are experienced by the person against whom they are directed. Mead's self is a socially formed self as the person responds to himself as others respond to him. The importance of developing the ability to take the attitude of another is stressed when Mead stated that "he becomes a self insofar as he can take the attitude of another and act toward himself as others act." Many selves, Mead suggested, may develop, each of which represents a more or less separate set of responses acquired from different social groups. Examples of such varied selves that may develop are a family-self which represents a structure of attitudes expressed by his family, a school-self which represents attitudes expressed by his teachers and fellow pupils. Mead felt the role of significant others was important in the child's self-concept.¹²

Snygg and Combs stated that behavior is best understood as growing out of the individual's frame of reference

¹²George Mead, Mind, Self, and Society (Chicago: University of Chicago Press, 1934).

and that the child learns what he perceives he is able to learn.¹³ Hilgard stated that the study of self is essential to provide a complete understanding of the Freudian ego defense mechanisms. He pointed out that all of these defense mechanisms imply a self reference:

To feel guilty is to conceive of the self as an agent capable of good and bad choices. It thus appears that at the point that anxiety becomes infused with guilt feelings, self-reference enters. If we are to understand a person's defenses against guilt feelings, we must know something about his image of himself.¹⁴

The self concept, to Hilgard, may exist in varying levels of awareness, ranging from conscious to unconscious.

Rogers, another prominent theorist, noted the significance of self-concept while researching the client-centered approach in psychotherapy. The social self is formed in interaction with others.

As a result of interaction with the environment, and particularly as a result of evaluation interaction with others, the structure of self is formed--an organized, fluid, but consistent conceptual pattern of perception of characteristics and relationships of the "I" or the "me," together with the values attached to these concepts.¹⁵

Rogers pictured the self as possessing a strain toward organization, consistency, and conceptual patterning,

¹³Donald Snygg and Arthur W. Combs, Individual Behavior (New York: Harper and Brothers, 1949).

¹⁴E.R. Hilgard, "Human Motives and the Concept of Self," in The Study of Personality, ed: H. Brand (New York: Wiley, 1954), p. 350.

¹⁵Carl R. Rogers, Client-Centered Therapy: It's Current Practice, Implications and Theory (Boston: Houghton-Mifflin, 1951), p. 498.

although also possessing a certain fluidity. Fluidity is expressed as "the self and personality emerg~~ing~~ing from experience, rather than experience being translated or twisted to fit a preconceived self structure."¹⁶

In summary of the theoretical basis of self-concept presented, the self-as-object may be expressed as follows: Through interaction with the environment, and especially with others, there emerges a self-concept. This self-concept is composed of the person's feelings and attitudes toward the perceptions and evaluations of himself as an object. As the person develops the ability to take the attitude of another in perceiving himself, his self-concept emerges. The self-concept may be regarded as an overall structure consisting of several substructures possessing a definite organization, conceptual patterning, consistency as well as a certain fluidity. Varying levels of awareness exist in self-concept, and there is a constraining tendency to enhance or defend the self.

Theoretical Basis for Extroversion-Introversion

Extroversion-introversion has been identified as a basic dimension of personality.¹⁷ Several definitions of the

¹⁶ Association for Supervision and Curriculum Development, Perceiving, Behaving, Becoming: A New Focus for Education (Washington, D.C.: Association for Supervision and Curriculum Development, NEA, 1962), p. 26.

¹⁷ H.J. Eysenck, Dimensions of Personality (London: Kegan, Paul, Trench, Trubner, 1947).

the term have been offered. In brief, Conklin defined extroversion as "a more or less prolonged condition in which attention is controlled by the objective conditions of attention more than by the subjective and in which the content of the subjective conditions is most closely related to the objective." Summarizing introversion, Conklin defined this term as "a more or less prolonged condition in which attention is controlled more by the subjective than by the objective conditions and in which the content of the subjective conditions is of a more abstract nature and not so intimately related to the objective conditions."¹⁸ Jung's formulation of the dimension is as follows:

Extraversion is an outward-turning of libido. I use this concept to denote a manifest relation of subject to object, a positive movement of subjective interest toward the object. Everyone in the extraverted state thinks, feels, and acts in relation to the object, and moreover in a direct and clearly observable fashion, so that no doubt can remain about his positive dependence on the object. In a sense, therefore, extraversion is a transfer of interest from subject to object. If it is an extraversion of thinking, the subject thinks himself into the object; if an extraversion of feeling, he feels himself into it. In extraversion there is a strong, if not exclusive determination by the object. Extraversion is active when it is intentional, and passive when the object compels it, i.e., when the object attracts the subject's interest of its own accord, even against his will. When extraversion is habitual, we speak of the extraverted type.

Introversion means an inward-turning of libido, in the sense of a negative relation of subject to object. Interest does not move towards the object but withdraws

¹⁸ Edmund Conklin, "The Definitions of Introversion, Extroversion and Allied Concepts," Journal of Abnormal and Social Psychology 17(1923): 376-377.

from it into the subject. Everyone whose attitude is introverted thinks, feels, and acts in a way that clearly demonstrates that the subject is the prime motivating factor and that the object is of secondary importance. Introversion may be intellectual or emotional, just as it can be characterized by sensation or intuition. It is active when the subject voluntarily shuts himself off from the object, passive when he is unable to restore to the object the libido streaming back from it. When introversion is habitual, we speak of an introverted type.¹⁹

Wells used the term introversion to denote the avoidance of unpleasant external effort by seeking satisfaction within the self, in imagery and day-dreaming. Introversion, to Wells, is one of the ways in which unpleasant experiences are avoided.²⁰ Kempf described the introvert as moody, self-conscious, irritable, eccentric, cautious and deliberative, and uncreative. They belong to the "shut-in" type in which "fear of permitting the affect /of/ free play, such as curiosity, friendliness, love seeking, prevents it from attaining practical contact with reality and the environment, and forces it to use endogenous forms of counterstimulation, as day-dreams, imaginations, hallucinations, etc." The extrovert will, by inference, possess the opposing characteristics.²¹ Myers defined the attitude in the following way:

¹⁹ C.G. Jung, The Collected Works of C.G. Jung, eds. Sir Herbert Read, Michael Fordham, Gerald Adler, and William McGuire, vol. 6: Psychological Types (Princeton, New Jersey: Princeton University Press, 1971): 427, 452-453.

²⁰ F.L. Wells, Mental Adjustments (New York: D. Appleton and Company, 1920).

²¹ The Autonomic Functions and the Personality, quoted in May Freyd, "Introverts and Extroverts," Psychological Reviews 31(1924): 77.

The introvert's main interests are in the inner world of concepts and ideas, while the extravert's main interests are in the outer world of people and things. Therefore, when circumstances permit, the introvert directs both perception and judgment upon ideas, while the extravert likes to direct both upon his outside environment. . . .²²

Eysenck summarized the definitions by stating that "(a) the introvert has a more subjective, the extrovert a more objective outlook; (b) the introvert shows a higher degree of cerebral activity, the extrovert a higher degree of behavioral activity; (c) the introvert shows a tendency of self control (inhibition), the extrovert a lack of such control."²³ Eysenck's full description of the terms is given under the description of the instruments in the text of this study.

The psychological theories which underlie the causes of extroversion and introversion are varied. Tansley stated that "the process of extroversion is the primitive biological function of the mind. Biologically the mind and its powers only have significance so far as they can be used in life. They were developed in relation to the world in which the organism lived and their nature was determined . . . by the environment of the species, to which they are intimately adapted. The process of introversion is primarily a lack of such adaption."²⁴ McDougall concluded that the tendencies

²²I.B. Myers, The Myers-Briggs Type Indicator, Manual (Princeton, New Jersey: Educational Testing Service, 1962): 576.

²³Eysenck, Dimensions.

²⁴A.G. Tansley, The New Psychology (New York: Dodd, Mead and Company, 1923), p. 88.

are inherited.²⁵ Kempf accounted for introversion by the effects of the social structure and the conflict with self-cravings.²⁶ Causes for the various behavioral characteristics of extroversion-introversion are viewed by Eysenck as a function of a postulated cortical excitation-inhibition balance. The theory may be stated in three parts. Respectively, this deals with the general law, the postulation of individual differences, and the typological postulate. The general law, based on Hull's sub-molar principle of "reactive inhibition," is thusly stated:

A. Whenever any stimulus-response connection is made in an organism (excitation), there also occurs simultaneously a reaction in the nervous structures mediating this connection which opposes its recurrence (inhibition).

The postulation of individual differences, based on Pavlov's "internal inhibition," is stated below:

B. Human beings differ with respect to the speed which reactive inhibition is produced, the strength of reactive inhibition and the speed with which reactive inhibition is dissipated. These differences themselves are properties of the physical structures involved in the evocation of responses.

The following is the typological postulate:

C. Individuals in whom reactive inhibition is generated quickly, in whom strong reactive inhibitions are generated and in whom reactive inhibition is dissipated slowly are thereby predisposed to develop extraverted patterns of behavior and to develop hysterical disorders in cases of neurotic breakdown; conversely, individuals in whom reactive inhibitions are generated and in whom reactive

²⁵William McDougall, Is America Safe for Democracy? (New York: C. Scribner's Sons, 1921).

²⁶The Autonomic Functions and the Personality.

inhibition is dissipated quickly, are thereby predisposed to develop introverted patterns of behavior and to develop dysthymic disorders in cases of neurotic breakdown.²⁷

The concept of "excitation" refers to an increase in the conductivity of certain links between the conditioned stimulus and response in the central nervous system, and increased through reinforcement. "Inhibition" is a kind of neural fatigue which is produced on the occurrence of a response in the nervous system. Both processes are active and counteract each other. The excitation process makes the transmission of the impulse easier, and the inhibition makes the process more difficult. Inhibition dissipates more quickly than excitation.

Research on Self-Estimation and Extroversion-Introversion

Research that has been closely related to the preceding theoretical framework of self-concept and the extroversion-introversion dimension of personality has utilized self-estimates of ability for various purposes. The following review will discuss relevant research conducted with self-estimation, to include studies of the estimation abilities of extroverts and introverts. The review will be concluded with additional research on extroversion-introversion, with added emphasis in the reading skills area.

²⁷H.J. Eysenck, "Cortical Inhibition, Figural After-effect and Theory of Personality," Journal of Abnormal and Social Psychology 51(1955): 94-106.

The complexity of forming an estimation is enormous. Bowen indicated that "the individual has formed some sort of psycho-social judgmental scale on which he cannot only rank himself, but on which he can also rank those with whom he interacts and make comparisons of their ability with his own." He stated that everyone has formed many such scales on which he daily ranks and compares himself and others.²⁸ The use of self-reports has been shown to be a highly valid assessment procedure.²⁹ Research has been conducted on the accuracy and nature of self-estimates of ability. Wylie pointed out that the trend in various studies is towards a self-favorability bias, a trend towards self-overestimation rather than self-underestimation.³⁰

Arsenian's landmark study in the use of self-estimates was based on the importance of a realistic evaluation of strength and weaknesses in connection with the decision to enter college. Self-estimates of ability were compared to objective measurements for a group of 125 entering freshmen male students at Springfield College in

²⁸Collin Weldon Bowen, "The Use of Self-Estimates of Ability and Measures of Ability in the Prediction of Academic Performance" (Ed.D. dissertation, Oklahoma State University, 1968), p. 20.

²⁹Walter Mischel, Personality and Assessment (New York: John Wiley and Sons, Inc., 1968).

³⁰Ruth C. Wylie, "Children's Estimates of Their Schoolwork Ability as a Function of Sex, Race, and Socio-economic Level," Journal of Personality 31(1963): 203-224.

Massachusetts. The factors selected which related to the success of a college career were scholastic aptitude (as measured by the American Council Psychological Examination), achievement in common subjects (as measured by The Cooperative English Test and The Cooperative General Culture Test), adjustment (as measured by the Bell Adjustment Inventory), and vocational interests (as measured by the Strong Vocational Interest Blank). Students were asked to rate themselves in comparison with entering college freshmen nation-wide. Ratings were obtained on a six-point scale as follows: lowest 10%, between 10-25%, between 25-50%, between 50-75%, between 75-90%, and the top 10%. For analysis, the two positions on either end of the scale were combined so that the analysis was actually carried out on the basis of quartiles. Arsenian was interested in how close the freshman's own estimate of his abilities in the four areas were to objective measurement of those same attributes. Of interest in the present study is the results of the initial ratings and test scores for the Cooperative English subtests which are given in table 3. From the results of all the self-estimates and objective measurements, Arsenian concluded that the self-estimates do not correspond highly with the actual possession of the attributes. The self-estimates of ability were also given after taking the tests and there was a revision of self-estimates downward. The variability of the estimate continued to be large, although more in the direction of the correct placement

TABLE 3.--Arsenian's Comparison of Self-estimates Obtained Before Testing and Cooperative English Test Results

Name of Test	Self-Ratings	N	Mean	S.D.	Corrected Contingency Coefficient
Usage	100-75	11	51.36	8.79	.27
	75-50	64	48.83	6.36	
	50-25	47	46.94	7.96	
	25- 0	3	42.33	8.35	
Spelling	100-75	19	56.79	9.81	.38
	75-50	54	50.12	10.02	
	50-25	36	43.84	8.70	
	25- 0	16	34.63	7.92	
Vocabulary	100-75	8	68.00	10.24	.57
	75-50	63	58.71	8.76	
	50-25	45	50.20	6.99	
	25- 0	9	43.60	7.44	

by the tests. Arsenian was also interested in the characteristics of students who grossly overrated or underrated themselves. Whenever the differences between a student's own self-estimate and the test score was one quartile or more, it was counted as an overestimate or underestimate depending upon the direction of the difference. From this definition, there were 165 overestimates and 101 underestimates for all the tests given. To investigate the characteristics of the students with gross over-under estimates, thirteen students with five or six over-under estimates were compared with fifteen students who had made no over-under estimates. These two groups were compared with reference to age, scores on the psychological examination, and the Bell Adjustment Inventory. Results of these findings are reported

in table 4. No conservative level of significance was found

TABLE 4.--Comparison of Groups with No Over-Under Estimates and Those with 5-6 Over-Under Estimates

Item for Comparison	Group	N	Mean	S.D.	"t" Test
Age	0	15	19.47	1.05	.89
	5-6	13	19.26	.73	
Psychological Examination	0	15	81.20	21.58	1.20
	5-6	13	71.92	17.16	
Bell-Home	0	15	2.60	2.33	1.71
	5-6	13	4.31	2.76	
Bell-Health	0	15	3.73	2.57	1.78
	5-6	13	6.38	4.83	
Bell-Emotional	0	15	6.40	3.24	1.20
	5-6	13	8.92	7.00	

for any of the results. Individual analysis was also made of the background and academic records of every student included in the two groups. The summary of the case studies of the two groups is presented in table 5. Arsenian concluded from

TABLE 5.--Summary of Case Studies of Groups with No Over-Under Estimates and Those with 5-6 Over-Under Estimates

Item for Comparison	0 Group		5-6 Group	
	N	%	N	%
Second trial at college-----	2	15
On prescription during freshman year----	1	7	4	30
Dismissal or admised not to return at end of year-----	2	13	3	23
Personality problem--maladjusted-----	7	54
Good student-----	11	73	1	8

separate case studies that the students with no gross over-under estimates were more strongly motivated, their stated vocational objectives were in greater harmony with the pattern of interests shown on the Strong Blank, the ratings on character and personality made by the faculty counselors rate these students more favorably than the students with five or six over-under estimates.³¹ In interpreting the findings of Arsenian's study, Bowen scrutinized the method used to analyze the data. Bowen stated that the use of a self-rating scale resembling the normal curve did not allow for sufficient discrimination of ability. The properties of the normal curve show that near the mean a very small change in performance is sufficient to cause a large change in percentile rank. With Arsenian's group of subjects, a large number who obtained test scores near the mean would have to make an extremely fine discrimination and successfully estimate that they were above or below the mean in order for a high contingency coefficient to be obtained. In addition, Bowen indicated that students were asked to compare themselves with entering college freshmen nationwide which may have been rather nebulous for the subjects. In considering Arsenian's analysis, Bowen stated that the conclusion that college freshmen cannot accurately estimate their abilities may be incorrect.³²

Torrance conducted a study modeled after Arsenian's.

³¹Seth Arsenian, "Own Estimate and Objective Measurement," Journal of Educational Psychology 33(1942): 291-302.

³²Bowen.

Torrance discussed the use of self-estimates in terms of self-concept theory and their significance in the learning and adjustment of college freshmen. The results were utilized for counseling and guidance purposes throughout the freshman year. The point-of-view of Torrance was that the locus of evaluation must be kept within the individual, and that this principle need not be violated in using test results. Self-estimates were obtained for 1,215 entering freshmen at Kansas State College at the beginning of the freshman orientation program. The students were asked to give estimates of how they would stand in relation to their classmates on tests of general scholastic ability and achievement (as measured by the American Council of Education Psychological Examination, Cooperative English Achievement Test, and Cooperative Reading Test). At the end of the orientation program they were asked to give re-estimates. Torrance stated that his findings in relation to the accuracy and nature of self-evaluations confirmed those of Arsenian. Torrance found that more accurate evaluations were made by women than by men, but women under-evaluated themselves more frequently. He also wrote that the social situation at the beginning of college is likely to encourage optimism and that there has been little opportunity to develop relevant psycho-social judgmental scales on which the student can compare himself with the reference group. In conclusion, Torrance stated the importance of securing self-evaluations:

Securing self-evaluations from entering college freshmen is a quick, inexpensive procedure, and could well become a part of a college program of evaluating entering freshmen. Its correlates of adjustment and the insight it gives of the individual's own perception of himself add much to the meaning of the results of freshman test batteries. The device for recording self-estimates places the notion of the self-concept in sufficiently concrete terms to be meaningful to faculty advisers.³³

Berdie found that college freshmen's self-estimates and obtained measures on the American Council of Education Psychological Examination correlated more highly than Arsenian's or Torrance's groups. A correlation of .50 and .52 was obtained for experimental and control groups divided for the purpose of evaluating the effects of counseling. He found that college students could estimate more accurately their vocational interests and predict more accurately their achievement after counseling than before.³⁴ Bowen examined the relationship between self-estimates of academic ability and academic performance on a sample of 389 high school students. He found that self-estimates of the ability to do school work correlated .64 with high school grade point average.³⁵

Artley, Burton, and Cook investigated the perceived with the actual reading ability of a group of freshman college students. A total of 142 University of Missouri freshman

³³E. Paul Torrance, "Some Practical Uses of a Knowledge of Self-Concepts in Counseling and Guidance," Educational and Psychological Measurement 14(1954): 127.

³⁴Ralph F. Berdie, "Changes in Self-Ratings as a Method of Evaluating Counseling," Journal of Counseling Psychology 1(1954): 49-54.

³⁵Bowen.

education majors was asked to rate their perceived reading skill on a five-point scale (low, below-average, average, above-average, high) on three dimensions--comprehension, vocabulary, and rate. The study was to investigate how students who perceive themselves in those categories actually do on a standardized reading test (as measured by the Cooperative Reading Test) for each of the dimensions of reading. The authors were also interested in the level of achievement for those who rated their reading skills significantly below or above their measured skills. Criterion measures were the scores from the School and College Ability Test (SCAT), high school rank (HSR), first semester grade point average (1st GPA), second semester grade point average (2nd GPA), and cumulative freshman grade point average (CGPA). Correlations were computed between the groups' reading abilities and selected measures of their academic aptitude and achievement. Statistical analysis involved finding the mean and standard deviations for each category of perceived reading level for each of the three dimensions of reading skill measured. Table 6 provides the results which indicate a progressive rise in mean scores for all three areas. Thus, those who perceived their comprehension, vocabulary, or rate as above-average, for example, had a mean score significantly higher than that earned by those who perceived their skills as average. Identification of those students whose perception of their reading skills deviated from

TABLE 6.--Measured Means and Perceived Categories for Three Reading Skill Areas

Reading Skill	Perceived Reading Skill Categories			
	Low-Below Average	Average	Above Average	High
Comprehension	35.73 (n=11)	39.32 (n=71)	44.41 (n=54)	50.33 (n=6)
Vocabulary	21.42 (n=12)	21.67 (n=89)	22.81 (n=32)	25.22 (n=9)
Rate	10.54 (n=13)	12.15 (n=94)	17.16 (n=28)	20.57 (n=7)

the group mean of the category was indicated by a magnitude which exceeded the mean test score of the adjacent level. Low perceivers were those who perceived their reading skill as being at least one category below the level indicated by the reading test (for example, perceived skill as "average" but scored above the mean of the "above average" category). High perceivers were those at least one level above the measured skill. The high and low perceivers for each of the three reading skill areas were compared by analyzing mean differences on each of the measures of ability and academic performance. Tables 7, 8, and 9 display these comparisons. Pearson Product Moment correlations obtained for each combination of variables is shown in table 10. Results of the high and low perceiver indicated that students who underestimated their reading ability were more inclined to achieve higher on a measure of scholastic potential and had a higher grade

TABLE 7.--Comparison of Mean Scores on Reading Comprehension, Aptitude, and Achievement Measures between High and Low Perceivers

	Reading Compre- hension	S C A T			HSR	1st	2nd	Cum	
		V	Q	T		GPA	GPA	GPA	
High Per- ceivers n=36									
	\bar{x}	32.78	28.87	28.59	57.46	68.95	1.96	2.29	2.18
	SD	3.63	5.33	9.78	11.24	18.76	0.58	0.77	0.56
Low Per- ceivers n=34									
	\bar{x}	47.94	43.63	38.75	80.08	83.79	2.77	2.92	2.85
	SD	4.29	7.28	6.32	16.36	11.66	0.68	0.52	0.55
Mean Dif- ference		15.16	14.16	10.16	22.62	14.84	.81	.63	.67
t Value		16.09*	9.37*	5.38*	6.81*	3.99*	5.41*	3.98*	5.51*

*Significant at .01 level.

TABLE 8.--Comparison of Mean Scores on Vocabulary, Aptitude and Achievement Measures between High and Low Perceivers

		S C A T				HSR	1st GPA	2nd GPA	Cum GPA
	Vocab- ulary	V	Q	T					
High Per- ceivers									
n=52	\bar{x}	17.76	30.87	30.93	61.80	70.10	2.04	2.42	2.23
	SD	3.96	6.63	8.56	12.29	17.67	0.63	0.81	0.64
Low Per- ceivers									
n=65	\bar{x}	25.83	41.45	36.55	78.00	81.28	2.69	2.87	2.78
	SD	1.95	7.05	9.08	13.90	15.71	0.72	0.57	0.60
Mean Dif- ference		8.07	10.58	5.62	16.20	11.18	.65	.45	.55
t Value		13.90*	8.15*	3.36*	6.51*	3.55*	5.05*	3.40*	4.73*

*Significant at .01 level.

TABLE 9.--Comparison of Mean Scores on Reading Rate, Aptitude and Achievement Measures between High and Low Perceivers

		Read- ing Rate	S C A T			HSR	1st GPA	2nd GPA	Cum GPA
			V	Q	T				
<hr/>									
High Per- ceivers									
n=60	\bar{x}	7.36	33.05	31.23	64.30	72.44	2.15	2.47	2.31
	SD	2.59	7.71	9.54	14.27	18.91	0.68	0.78	0.64
<hr/>									
Low Per- ceivers									
n=32	\bar{x}	21.60	43.73	39.38	83.11	83.19	2.75	2.89	2.84
	SD	4.41	7.02	6.63	11.27	13.35	0.75	0.66	0.66
<hr/>									
Mean Dif- ference		14.24	10.68	8.15	18.81	10.75	.60	.42	.53
<hr/>									
t Value		19.94*	6.81*	4.52*	6.76*	3.00*	4.04*	2.70**	3.85*

*Significant at .01 level.

****Significant at .05 level.**

TABLE 10.--Pearsonian Correlations Relating Cooperative Reading Scores with Selected Criterion Measures

[illegible]

point average. Artley, Burton, and Cook indicated that this phenomenon may be due to the fact that low scoring subjects can err only in the "high" direction in their perceptions while high scoring individuals can err only in the "low" direction, with those scoring around the average to err in either direction. Results of the correlation showed that for this group of perceivers, the single most important reading skill related to success in the first year of college was comprehension.³⁶

The accuracy of estimation has been related to a variety of characteristics, but of particular interest in this study is the role of extroversion-introversion in self-estimations. Research by Eysenck on neurotic groups give support to the hypothesis that introverts have more insight about themselves in general than extroverts.³⁷ Vingoe investigated this hypothesis for normals. Subjects rated themselves on a seven-point extroversion-introversion scale and were divided into extroverts (those whose self-ratings were four and above) and introverts (those whose self-ratings were three and below). He also dichotomized the Eysenck Personality Inventory scores into extroverts (those who obtained an E score at or above the median) and introverts

³⁶A. Sterl Artley, R.L. Burton, and Dawn Cook, "Perceived Versus Measured Reading Skills," Journal of Reading 16(1973): 318-323.

³⁷H.J. Eysenck, "Classification and Problems of Diagnosis," in Handbook of Abnormal Psychology, ed. H.J. Eysenck (New York: Basic Books, 1961), pp. 1-31.

(those who obtained an E score below the median). The results indicated that introverts were more aware of their position on the extroversion-introversion continuum than are extroverts.³⁸ This study was replicated and the results confirmed.³⁹ The personality characteristics of good and poor judges of others was explored by Vingoe and Antonoff. Subjects took the Eysenck Personality Inventory and the California Personality Inventory and rated themselves and their peers on the variable of extroversion-introversion and the five variables from the California Personality Inventory (Dominance, Sociability, Self-acceptance, Responsibility, and Psychological-mindedness). Good raters were differentiated from poor raters on the basis of the discrepancy between the peer rating on each variable and the rating derived from the ratee's actual test score. Results of the eleven best judges compared to the ten poorest judges indicated that good judges minimize their worries and complaints, are well-adjusted, introverted, self-controlled, and tolerant.⁴⁰ Extroverts, as indicated by Eysenck, have lower task endurance

³⁸Frank J. Vingoe, "Validity of the Eysenck Extraversion Scale as Determined by Self-Ratings in Normals," British Journal of Social and Clinical Psychology 22(1966): 89-91.

³⁹Frank J. Vingoe, "Validity of the Eysenck Extraversion Scale: Replication and Extension," Psychological Reports 22(1968): 706-708.

⁴⁰Frank J. Vingoe and Steven R. Antonoff, "Personality Characteristics of Good Judges of Others," Journal of Counseling Psychology 15(1968): 91-93.

than introverts.⁴¹ Farley investigated to what extent extroverts described themselves as lacking in persistence and endurance. The need Endurance subscale of the Edwards Personal Preference Schedule was administered to sixty-six male trade apprentices. A high score on this scale indicated a self-rating of high endurance. The Eysenck Personality Inventory was administered to determine the degree of extroversion. A product moment correlation coefficient of -0.311 was significant beyond the five per cent point. The findings indicated that extroverts tended to rate themselves low in endurance. Farley indicated that the implications of this characteristic of extroverted-introverted behavior could be useful in such areas as industrial job performance and school achievement.⁴²

A substantial amount of research has been conducted relating the extroversion-introversion dimension of personality to learning theory and behavior. Lynn and Gordon have reviewed areas in which extroverts differ from introverts. They concluded that there are at least four major characteristics in which introverts differed from extroverts in a way which would be expected to have an effect on educational achievement. These four are (a) learning speed, with

⁴¹H.J. Eysenck, The Dynamics of Anxiety and Hysteria (London: Routledge and Kegan Paul, 1957).

⁴²Frank Farley, "Extraversion and the Self-Description of Endurance," British Journal of Social and Clinical Psychology 7(1968): 1-2.

introverts appearing to form conditioned responses more quickly than extroverts, (b) intelligence, with neurotic introverts tending to be more intelligent than neurotic extroverts, (c) work decrement, with introverts being superior to extroverts in tasks requiring sustained work or attention, and (d) accuracy and speed, with introverts undertaking tasks slowly and accurately while extroverts are quick and inaccurate.⁴³ Much of the following research has been summarized by Eysenck in several publications and presented in a research article by Rankin.⁴⁴ Several terms will be introduced, defined, and supported with research studies relevant to the field of reading.

Reminiscence. "Reminiscence" refers to an improvement in performance after a rest period. Under massed practice conditions, in theoretical terms, inhibition should be generated during practice periods and should dissipate during rest periods. This should produce a decline in performance during practice as well as an improvement in performance after rest. This increase in performance after rest may be taken as a measure of the amount of inhibition generated

⁴³R. Lynn and I.E. Gordon, "The Relation of Neuroticism and Extroversion to Intelligence and Educational Attainment," British Journal of Educational Psychology 3(1961): 194-203.

⁴⁴Earl F. Rankin, Jr., "Reading Test Performance of Introverts and Extroverts," New Developments in Progress and Procedure for College-Adult Reading, in Twelfth National Reading Conference Yearbook (Milwaukee: National Reading Conference, 1963), pp. 158-166.

during practice. Both Eysenck and Treadwell have supported the hypothesis that extroverts generate inhibition more quickly than introverts, and thus may be expected to display greater reminiscence effects.⁴⁵ To Rankin, this outcome may indicate a slight tendency for individuals who generate inhibition quickly (i.e., extroverts) to be either poorer readers or poorer test performers (or both) than individuals who generate inhibition slowly (i.e., introverts). In an early study, Anderson found that highly effective readers were frequently introverted as measured by the Cattell 16 PF Questionnaire. Two-hundred-ninety male and 125 female freshmen students in art, social sciences, pure sciences, engineering and applied sciences were given the 16 PF and Cooperative Reading Test. Correlations on the extroversion-introversion dimension and reading test were as follows: vocabulary (.25) and total (.17), both significant at the .1 percent level; rate (.16) and comprehension (.14), both significant at the one percent level. Anderson concluded that the general personality description of the good reader, as measured by the tests, included introversion, emotional sensitivity, self-sufficiency, and to a lesser extent, radicalism and low super-ego strength.⁴⁶ Rankin

⁴⁵H.J. Eysenck, "Reminiscence, Drive, and Personality Theory," Journal of Abnormal and Social Psychology 53(1956): 328-333; G. Treadwell, "Motor Reminiscence and Individual Personality Differences" (B.A. thesis, University of Belfast, 1956).

⁴⁶A.W. Anderson, "Personality Traits in Reading Ability of Western Australian University Freshmen," Journal of Educational Research 54(1961): 234-237.

found that reading test performance was significantly higher for introverts than for extroverts on the Cooperative English Test, Reading Comprehension.⁴⁷ In addition, Antoine found there was a significant correlation between extroversion and reading achievement and concluded that extroverts are less proficient readers than introverts.⁴⁸

Conditioning. Theoretically, it can be predicted that individuals in whom excitation is developed quickly and in whom inhibition develops slowly and dissipates rapidly (i.e., introverts) should condition rapidly and display slow extinction of responses. Individuals in whom excitation develops slowly and in whom inhibition develops rapidly and dissipates slowly (i.e., extroverts) should condition slowly and display rapid extinction of responses. Franks confirmed this prediction.⁴⁹ Himmelweit obtained some evidence that children who condition easily develop into better readers.⁵⁰ Whitehill and Jipson investigated whether extroverts and introverts will respond differently to an operant reading

⁴⁷Rankin, pp. 158-166.

⁴⁸Lloryel William Antoine, "Personality Types as a Predictor of Reading Achievement in Community College Students (Ed.D. dissertation, Northern Illinois University, 1972).

⁴⁹C.M. Franks, "Conditioning and Personality," Journal of Abnormal and Social Psychology 52(1956): 143-150.

⁵⁰H.T. Himmelweit, "The Intelligence-Vocabulary Ratio as a Measure of Temperament," Journal of Personality 14(1945): 95-105.

training program in which primarily aversive reinforcement was used. They found that extroverts worked best in a highly structured attention-focusing condition whereas introverts did not need such structuring. Extroverts worked more successfully under blame or punishment conditions as such conditions refocused attention inward to the task to be performed, while reward or praise conditions tended to focus attention outward.⁵¹ Whitehill and Rubin, using the Eysenck Personality Inventory, found that extroverts in a class of forty developmental reading students, made greater gains in flexibility than did introverts.⁵²

Persistence and Vigilance. "Persistence" refers to the continuation of effort in the attainment of a goal. "Vigilance" is applied to the sustained attention required by tasks demanding responses to infrequent signals emitted over long periods of time. Both persistence and vigilance entail a repetition of responses over time which build up inhibition. Several investigations have confirmed that extroverts give up more readily than introverts in tasks requiring persistence and vigilance. On a Matrices Test, Foulds found extroverted neurotics did better at the beginning

⁵¹Richard R. Whitehill and James A. Jipson, "Differential Reading Program Performance of Extraverts and Introverts," The Journal of Experimental Education 38(1970): 93-96.

⁵²Richard P. Whitehill and Sue J. Rubin, "Effectiveness of Instrumental and Traditional Methods of College Reading Instruction," Journal of Experimental Education 39(1971): 85-87.

but worse toward the end of the test.⁵³ Eysenck compared introvert and extrovert test performance on a non-verbal intelligence test. Results showed that "extroverts show greater work decrement on an intelligence test by taking longer to obtain correct solutions toward the end of the test, as compared with introverts, and by giving up more easily toward the end."⁵⁴ In Rankin's summary, the importance of persistence and vigilance is considered in the influence of the ease of learning to read, the enjoyment one gets from reading, the ability to read over long periods of time, and accuracy and consistency on reading tests. Lynn obtained a significant correlation of .33 between performance on a vigilance task and reading achievement.⁵⁵ Millott found that extroverts averaged 1.04 hours more than introverts in number of hours worked at the Reading and Study Skills Center, although the difference was not statistically significant.⁵⁶ Rankin found that extroverts showed more work decrement than introverts as indicated by the number of errors

⁵³G.A. Foulds, "Temperamental Differences in Maze Performance. Part I. Characteristic Difference Among Psychoneurotics," British Journal of Psychology 42(1951): 143-150.

⁵⁴H.J. Eysenck, "Personality and Problem Solving," Psychological Reports 5(1959): 592.

⁵⁵R. Lynn, "Individual Differences in Introversion-Extroversion, Reactive Inhibition and Reading Attainment," Journal of Educational Psychology 51(1960): 318-321.

⁵⁶R.F. Millott, "Reading Performance as a Correlate of the Personality Type of College Freshmen (On-going doctoral dissertation, University of Florida, 1974).

made on portions of the Cooperative English Test, Reading Comprehension. Mean errors were computed for extroverts and introverts on the first third, middle third, and last third of the vocabulary and speed of comprehension portions of the reading test. These results are presented in tables 11 and 12. The initial portion of both sub-tests showed no

TABLE 11.--Mean Errors on Successive Portions of Vocabulary Subtest

Thirds	Introverts	Extroverts	Difference	p
First	4.61	5.98	1.37	> .05
Middle	6.80	8.98	2.18	< .05
Last	8.86	10.82	1.96	< .05

TABLE 12.--Mean Errors on Successive Portions of Speed of Comprehension Subtest

Thirds	Introverts	Extroverts	Difference	p
First	4.02	5.61	1.59	> .05
Middle	4.32	6.20	1.88	< .01
Last	3.70	5.68	1.98	< .01

significant difference in errors between introverts and extraverts. On the middle and last third of both subtests, the extroverts made significantly more errors than the introverts. He concluded that his findings were consistent with the theoretical expectation that extroverts will build

up reactive inhibition faster than introverts as they work their way through a reading test.⁵⁷

Impulsivity and Intro-individual Variability. These are very closely related behavioral characteristics. "Impulsivity" is characterized by a tendency to act on the spur of the moment without thinking. It can be expected that an impulsive individual will show more variable behavior over time in the same situation and his behavior will be less predictable. These are characteristics of extroverts. As Rankin stated:

Since repetition generates reactive inhibition more quickly in extroverts and therefore produces greater discomfort, they will, under conditions demanding repetition of response, attempt to reduce discomfort by making impulsive changes in behavior. On the other hand, the greater cortical excitation which characterizes introverts makes for a greater amount of cerebral activity which results in more planning of behavior and greater cortical control over impulses from lower brain centers, thus reducing impulsiveness and creating more consistency of behavior.

Since impulsiveness and intro-individual variability among extroverts should reveal itself in fluctuations in reading efficiency over time and, in consequence, lower test reliability and validity if the test in question generates sufficient reactive inhibition in the person taking the test.⁵⁸

Reading Test Reliability. Rankin, under the assumption that reading test reliability was a function of intro-individual variability, compared reliability coefficients for introverts and extroverts on a cloze test and on two

⁵⁷Rankin, pp. 158-166.

⁵⁸Ibid.

standardized reading tests. On all three tests, he found the extrovert reliability coefficient to be significantly lower than the introvert coefficient (.26 and .59, respectively). Rankin concluded that the greater the degree of extroversion, the smaller the reliability and validity.⁵⁹

Research on the success and failure of university students has drawn attention to the important part played by the extroversion-introversion dimension of personality. Furneaux investigated the relationship between extroversion and neuroticism and failure rate on examinations by students in various branches of engineering. Examination failure rate varied greatly, with the neurotic introvert group showing the lowest failure rate (21 percent), and the stable extrovert group showing the highest failure rate (60 percent).⁶⁰ Bendig found that introverted university students tended to do well academically.⁶¹ Entwistle and Entwistle investigated the relationship between personality, study methods, and academic performance. One-hundred-thirty-nine university

⁵⁹Earl F. Rankin, Jr., "Reading Test Reliability and Validity as a Function of Introversion-Extroversion," Journal of Developmental Reading 6(1963): 106-117.

⁶⁰W.D. Furneaux, Universities and Students: The Value of Psychological Research in a Specialized Context (Report to the Imperial College of Science and Technology, University of London, 1957).

⁶¹A.W. Bendig, "Extraversion, Neuroticism, and Student Achievement in Introductory Psychology," Journal of Educational Research 53(1960): 263-267.

students and 118 students at a college of education were given the Eysenck Personality Inventory and a questionnaire relating to academic motivation and study methods. A correlation analysis of these scores in relation to academic performance resulted in the successful student as having below-average scores on extroversion, together with high scores on the study methods and motivation scales. There was a clear link between good study methods for both introversion and stability.⁶²

Summary

Chapter II presented a summary of the theory and research in the areas of self-estimation and extroversion-introversion. Specifically noted was the relationship between the self-estimation abilities of extroverts and introverts. Characteristics of the extrovert and introvert which are expected to have an effect on educational achievement, and in particular on reading abilities, are reminiscence, conditioning, and work decrement. In the research presented, it was emphasized that knowledge of this dimension of personality as well as that of the self-estimations, is valuable in academic and counseling environments.

⁶²N.J. Entwistle and D. Entwistle, "The Relationship Between Personality, Study Methods and Academic Performance," British Journal of Educational Psychology 40(1970): 132-141.

CHAPTER III

PRESENTATION AND ANALYSIS OF DATA

This study was conducted to determine whether significant differences existed between the E scores of college engineering students on three levels of accuracy of estimation for each of three reading skills: comprehension, rate, and vocabulary. Sixty-nine engineering students participated in the study. The students were instructed to complete a Self Estimate Form of Reading Skills and the Eysenck Personality Inventory. This was followed by instructions for the Nelson Denny Reading Test, Form C. From the results of the self-estimate form and the standardized reading test, the students were classified as either accurate estimators, overestimators, or underestimators in each of three reading skills. A one-way ANOVA was used in analyzing the E scale raw score means for each reading skill. A confidence level was set a priori at the .05 level. The following data represents the results of the descriptive information, correlational analysis, and the ANOVA summary.

General Information Data and Analysis

Means and standard deviations were calculated on the entire sample for twelve variables (see table 13). The engineering students had a mean percentile of 74.42 on estimation of comprehension skills with a range from thirty to ninety-five. For the estimation percentile of rate, there was a range of twenty-five to ninety-five and a mean of 68.41. The percentile range for the estimated performance on vocabulary was forty to one-hundred with a mean of 74.35. Means of the estimated and measured performance percentiles for each reading skill were between the fiftieth and seventy-fifth percentiles. The mean E score of 9.62 is toward the introverted end of the continuum, with a mean of 13.1 reported in the test manual for American college students. There was little dispersion of scores for GPA with a standard deviation of .61 and a mean of 2.76. Population size of home town averaged 16,500 people.

The means and standard deviations were calculated on each estimator level for reading comprehension (see table 14). The accurate estimating engineering student had a mean percentile of seventy-seven for estimated performance and seventy-five for measured performance, a difference of two percentile points. These two percentile categories, plus the measured score, E score, and GPA means were second highest compared to the other two levels of estimation. Accurate estimators came from the smallest towns. The

TABLE 13.--Means and Standard Deviations of Entire Sample (n=69)

	Mean	S.D.
Comprehension:		
Estimated performance %ile	74.42	13.97
Measured performance %ile	69.75	22.13
Measured score (Total possible: 72)	54.62	7.75
Rate:		
Estimated performance %ile	68.41	15.86
Measured performance %ile	51.68	29.01
Measured score (Total possible: 636 wpm)	287.71	93.21
Vocabulary:		
Estimated performance %ile	74.35	14.75
Measured performance %ile	70.97	21.76
Measured score (Total possible: 100)	59.33	14.52
E Score (Total possible: 24)	9.62	4.16
Cumulative grade-point average (4.0 scale)	2.76	.61
Population of home town (x100)	16.50	17.83

TABLE 14.--Means and Standard Deviations on Each Estimator Level for Reading Comprehension

	Esti- mated %ile	Mea- sured %ile	Mea- sured Score	E Score	GPA	Pop.
Accurate Estimator						
Mean	77.22	75.19	56.47	9.69	2.78	13.25
S.D.	12.95	18.08	6.91	4.50	.70	14.75
n=36						
Overestimator						
Mean	78.82	42.88	46.35	10.76	2.60	17.02
S.D.	11.40	12.27	4.96	3.23	.04	17.83
n=17						
Underestimator						
Mean	63.44	86.06	59.25	8.25	2.86	23.30
S.D.	13.63	11.07	5.11	4.07	.54	22.79
n=16						

overestimator, who had the highest estimated percentile of all three levels, had a difference of thirty-six points between estimated and measured performance percentiles. The overestimator had the lowest mean for measured score and GPA, the highest E score, and placed second highest in the population size of home town. Underestimators had the lowest estimation percentile mean, but had the highest measured performance percentile mean. There was a difference of twenty-six points between the estimated and measured percentiles. These students scored lowest on the E score (or tended to be the most introverted), had the highest GPA, and came from the largest towns.

The descriptive information of means and standard deviations for rate was calculated on each estimator level (see table 15). The accurate estimating engineering student ranked in the seventieth percentile for estimated percentile and seventy-second in measured performance. This is a difference of two percentile points. For the accurate estimator, the estimated percentile mean was the highest for all three levels of estimation. The means of measured percentile, measured score, E score, GPA, and population size of home town ranked second highest. The overestimator had a difference of thirty-nine percentile points between the estimated and measured percentiles. The overestimator ranked second highest in estimated percentile means and highest for E score, GPA, and population size of home town.

TABLE 15.--Means and Standard Deviations on Each Estimator Level for Reading Rate

	Esti- mated %ile	Mea- sured %ile	Mea- sured Score	E Score	GPA	Pop.
Accurate Estimator						
Mean	70.62	72.17	350.62	9.42	2.68	14.16
S.D.	18.78	21.88	96.30	4.01	.61	16.52
n=24						
Overestimator						
Mean	69.29	30.69	226.65	9.97	2.89	18.58
S.D.	13.62	18.20	44.70	4.39	.64	19.39
n=35						
Underestimator						
Mean	60.00	76.00	354.00	8.90	2.50	14.90
S.D.	14.34	19.83	62.33	3.96	.39	15.81
n=10						

Overestimators had the lowest measured percentile and measured score means. The underestimator had a difference of sixteen points between the means of estimated and measured performance percentiles. The students had the lowest mean on each estimation level for estimation of rate, E score, and GPA. They placed second highest on home town size and highest on measured performance percentile and measured score.

Reading vocabulary means and standard deviations were calculated on each estimator level (see table 16). Accurate estimators had the highest estimated percentiles on all three estimation levels, and the second highest measured performance percentile and measured score. There was a difference of two points between the estimated and measured performance percentile means. The means of the E score and GPA were second highest, and the accurate estimator came from the largest towns. The overestimator had a difference of twenty-six percentile points between the estimated and measured percentiles. The mean of the estimated percentiles was second highest of all three levels. For the overestimator, the measured percentiles, measured score, GPA, and home town size means were the lowest and the E score was the highest. Underestimators had a difference of twenty-eight percentile points between estimated and measured percentiles. They had the lowest mean for each level on estimated percentile and E score,

TABLE 16.--Means and Standard Deviations on Each Estimator
Level for Reading Vocabulary

	Esti- mated %ile	Mea- sured %ile	Mea- sured Score	E Score	GPA	Pop.
Accurate Estimator						
Mean	78.42	80.21	65.18	9.71	2.81	17.76
S.D.	13.61	13.07	11.03	4.24	.58	19.79
n=38						
Overestimator						
Mean	72.86	45.14	43.76	10.81	2.59	14.19
S.D.	14.88	14.79	7.34	3.94	.69	14.91
n=21						
Underestimator						
Mean	62.00	90.10	69.80	6.80	2.96	16.62
S.D.	12.06	8.12	11.89	3.16	.48	16.72
n=10						

second highest on population size of home town, and highest for measured percentile, measured score, and GPA.

The GPA was tested by an ANOVA technique to determine if there were significant differences between the grades on each level for each reading skill (see table 17). The ANOVA revealed no significant differences at the .05 level. The calculated F value for reading comprehension was significant at the .25 level.

An ANOVA technique was also used to test differences in population size of home town for each measured reading skill (see table 18). The results yielded no significant differences at the .05 level. The F value for comprehension was significant at the .25 level.

Correlation coefficients for each estimator level were computed for comprehension (see table 19). There was a substantial relationship (correlation between .40 and .70) between the estimated to measured percentile for the accurate estimators. There was a definite but small relationship (correlation between .20 and .40) between measured percentile to E score. For overestimators there was a substantial relationship between the estimated to measured percentile and estimated percentile to E score. A very dependable relationship (correlation between .90 and 1.00) existed between the estimated to measured percentile for the underestimators. The coefficients reported for the underestimator on estimated percentile to E score and measured percentile

TABLE 17.--ANOVA Summary Table on GPA for Three Reading Skills

Source	SS	df	MS	F
Reading Comprehension				
Between	1.63	2	.82	1.73
Within	30.59	65	.47	
Total	32.22	67		
Reading Rate				
Between	.73	2	.37	.76
Within	31.21	65	.48	
Total	31.94	67		
Reading Vocabulary				
Between	.95	2	.48	.99
Within	31.10	65	.48	
Total	32.05	67		

TABLE 18.--ANOVA Summary Table on Population of Home Town for Three Reading Skills

Source	SS	df	MS	F
Reading Comprehension				
Between	112407.38	2	56203.69	1.81
Within	2049394.00	66	31051.42	
Total	2161801.38	68		
Reading Rate				
Between	30836.80	2	15418.40	.48
Within	2130959.00	66	32287.25	
Total	2161795.80	68		
Reading Vocabulary				
Between	17182.19	2	8591.09	.26
Within	2144611.00	66	32494.12	
Total	2161793.19	68		

to E score showed a definite but small relationship. All other correlations were small and showed little relationship.

The correlation coefficients on each estimator level for rate were computed (see table 20). A very dependable relationship between estimated to measured percentile, a definite but small relationship between estimated percentile to E score, and a substantial relationship between measured percentile and E score were shown for the accurate estimator. For the overestimator the coefficients showed a definite but small relationship between the estimated to measured percentile and very small relationships on the other two comparisons. The coefficients for the underestimator showed definite but small relationships only for estimated percentile to E score and measured percentile to E score.

Correlation coefficients were calculated on each estimation level for vocabulary (see table 21). In this skill, coefficients for all three estimator levels showed marked relationships between the estimated to measured percentiles. The coefficients for overestimators and underestimators showed definite but small relationships between the estimated percentile to E score and measured percentile to E score. All other coefficients were low.

TABLE 19.--Correlation Coefficients on Each Estimation Level for Comprehension

	Estimated %ile to Measured %ile	Estimated %ile to E Score	Measured %ile to E Score
Accurate Estimator n=36	.68	.11	-.22
Overestimator n=17	.45	-.27	.12
Underestimator n=16	.92	.34	.32

TABLE 20.--Correlation Coefficients on Each Estimation Level for Rate

	Estimated %ile to Measured %ile	Estimated %ile to E Score	Measured %ile to E Score
Accurate Estimator n=24	.94	.36	.47
Overestimator n=35	.38	-.06	.04
Underestimator n=10	.15	.43	.24

TABLE 21.--Correlation Coefficients on Each Estimation Level for Vocabulary

	Estimated %ile to Measured %ile	Estimated %ile to E Score	Measured %ile to E Score
Accurate Estimator n=38	.82	.03	-.02
Overestimator n=21	.79	-.34	-.22
Underestimator n=10	.71	.20	.41

ANOVA Data and Analysis

To accomplish the purpose of this study, three null hypotheses were established to be tested. Hypothesis 1 stated that there are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading comprehension. The ANOVA summary presented in table 22 revealed no significant differences between the E scores at the .05 level of significance. The null hypothesis was accepted.

TABLE 22.--ANOVA Summary Table on E Score for Reading Comprehension

Source	SS	df	MS	F
Between	52.51	2	26.25	1.54
Within	1123.69	66	17.03	
Total	1176.20	68		

Hypothesis 2 stated that there are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading rate. The results of the ANOVA revealed no significant differences in the E scores. The null hypothesis was accepted (see table 23).

TABLE 23.--ANOVA Summary Table on E Score for Reading Rate

Source	SS	df	MS	F
Between	10.50	2	5.25	.30
Within	1165.70	66	17.66	
Total	1176.20	68		

Hypothesis 3 stated that there are no significant differences between raw score means on the E scale for three levels of accuracy of estimation on reading vocabulary. The ANOVA revealed a significant difference between means at the .05 level of significance. The null hypothesis was rejected. Results are presented in table 24.

TABLE 24.--ANOVA Summary Table on E Score for Reading Vocabulary

Source	SS	df	MS	F
Between	109.55	2	54.77	3.39*
Within	1066.65	66	16.16	
Total	1176.20	68		

*Significant at the .05 level.

In order to determine how the three estimator level's E scores differed, Tukey's Honestly Significant Difference's (HSD) test with unequal sizes was used. The results are summarized in table 25. An examination of the means indicated that the E score mean for overestimators

in vocabulary was significantly higher at the .05 level than that of the underestimator. No other differences were found significant.

TABLE 25.--Tukey's HSD Test of E Score Means for Reading Vocabulary

	Under- Estimator	Accurate Estimator	Over- Estimator
Underestimator $\bar{X}=6.8$	--	2.9	4.0*
Accurate Estimator $\bar{X}=9.7$		--	1.1
Overestimator $\bar{X}=10.8$			--

*Significant at the .05 level.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine if engineering students' accuracy of self-estimation of three reading skills was a function of the extroversion-introversion dimension of personality. Sixty-nine University of Oklahoma engineering students enrolled in core courses during the 1975 summer term were classified as either accurate estimators, overestimators, or underestimators for each of three reading skills. These groups were classified from the results of the Self-Estimate Form of Reading Skills and the Nelson-Denny Reading Test. Each student was also administered the Eysenck Personality Inventory for an extroversion-introversion scale score. Additional descriptive information was secured from the Office of Admissions and Records including grade point average, birthdate, size of hometown, college, and major.

The primary comparisons dealt with the differences between extroversion-introversion scores for each estimator group in each skill of reading comprehension, reading rate, and reading vocabulary. Results of the analysis indicated

that for the two reading skills of comprehension and rate, there were no differences between the extroversion-introversion scores. There were differences shown in the vocabulary skill. The overestimator's score was higher than the underestimator's extroversion-introversion score, but not higher than the accurate estimator's score. In summary of the problem under investigation, it appeared that there were differences in the extroversion-introversion scores for the three levels of estimation on the vocabulary skill, but not for comprehension or rate.

Conclusions

The following are conclusions from the study:

1. For the reading skill of comprehension, there was no difference in the degree of extroversion-introversion for engineering students who are grouped as either accurate estimators, overestimators, or underestimators.
2. For the reading skill of rate, there was no difference in the degree of extroversion-introversion for engineering students who were either accurate estimators, overestimators, or underestimators.
3. For the reading skill of vocabulary, the overestimating engineering students were more extroverted than were the underestimators.
4. Engineering students were more introverted than the average population of American college students.

5. Engineering students showed a greater degree of proficiency in reading skills than the average population of American college students.

6. On all three reading skills, underestimating engineering students were more introverted than the other estimator levels. Also, the underestimating engineering students had the greatest proficiency in reading skills.

7. The factors of age, population size of home town, years since high school graduation, grade point hours, and cumulative grade point average showed no effect upon the degree of extroversion-introversion.

8. There was a very dependable relationship in the amount engineering students underestimated reading comprehension abilities.

9. There is a very dependable relationship in the amount engineering students accurately estimated reading rates.

10. There is a marked relationship in the amount engineering students estimated abilities in reading vocabulary.

Recommendations for Further Study

The following are recommendations for additional research.

1. Replication of the study during the fall or spring semester core courses in the College of Engineering could provide a broader base for conclusions.

2. Additional studies should be replicated using other academic disciplines with a male-female population.

3. A similar study should be conducted in which extroversion-introversion and reading performance of lower division students and upper division college students are compared.

3. Studies should be conducted to determine whether certain reading skills are more difficult to accurately estimate than other reading skills.

APPENDIX A

THREE FORMS OF SELF-ESTIMATE FORM OF READING SKILLS

APPENDIX A

SELF-ESTIMATE FORM OF READING SKILLS

Student ID# _____ Male _____ Female _____

Grade: Freshman____ Sophomore____ Junior____ Senior____

DIRECTIONS:

Compare yourself to other students at this university in the three reading skills listed below. Mark the percent in the blank for each skill.

Reading Comprehension:	I do as well as _____ percent of the students.
Reading Rate:	I do as well as _____ percent of the students.
Reading Vocabulary:	I do as well as _____ percent of the students

Form A

SELF-ESTIMATE FORM OF READING SKILLS

Student ID# _____ Male _____ Female _____

Grade: Freshman____ Sophomore____ Junior____ Senior____

DIRECTIONS:

Compare yourself to other students at this university in the three reading skills listed below. Mark the percent in the blank for each skill.

Reading Rate:	I do as well as _____ percent of the students.
Reading Vocabulary:	I do as well as _____ percent of the students.
Reading Comprehension:	I do as well as _____ percent of the students.

Form B

SELF-ESTIMATE FORM OF READING SKILLS

Student ID# _____ Male _____ Female _____

Grade: Freshman _____ Sophomore _____ Junior _____ Senior _____

DIRECTIONS:

Compare yourself to other students at this university in the three reading skills listed below. Mark the percent in the blank for each skill.

Reading Vocabulary:	I do as well as _____ percent of the students.
Reading Comprehension:	I do as well as _____ percent of the students.
Reading Rate:	I do as well as _____ percent of the students.

Form C

APPENDIX B

INITIAL FORM OF SELF-ESTIMATE FORM OF READING SKILLS

APPENDIX B

SELF-ESTIMATE FORM OF READING SKILLS

Student ID# _____ Male _____ Female _____

DIRECTIONS:

Compare yourself to other students in your field at this university in the three skills listed below. Place the appropriate number rating in the blanks.

RATING SCALE

I place myself in the:	<u>Number Rating</u>
75-100th percentile	4
50- 74th percentile	3
25- 49th percentile	2
0- 24th percentile	1

Mark the number rating for the three reading skills below:

Reading Comprehension	_____
Reading Rate	_____
Reading Vocabulary	_____

APPENDIX C

FIRST REVISION OF SELF-ESTIMATE FORM OF READING SKILLS

APPENDIX C

SELF-ESTIMATE FORM OF READING SKILLS

Student ID# _____ Male _____ Female _____

DIRECTIONS:

Compare yourself to other students in your field at this university in the three reading skills listed below. Place the appropriate percent in the blanks.

RATING SCALE

I do as well as the following percent of the students in each of the reading skills listed below:

100 percent of the students
90 percent of the students
80 percent of the students
70 percent of the students
60 percent of the students
50 percent of the students
40 percent of the students
30 percent of the students
20 percent of the students
10 percent of the students
0 percent of the students

Reading Comprehension _____ percent

Reading Rate _____ percent

Reading Vocabulary _____ percent

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