Predicting Licensing Examination Performance With Cognitive Style And Reactive Behavior Pattern Assessments

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PREDICTING LICENSING EXAMINATION PERFORMANCE WITH COGNITIVE STYLE AND REACTIVE BEHAVIOR PATTERN ASSESSMENTS

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Educational Research, Technology, and Leadership in the College of Education at the University of Central Florida Orlando, Florida

Spring Term
2004
ABSTRACT

Candidates for Florida real estate sales associate licensure responded to a two-part questionnaire based on William A. Long’s Reactive Behavior Patterns Theory and Robert J. Sternberg’s Triarchic Theory of Intelligence. Examination scores were converted to a dichotomous pass/fail variable based on the Florida Real Estate Commission-mandated cut-off score of 75 correctly answered questions out of 100. The candidates’ responses to the questionnaire comprising the Long-Dziuban Inventory and the Cognitive Strengths Task List based on Sternberg’s theory, were crosstabulated with pass/fail to identify differential passing proportions, if any, based on reactive behavior pattern and/or cognitive strength. An ANOVA procedure was used with the raw scores to determine whether statistically significant differences in mean exam scores existed between the four Long Types and the three Cognitive Types adapted from Sternberg’s theory. The data were subjected to similar analyses to ascertain whether the ancillary traits described by Long were predictive of exam performance. A crosstabulation of Long Type by Cognitive (Sternberg) Type was performed to find out if any significant relationships existed between the several dimensions of the Long-Dziuban Inventory and the Cognitive Strengths Task List. The results revealed a moderate statistically significant relationship between exam performance and cognitive strength, with analytical types and creative types having the greatest exam success. Tenuous relationships were identified between exam performance and the Long types and traits and between the Long-based and the Sternberg-based components of the research instrument. Although the results of this study did not establish definitive relationships between the Long and Sternberg constructs, by combining them into a measure of cognitive style, it forged a framework for future research into the relationship between licensing examination performance and cognitive styles. Within this framework are the
components of a predictive model potentially useful for identifying not only real estate licensing
exam performance but also for identifying persons likely to succeed in the real estate industry
Because it represents the culmination of a long process through which my wife, Diana, made many sacrifices yet always encouraged and stood beside me, I dedicate this dissertation to her.
ACKNOWLEDGMENTS

Foremost, I want to thank my mentor and friend Dr. Chuck Dziuban for his help and guidance through the years. I also want to thank Dr. Patsy Moskal for her help in getting this project completed. I am grateful to Dr. Sternberg for the input he provided toward designing the research instrument and to his staff at Yale for generously supplying me with copies of the voluminous research underlying Dr. Sternberg’s Triarchic Theory. I also must thank my other committee members, Dr. Marcella Kysilka, Dr. Bill Weaver, and Dr. Cynthia Hutchinson, for hanging in there with me through this endeavor.
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CHAPTER 1: INTRODUCTION

Achievement tests judge not only how well students learn, but also measure the efficiency and effectiveness of their learning. Current research in education, psychology, and medicine suggests that a varied approach to teaching is more effective (Knowles, 1992) than the traditional lecture/listen format, especially with adult learners. From the theoretical position that people learn in different ways, the author used his experience with hundreds of examinees who have sat for the Florida Real Estate Licensing Examination to develop this study. Candidates identified their reactive behavior patterns (Long, 1985) and their dominant cognitive abilities from among three proposed dimensions in Sternberg’s Triarchic Theory of Intelligence (Sternberg, 1984).

The researcher collected data that identified reactive behavior patterns and cognitive strengths from self-reported responses to instrument items, and compared that data to the candidates’ examination performance, identifying which cognitive abilities and behavior patterns are associated with a passing or failing performance. The information collected can portray predominant cognitive abilities and personality attributes of the licensees regulated by the Department of Business and Professional Regulation/Division of Real Estate (DBPR/DRE). These data will also be useful to design and modify educational opportunities that better meet the needs of this population. The study also pilot tested the Cognitive Task Checklist and compared it with the Long-Dziuban Inventory, an instrument shown in previous research to elucidate differential levels of learning and achievement.

Traditional and web-based courses that are structured to complement the thinking and learning predispositions of the real estate licensee population should have a broad positive impact. The Department will have better-educated licensees who are less likely to commit
violations through ignorance or misunderstanding, reducing the number of disciplinary cases the Department must investigate and prosecute (Sirmans, 1994). A better-educated force of licensees will result in better service to the public.

Purpose

The purpose of this study was to determine the relationship between cognitive and personality attributes of prospective real estate licensees and their performance on the licensure examination required by the Florida Real Estate Commission. This will help to develop appropriate and effective educational assessment experiences for both licensees and practicing professionals. Learning style theories and multiple intelligence research, especially the work of Long (1985) and Sternberg (1984), were reviewed along with background information supporting the current research paradigm. This research supports the ongoing efforts to keep the Florida Real Estate Commission’s education and evaluation initiatives current and viable, having implications for the design and delivery of distance (web-based) education processes.

Research Questions

The specific research questions of this study were:

1. What relationship exists between Long’s reactive behavior patterns and the examination scores of candidates for real estate licensure in Florida?

2. What relationship exists between cognitive strengths based on Sternberg’s Triarchic Theory and the real estate licensure examination scoring patterns?

3. What relationship exists between Long’s reactive behavior patterns and Sternberg’s Triarchic Theory of differential performance on cognitive tasks?
Background

For nearly a century, a person’s Intelligent Quotient (IQ)—a single, numerical value—has been used to determine a person’s cognitive ability and to predict a person’s school performance; a determination that may result in a possible inflated or deflated idea of self-worth. Within this same 100-year span, however, educational and psychological research has indicated that IQ as a singular determining factor of a person’s ability or inability to succeed in life may be an over simplification. To provide perspective for the reader, the researcher presented an overview of the IQ literature (a conceptualization of general mental ability widely known as “g”) is explored. The theories of Long and Sternberg, that represent viable explanations for the variability in learning that is demonstrated by achievement test performance, are then discussed.

Sternberg’s Triarchic Theory (1977) provided the basis of this study. He speculated that the intelligent person assesses his strengths and weaknesses, capitalizing and compensating effectively. While Sternberg’s idea about the essence of the intelligent person is well expressed from a cognitive viewpoint, it is important to note that the cognitive and metacognitive abilities represent only limited dimensions of intelligent behavior.

Assumptions and Limitations

This study is predicated upon the assumption that respondents would truthfully and accurately complete the instruments given to them and assumed that the respondents understood of the questions. The lack of candor from the respondents could corrupt and confound the results of the study. Another critical assumption is that the research instrument actually measured the attributes that it was designed to assess.
Examination performance is assumed to vary systematically with cognitive attributes, and cognitive attributes are assumed to systematically relate to reactive behavior patterns that corresponded to the assumptions underlying Long’s theory of reactive behavior patterns and Sternberg’s Triarchic Theory of Intelligence. Generally, any theoretical paradigm that seeks to explain differences in academic achievement or performance—whether stated as a theory of intelligence, a personality theory, or a combination represented by learning styles theory—all strive to explain individual differences. Since both Long’s and Sternberg’s theories suggest the interrelatedness of theoretical positions, data from these research instruments might prove useful in demonstrating that covariance.

A comprehensive examination of behavioral mediators is beyond the scope of this research, but the researcher recognized that intellectual capacity, as measured by intelligence or achievement tests, is not the sole arbiter of behavior. It is likely that cognitive styles also contribute some explanation for how people apply their abilities.

Long’s Personality Classification

Long asserted that personality provides the variety in an individual’s reaction to a given set of circumstances, including the learning environment (Long, 1989). He classified personalities as aggressive (active) or passive combined with a temperament that is either independent or dependent, therefore, identifying four personality types: aggressive-independent and aggressive-dependent, passive-independent and passive-dependent. Long also described four ancillary traits that color the personality types: impulsive, obsessive-compulsive, hysterical, and phobic. Each person may possess one, some, or all of the traits. Although the descriptors of these
types and traits sound clinical, even pathological, Long (1985, 1989), stated that they are all within the range of “normal” behavior, and common to all.

The Long-Dziuban Inventory

Although the Long-Dziuban Inventory (Long & Dziuban, 1998) was not designed to identify learning styles per se, a number of studies have used the device to reliably predict differences in learning-related behavior (Cioffi & Kysilka, 1997; Weins & Dziuban, 1996), thus establishing the instrument as a valid assessment measure. Young and Dziuban (2000) use the Inventory to identify differences among college students who use university writing centers for assistance with writing-intensive assignments; the inventory served to clarify how students approach writing tasks.

Sternberg’s Triarchic Theory of Intelligence

Sternberg described three distinctive, yet interdependent types of intelligence—practical, analytical, and creative—establishing a framework conducive to the delineation of cognitive styles. Sternberg (1996) suggested that differences in intellectual style might explain differential achievement levels among persons of essentially equivalent ability.

Sternberg and Grigorenko (1997) wrote that cognitive styles are a person’s preferred mode of processing information. They described cognitive style as a subset of the general construct of style, identified by Guralnik (1976, p. 1415) as “a distinctive or characteristic manner or method of acting or performing.” The concept of cognitive styles is an attempt by psychologists to link personality and cognition; and this notion of cognitive styles links Long’s and Sternberg’s theories because the behavioral manifestations of cognition, intelligence, and
personality are inextricably intertwined—none operates apart from the influence of the other constructs.

The concern with cognitive style, therefore, was associated with the author’s focus on a theory of intelligence and a theory of reactive patterns that demonstrated the differential between high and low academic achievers in the classroom. The structure of the Cognitive Tasks Checklist, coupled with the Long-Dziuban Inventory represented the foundation of the cognitive style assessment presented in this study.

**Procedure**

The Long/Dziuban Inventory and the Thinking Skills-Task Performance Self-Rating Scale were used for this study. The questionnaires directed the respondents to choose among four of Long’s personality type descriptors and as many ancillary trait descriptors as they felt were applicable. The Thinking Skills-Task Performance Self-Relating Scale asks respondents to identify the set that most closely describes what they do best from three lists of descriptors pertaining to cognitive abilities as suggested in Sternberg’s Triarchic Theory. The researcher administered the questionnaires to real estate licensing exam candidates prior to their taking the Real Estate Licensing Examination. The questionnaires identified candidates by number and the researcher then matched the data collected with the exam scores.

**Data Analysis**

The data gathered through administration of the questionnaire were categorical; therefore, the examination scores were transformed to match into binary categories—pass-fail. The investigator analyzed the results using the SPSS Crosstabs procedure. This technique can
also be used to statistically test an independence hypothesis between variables. SPSS creates contingency tables consisting of rows and columns such that chi square comparisons between two or more table variables are possible (SPSS, 2003). For example, in the current study, row by column tables were created based on variables specified such that the table rows specify Long type and the columns specify passing or failing the exam. Since there were four Long types and only two possible categories for passing or failing, the software created a four by two table. The probability associated with the significance test gives the approximate chance of a type one error—falsely rejecting a true null hypothesis. On the other hand, a type two error is made by incorrectly failing to reject the null hypothesis. The probability of a type two error is determined by one minus the power of the test.

Alternatively, the same data were analyzed using the interval level measure of examination performance. The raw examination scores achieved by the various groupings established by the questionnaire were used to determine whether the average achievement of the several groups differed significantly. Analysis of variance is a statistical procedure for testing significant difference in mean scores between groups.

The goal in both the categorical approach (pass/fail) and the numeric approach (Score), was to ascertain whether the constructs “type” and “trait” from Long’s Reactive Behavior Patterns Theory or any of the three types of intelligence described in Sternberg’s Triarchic Theory are useful in predicting exam performance. In other words, is a person who describes himself or herself as an aggressive dependent more likely to pass the exam than a person describing himself or herself as an aggressive independent? In addition, the researcher investigated the relationship among the variables associated with the Long and Sternberg theories.
CHAPTER 2: REVIEW OF LITERATURE

The diversity of motivational, emotional, and maturation characteristics found in various personality types challenge educators to develop strategies to meet the needs of a diverse group of students. This dissertation presents a review of the literature that focuses on an historical overview of intelligence theory and measurement, along with an overview of learning styles. The literature review then narrows to encompass the paradigms of Sternberg’s Triarchic Theory of Intelligence in a conceptual comparison with Long’s Reactive Behavior Patterns theoretical model. Long’s work is not intended as a theory of intelligence, a learning styles theory, or a cognitive styles theory, yet encompasses, at least conceptually, each of these three theoretic approaches to differential human learning and performance.

Intelligence Theories

For nearly a century, American educators have accepted the premise that intelligence and school performance are reflected in or predicted by a singular numerical value: a person’s Intelligence Quotient (IQ) or “g.” Within this same 100 year span, however, there have been indications from the educational and psychological arenas that America’s near-obsession in viewing IQ as a primary predictor of a person’s potential for success is not valid.

The concept of “g” is based on the work of Binet, a French psychologist who endeavored to identify the cause for poor school performance, not limit or label students. Binet believed that some children might be innately incapable of normal achievement, but that all could improve with special help. He wrote (1905, p. 37) “Our purpose is to be able to measure the intellectual capacity of a child who is brought to us in order to know whether he is normal or retarded. We would therefore study his condition at that time and that time only. We have nothing to do with
his past history or with his future; consequently, we shall neglect his etiology, and we make no attempt to distinguish between acquired and congenital…As to that which concerns his future, we shall exercise the same abstinence; we do not attempt to establish or prepare a prognosis, and we leave unanswered the question of whether this retardation is curable or even improvable. We shall limit ourselves to ascertaining the truth in regard to his present mental state.”

Although Binet insisted upon these three fundamental maxims for use of his tests, each was later discounted. His original intentions were ignored, particularly by American hereditarians who believe that IQ is largely inherited, and who translated his scale into written form to use as a routine device for testing children.

Lemann (1999) explained that in 1905, American test promoters, led by Stanford professor Lewis Terman, pushed for the widest possible use of Binet’s test to measure IQ (Terman’s term). The U. S. Army’s use of the test with recruits during World War I was the first mass mental test in history, and became the foundation for transforming an abstract construct—IQ—into an ostensible, heritable and fixed human trait.

Based on his work analyzing intelligence test performance, Charles Spearman (1904) asked the question that traditionalists have sought to answer ever since:

“What is the latent structure of intelligence underlying observable scores on tasks used to measure intelligence?” In general the adherents to the IQ model of intelligence have continued to answer that question much in the manner as did Edwin Boring (1923), who espoused the operationist dictum that “intelligence is what intelligence tests test.” Boring’s answer notwithstanding, Spearman (1927) sought to answer his own question in his own theory of general ability, commonly known as “g,” which has probably been the most popular theory of
intelligence ever proposed. Spearman’s theory is predicated upon test scores analyzed using a statistical technique known as factor analysis, a technique developed by Spearman himself.

According to Sternberg (1997), other theories of the nature of intelligence have influenced the mental testing movement over the past century, although not as pervasively as Spearman’s. A comprehensive review of such theories is beyond the scope of this paper, yet, as a means of putting into perspective Sternberg’s model and the test predicated upon it, the author has provided brief overviews of the more influential models. Multifactorial theories such as those of Thurstone (1938) or Vernon (1971) contend that abilities are best understood as multiple in nature, with the exact number of abilities dependent upon the theory under consideration. Another theoretical approach of note is that of Jean Piaget. Piaget actually began his work in the field of mental ability and testing in the laboratory of Alfred Binet. Piaget parted with Binet, convinced that Binet paid too much attention to right answers rather than to wrong answers. Piaget (1972) developed a theory of how children and adults think. In his theory Piaget posits two critical processes, assimilation and accommodation, which are used to incorporate new information into existing structures and form new mental structures to incorporate new information, respectively. Piaget proposed his well-known theory of stages to specify levels of development that result from the equilibration (balancing) of assimilation and accommodation.

Hernstien and Murray (1994) proposed that the traditional method of schooling, coupled with the traditional view of intelligence inequality (based upon IQ scores resulting from test scores rooted in the concept of “g”) has created a caste system in the United States that is based largely on one’s employment. People with higher paying, white-collar jobs are generally people who performed well in school, and who scored well on intelligence tests and related tests such as the SAT. People who score positively on tasks necessary for good school performance have the
qualities that society has come to value most highly. These individuals are mainly college graduates known as the *Cognitively Elite*, a descriptor coined by Hernstein and Murray (1994) in their book, *The Bell Curve*. From their perspective, IQ becomes a good school performance predictor and vice versa.

Ironically, given that many social scientists cite socioeconomic status and environment as equally viable explanations for the caste system atop which the “cognitively elite” rest, Hernstein and Murray (1994) argued in favor of “g,” while Sternberg’s (1985) Triarchic Theory of Intelligence opposed the singular, heritable view of intelligence represented by “g.” In Sternberg’s view and that of other contemporary researchers, the general factor (g) of intelligence is in part an artifact of factor analysis. This method is mathematically designed to maximize the amount of variation that occurs in the first factor, resulting in a general factor rooted in mathematical operations rather than in cognitive functioning. (Sternberg, 1996).

Perhaps the most fundamental question to be answered in this debate is whether “g” is something Spearman discovered or something he invented.

Sternberg (1996) further noted that within the field of intelligence, there is still much contention between the Traditionalists and the Revolutionaries. The Traditionalists continue to adhere to the conventional paradigm that evolved from Binet and his student-turned colleague, Theodore Simon, who was involved in the development and deployment of the Stanford-Binet and the Weschler tests. Both tests are based on the same 1908 version of the test Binet developed in 1905 (Gould, 1996). Arguably these tests measure only a narrow range of abilities—the abilities required of children in a school setting.

According to Gould (1996), if Binet’s principles had been followed, and his tests consistently used as Binet intended, a great misuse of science in this century would have been
avoided. Gould (1996), commenting on Binet’s original intentions, asserted that the scores are a practical device that do not buttress any theory of intellect. They do not define anything innate or permanent and do not designate what they measure as intelligence or any other reified entity. The scale is a rough, empirical guide to identify mildly retarded children and learning-disabled children who need special help; it is not a device to rank normal children. Test results should emphasize special training for improvement, not label such children as innately incapable.

After a century of using test scores, many American school districts are reverting back to Binet’s originally intended use of testing. In recent years, theorists Howard Gardner and Robert Sternberg have broadened the definitions of human intelligence.

Learning-Style Theories

Less than a quarter century after the development and implementation of IQ testing, Carl Jung (1927) first proposed a learning-style theory. Jung noted major differences in the way that people perceived (sensation versus intuition), the way that they made decisions (logical thinking versus imaginative feelings), and how active or reflective they were during interaction (introversion versus extroversion). The psychological and educational communities did not immediately embrace Jung’s psychoanalytically-based theory that described differential methods of coping among people faced with similar circumstances.

Fifty years after Jung’s proposal, Isabel Myers and Katherine Briggs (1977) developed the Myers-Briggs Type indicator based on Jung’s work, and founded the Association of Psychological Type. These women influenced a generation of researchers seeking to understand specific differences in human learning.
Today, learning style theorists interpret personality in different ways, but nearly all models have two things in common: a focus on the process of learning (how individuals absorb information, think about information, and evaluate results), and an emphasis on personality. Learning style theorists generally believe that learning is the result of a personal, individualized act of thought and feeling (Silver, Strong, & Perini, 1997).

In the late 1960s, H.A. Whitkin developed the Embedded Figures Test that determines an individual’s field dependence and independence, and marks their global (field dependent) and analytic (field independent) orientations. In this procedure, an individual locates a simple figure within a complex design. In general, those who are field dependent or global, perceive things as a whole, make broad, general distinctions among concepts, tend to be people-oriented, and learn material in a social context. An individual, who is field independent or analytic, perceives things in parts, imposes structure or restrictions on information and concepts, sees little overlap, and tends to have impersonal relationships with the world (Guild & Garger, 1985). Cohen (1968) and Cross (1977) report that field-independent students tend to perform better in school. Renninger and Snyder (1983) report that field independents also perform better on standardized measures of academic ability.

In another approach to learning styles, Anthony F. Gregorc (1979) elucidated two sets of dualities in the acquisition of information: abstract versus concrete and sequential versus random. According to Gregorc, four sets of learning modes emerge from the two duality sets:

- Abstract Sequential: This learner can easily decode written, verbal, and image symbols. Symbols and pictures are important to this learner, as are well-organized, rational, and substantive presentations;
- Abstract Random: Skilled in sensing and interpreting atmosphere and mood, this learner associates the medium with the message, and a speaker’s manner, delivery, and personality are as important as what is spoken. This learner gathers information in an unstructured manner, reflects upon it, and then organizes it into a comprehensible pattern;

- Concrete Sequential: This learner prefers hands-on experience that employs all five senses, prefers step-by-step instructions and well-worded presentations, and defers to authority and guidance in the learning environment;

- Concrete Random: This learner likes to experiment, quickly ascertains the essential point of a question or problem, and uses intuition to draw a conclusion. She or he prefers a trial-and-error approach to gathering information, and does not welcome teacher-intervention.

M. F. Shaughnessy’s (1998) interview with Rita Dunn—an authority on learning styles—highlights the importance of Gregorc’s real-world applicability in learning style theory and research. Dunn stated that students achieve more when their teachers teach to the students’ learning styles. A meta-analysis of 42 experimental studies, conducted between 1980 and 1990 by 13 different institutions of higher education, yielded demonstrable results about educational intervention. When teachers accommodated students’ learning styles, those students could be expected to achieve 75% of a standard deviation higher than those students whose learning styles were not accommodated (Dunn et al., 1995).

Learning style approaches are not a panacea for education, however. Learning style models have both strengths and limitations. Silver, Strong, and Perini (1997) reported that learning style strengths include:

- A focus on how different individuals process information across many content areas;
• A recognition of the role of cognitive and affective processes in learning that help identify and resolve motivational issues;

• An emphasis on thought as a vital component to learning; and

• An avoidance of lower-level learning activities.

Silver, Strong, and Perini’s (1997) report noted that limitations of learning style models include those that:

• fail to recognize style variance in different content areas and disciplines;

• view learning styles as relatively permanent;

• are insensitive to the effects of learning context and purpose; and

• can be insensitive to the effects of context and purpose on learning--the effect of an environment altered to match or challenge a learner’s style.

Dunn and Dunn (1979) strongly believed that both achievement and motivation improve when learning styles and teaching styles are matched. Their Learning Styles Inventory, cited by Keefe (1992), is the most widely used learning style instrument in elementary and secondary schools, and elicits students’ reactions in four areas:

• The immediate instructional environment: sound, light, temperature, and seating design;

• Each person's emotionality, motivation, persistence, responsibility (conformity versus nonconformity), and structure (internal versus external);

• Social preferences: learning alone, in a pair with peers, in a small team, or with an adult; and
Physiological uniqueness: perceptual preferences (auditory, visual, tactile, kinesthetic), intake (eating, drinking, chewing, biting), time of day energy highs and lows, and mobility versus passivity needs.

**Sternberg’s Triarchic Theory of Intelligence**

Sternberg’s Triarchic Theory of Intelligence, describes three types of intelligence: analytical, creative, and practical. Analytical intelligence involves the ability to reason logically and mathematically; creative intelligence involves the ability to cope with new and novel tasks and situations; and practical intelligence involves the ability to solve problems that are uniquely posed within one’s surroundings—“street smarts.”

Sternberg’s (1984) Triarchic Theory of Intelligence also postulates three definable aspects or subtheories—the Componential or analytic, the Experiential or creative, and the Contextual or practical. These three aspects are the foundation for intelligent behavior. Sternberg (1997) asserts that the intelligent person is able to identify his personal strengths and weaknesses and then capitalize upon the strengths while compensating for the weaknesses.

The Componential subtheory is a combination of “g,” information processing theory, and metacognitive theory and describes the cognitive functions and processes that together produce intelligent behavior. Various kinds of mental operations (analytical intelligence similar to the standard psychometric definition of intelligence) process information: operations that define what should be asked and operations that seek to answer. Measured by analogies and puzzles, the Componential aspect reflects how an individual relates to his internal world. Good students and good test takers tend to excel in analytical intelligence, but they may not necessarily be creative
or practical. This aspect of intelligence can be further divided into Metacomponents, Performance components, and Knowledge-acquisition components.

The Contextual subtheory represents practical intelligence: the ability to grasp, understand, and solve real-life problems in the day-to-day world—“street smarts,” hence Sternberg’s nickname the “Streetsmart Psychologist.” Sternberg defines intelligence in terms of behavior in real-world environments to exclude fantasy environments—those invented in dreams or those constructed by a mentally ill person. Certain testing situations, regardless of how artificial or trivial they may be, do exist in the real world, and Sternberg asserts that to exclude test-like behavior from one’s view of intelligence is as faulty as it is to rely upon it exclusively.

The Contextual aspect concerns behavior in environments that are relevant or potentially relevant to one’s life. Sternberg’s (1985) example of an African pygmy maintains that a pygmy’s intelligence cannot be legitimately assessed if the researcher places the pygmy in a North American cultural environment and uses North American test criteria, unless the researcher tests the pygmy’s survival in a North American culture. Is it legitimate to say that a pygmy who has never driven an automobile is less intelligent than an American who drives an automobile every day? Conversely, can we regard the American as less intelligent than the pygmy, if she or he could not find food in the pygmy’s habitat? According to Sternberg, intelligence cannot be completely understood outside of a socio-cultural context.

The two-facet subtheory describes the creative intelligence that involves insight, synthesis, and the ability to react to novel stimuli and situations. On a continuous scale that ranges from the completely novel to extensive task or situation experience, this process reflects how an individual relates his or her internal world to external reality. The ability to readily handle novel situations in an adaptive manner or the process of automatizing performance is
indicative of intelligent behavior. For Sternberg, culturally intelligent behavior involves adapting to one’s present environment, selecting a more optimal environment, or reshaping one’s current environment. Although societal conventions are important in defining what constitutes intelligent behavior, Sternberg cautions that contextual theories alone do not place sufficient constraints upon behavior. Therefore a Contextual theory can only serve as a subtheory of a full theory of intelligence.

The expression of any intelligent behavior relates to the amount of experience a person has with the particular class of tasks being tested. For a given task or situation, contextually appropriate behavior is not equally intelligent at all points along the continuum of experience with a particular behavior or class of behaviors. Sternberg (1981) asserts that the best measure of intelligent thinking is the study of an individual’s ability to learn new kinds of concepts.

The Experiential subtheory, therefore, can be further divided into two categories: novelty—a reaction to a first exposure to a new scenario--and atomization—how a person handles repeated tasks. One intuitively learns when and how to apply learning; the appropriate application of a certain bit of knowledge or a particular technique becomes increasingly less a conscious effort as automation occurs. Sternberg refers to novel concepts as nonentrenched concepts, and in keeping with his thorough treatment of each facet of the components of the Triarchic Theory, Sternberg (1985) separates novelty into two classes: situational novelty and task novelty. He further suggests (1981) that intelligence is best measured by tasks that are non-entrenched (i.e., tasks that require information processing that are outside a person’s ordinary experience.)

In analyzing task performance, Sternberg distinguishes between two kinds of novelty: the comprehension of novelty—the understanding of the task to be performed— and the actual task
performance. Once one understands the task, the actual task performance is not necessarily difficult, particularly when the task is familiar, but the specific task requirements are somewhat novel. Raheim (as cited in Sternberg, 1985) noted that task usefulness in intelligence measurement is not a linear function of task novelty; to measure intelligence, tasks should not be outside an individual’s past experience. When a task is too novel, says Sternberg, the individual will not have the necessary cognitive structures to approach and complete the task. The task would be beyond the individual’s range of comprehension, much the way a calculus problem would be outside a mathematical novice’s range of comprehension.

The Experiential subtheory, therefore, places some constraints on the Contextual subtheory, specifying that demonstration of contextually intelligent behavior involves adaptation to novelty, automatization of information processing, or both. Sternberg further explained that there is an interaction between adaptation to novelty and automatization, the two facets of the experiential subtheory. The interaction denoted by Sternberg (1977, 1985) as efficacious automatization of processing and efficacious adaptation to novelty, works as follows: efficacious automatization of processing allows the allocation of additional resources to processing novelty in the environment. Efficacious adaptation to novelty, on the other hand, allows automatization to occur earlier in one’s experience with new tasks and situations. He claims that one cannot classify tasks as intelligence based on that. The intelligence requirement for a given task or situation depends upon the point in an individual’s experiential continuum at which he or she encounters a particular task or situation. The experiential continuum dictates whether contextually appropriate behavior is more or less intelligent.

Perkins and Salomon (1989) addressed automatization in terms of the interaction of knowledge and metacognition. They argued that the application of knowledge learned in one
context to another depends upon how well one understands a new concept, and on one’s ability to strategize, plan, and relate what one has learned to a specific instance. They further state that the more experience one has with a concept or operation, the more one can compensate for modest metacognitive abilities.

This stand does not conflict with Sternberg’s Triarchic Theory, because Sternberg stated that everyone possesses to varying degrees, each of the three intelligence types posited in the Triarchic Theory. Sternberg (1984, 1985) asserted that with novelty, automatization can occur in either task comprehension, task execution, or both. Failure to automatize the numerous and complex tasks involved in reading, for example, can lead to a breakdown in information processing, the manifestation of which may be a reading deficiency. According to Sternberg, intellectual operations that can be performed smoothly and automatically by more intelligent individuals are performed only haltingly and only under conscious control by less intelligent individuals.

Sternberg’s (1984) example of secondary school students encountering standard multiple-choice synonyms provides a clear picture of the automatization concept. When students are confronted with this measure of vocabulary, they likely need only to check whether it is a synonyms test versus another vocabulary-related task. Experience with similar tests may permit the students to merely glance over the instructions, paying close attention to only the task given; these students have automatized test-taking behavior. Answering the test items, however, requires the students to invest thought, particularly if they must discern distinctions in meanings.

Sternberg (1985) noted that much of the literature on aptitude-treatment interactions in task performance can be viewed as an attempt to understand how different kinds of environments support or inhibit learning as a function of the learner’s aptitude. Sternberg cites the laboratory
work of MacLeod, Hunt, and Matthews (1978), in which these researchers found that the optimal strategy for the promotion of rapid performance on sentence-picture comparison items was a function of the individual’s level of spatial ability. A spatial strategy worked better for some individuals, while a linguistic strategy worked better for individuals whose spatial ability test scores were lower.

Similarly, in a more real-world domain, reading studies by researchers (Baron & Strawson, 1976; Cronbach & Snow, 1977; Crowder, 1982) have all proven that certain methods of teaching lead to better reading or better skill automatization. The whole-word method appears better suited to certain ability patterns, the phonics method to others.

Sternberg noted that the ability to handle novelty and to automatize information processing, therefore, may occur along an experiential continuum. The crux of this supposition is that the ability to cope with novelty becomes an issue when one first encounters a task or situation type. A more intelligent person will be more readily able to handle the unfamiliar demands. As experience increases, novelty decreases, and the task or situation will become less of an accurate measure of intelligence.

From this perspective, intelligence encompasses not only the ability to learn and reason with new concepts, but also the ability to learn and reason with new kinds of concepts. Intelligence, then, is best demonstrated when a task is relatively novel or unfamiliar. A person might perform a particular task quite well in familiar circumstances, but that same person may falter when attempting to perform the same task in less familiar or more difficult circumstances. To legitimately assess intelligence, it is crucial, therefore, to recognize this interaction among tasks, situations, and persons, and to account for interactions among these variables.
The idea that a person’s adaptation to environmental change is not a new concept; it dates back at least to 1921, when novelty was described as a factor in intelligence and its measurement at a symposium held by the Journal of Educational Psychology. The key to the adaptive aspect of contextual intelligence is cultural specificity, for what is adaptive in one environment may be maladaptive in another; thus, behavior regarded as intelligent in one culture may be unintelligent in another. Sternberg cited as an example, “Latin American time.” In some Latin American cultures, it is usual, even customary, for business meetings to convene at a substantially later time than actually scheduled. In this culture, punctuality is maladaptive and therefore unintelligent because arriving on time is a waste of time.

Sternberg explained that another key to contextually intelligent behavior is the selection of one’s environment. He cited Cronbach and Snow (1977) who asserted that intelligent behavior involves the selection of an environment that enables one to capitalize on personal strengths while compensating for weaknesses.

The final qualification for contextually intelligent behavior is the shaping of one’s environment, especially when the use of one’s strengths has failed. Sternberg acknowledges the interactive nature in this process, asserting that people shape their environment as much as they are shaped by their environment—a process far too complex to be thoroughly accounted for by this theory.

Sternberg adds also that mental self-government focuses more on styles than on intelligence levels, pointing out that in standard intelligence theories—including his own and Howard Gardner’s—the emphasis is on levels of intelligence. Intelligence measurement assesses how much ability an individual possesses; mental self-government focuses on how an individual directs his or her intelligence.
Although the Componential and the Experiential subtheories serve to constrain the Contextual subtheory, Sternberg (1985) addressed the need to further limit the broad generality of the view of intelligence. Rather than viewing intelligence as a mental activity directed towards purposive adaptation, and as the selection and shaping of the real-world environment to one’s life within the contextual subtheory, he refined the contextual perspective by building six constraints into his theory of intelligence to attain a fit between the individual and his or her environmental context.

Sternberg’s (1988) development of a theory of mental self-government proposes a set of intellectual styles as a bridge between intelligence and personality. Cognitive and metacognitive strategies provide building blocks for constructing knowledge within the classroom. However, motivation, especially in distance education experiences, provides the fuel for student engagement. Without motivation, students will not use what they know or think about and will not organize their knowledge. Even teaching strategies for producing optimum learning will be fruitless if students are not motivated to use them.

Sternberg, therefore, posits three primary styles of mental self-government: legislative, executive, and judicial.

A legislative style characterizes individuals who enjoy creating, formulating, and planning problem solutions. These individuals create their own rules and methods for functioning. They prefer problems that are pre-structured or pre-fabricated and creative and constructive planning-based activities: writing papers, designing projects, creating new educational or business systems.

The executive style applies to individuals who are implementers or expediters. They like rules and structure, and use existing means to accomplish an objective. They also like predefined
activities: solving algebraic word problems, applying rules to pre-structured engineering problems, enforcing rules—and aspire to jobs like policeman, lawyer, surgeon, and builder (using another’s plans).

The judicial style involves judgmental activities. Individuals of this type evaluate rules and procedures for form and content, and analyze and evaluate existing things and ideas. They gravitate towards positions like judge, critic, program evaluator, or admissions officer. The response component is responsible for the implementation of the strategy or operation of problem solving produced by the metacomponents. The major concern with response components is their latency period (i.e., the time that elapses between a stimulus and a response.) Sternberg (1977) attributed research findings that show that response latencies in metacomponential functions decrease with age rather than to actual differences in performance component functioning.

Sternberg (1985) next proposed components of meta-componential functions used in gaining new knowledge: selective response, selective encoding, selective combination, and selective comparison. Selective encoding involves the combining of selectively encoded information into an integrated, sensible whole. Selective comparison involves comparing newly acquired information to information acquired in the past. Deciding what information to encode and how to combine it is guided by the retrieval of old information. Encoding components are concerned with the initial perception and storage of information, and qualitative changes constitute a major source of intellectual development. Sternberg noted that encoding tasks appear to be a critically important source of intellectual development in nearly all of the tasks that he has studied, but the importance of development of the combination and comparison component is much more variable.
Performance components execute various operations for task performance. Sternberg (1981) suggested that performance components tend to organize themselves into stages of task solutions that seem to be fairly general across tasks, and include the encoding of stimuli, the combination or comparison between stimuli, and response.

Sternberg (1981) explained that metacomponents are the specific realizations of control process and help to understand the general ways to approach problem solving; he identifies seven prevalent in intellectual functioning and provides (1981, 1985) extensive details related to each:

- Defining the problem;
- Selection of lower-order components to solve a given task;
- Selection of one or more representations or organizations to facilitate efficacy of a component;
- Selection of a strategy for combining lower-order components to perform a given task;
- Decision to allocate a resource to maximize the quality of the entire product;
- Solution monitoring: what has been done, is currently being done, and what needs to be done; and
- Sensitivity to external feedback to improve task performance.

**Long’s Reactive Behavior Patterns as a Cognitive Style Model**

The theoretical model of William A. Long, Jr. (1975, 1985) describes the reactive behavior patterns of adolescents to the problems they encounter in their environments. Long predicates his theory upon ambivalence—the parallel, conflicting feelings of an adolescent’s dependency on his or her parents or other authority figures, and a developing need for independence. Coupled with his experience as a physician treating adolescent patients in his
medical practice, Dr. Long developed his understanding of reactive behavior patterns within “the range of normal adolescent behavior.” He identifies and describes four basic personality types and four major ancillary personality traits. In his scheme, Long posits that a person demonstrates one behavior (personality) type, and at least one, but potentially all four, ancillary traits. Long uses the terms aggressive and passive to describe the energy level an individual displays in his or her environment, and dependent as an individual with a high need of approval; independent describes an individual that has relatively little need for approval. Long’s reactive behavior patterns theory, though founded on the premise of adolescent ambivalence (dependence-independence), serves as a hybrid between the intelligence theorists and the learning style theorists, and is directly related to Sternberg’s (1988) theory of mental self government outlined above. Recall Sternberg’s statement above that mental self-government, (i.e., how one applies one’s intelligence is as important as one’s level of intelligence.) This notion is reinforced in Long’s theory of reactive behavior patterns, which, in terms of the view that application of intelligence is as important as level of intelligence, becomes something of a cognitive styles theory.

The first personality type in Long’s classification system—the Aggressive Independent (AI)—is quite energetic, disposed to abrupt action, and expresses emotional energy into overt language or physical activity. The AI eschews the importance of approval from authority figures, parents, and peers, and acts out his or her emotions or impulses without the fear of reprisal.

In the classroom setting, AIs use confrontation to resolve stress, uncertainly, and indecision. They prefer to work independently and are somewhat disorganized. In leadership positions, they perform without peer pressure or perceived consequence of their actions. Aggressive Independents can be a real asset in the classroom, however, when their high energy
levels complete their superior ability and create a dynamic classroom atmosphere. A teacher’s real challenge is to establish external constraints and direct the AI’s activities until they are capable to formulate and implement their own control mechanisms. As the AIs mature, they emerge as spontaneous, direct individuals who handle situations as they encounter them.

The Aggressive Dependent (AD) is also energetic and active, but has a greater need for approval. Their need for approval ameliorates impulsive actions, so that they channel their energy into constructive and compliant activities. ADs demonstrate a mature work ethic; they are high achievers found in honors courses, service organizations, and athletic programs, and they achieve at amazingly high levels. They derive satisfaction from excellence because it brings them approval. Participatory in class, they regularly seek out the professor, and in group situations, emerge as peacemakers with a non-confrontational style.

Though overtly successful, accomplished, and gifted, they become depressed when they do not realize their goals. Not satisfied by another’s high regard, they suffer from self-imposed pressure of inadequacy, fear of rejection, or an inability to express anger or contrary opinions. The instructor should help these students find a balance in their pursuit of excellence.

The third personality type—the Passive Independent (PI)—has relatively low energy levels and tends to withdraw or quit when stressed. PIs, though apparently capable, stubbornly resist working to their capacity, often frustrating authority figures who try to motivate them to perform in a specific manner. Poor attendance and missed deadlines are common. When stressed or confronted, PIs withdraw and appear to be loners, often complaining of boredom. The PIs tend to develop low self-esteem as a result of their lack of diligence. Authority figures should devise alternative strategies to motivate when these students persist in behaving in ways contrary to their own best interests.
The Passive Dependent (PD) personality type is also a low-energy person whose emotional maturity develops slowly. This student’s pleasant, gentle, and extremely compliant demeanor identifies the PD who fears losing approval. Authority figures must exert a great deal of patience with PDs who are highly sensitive. In the classroom, these students are non-interactive.

The ancillary personality traits described by Long—impulsive, phobic, obsessive-compulsive, and hysteric—may influence the behavior of any of the four personality types positively or negatively, depending on the personality type and the degree to which the particular trait manifests itself. In the extreme, any of the ancillary traits may be problematic across all personality types.

A person possessing the impulsive trait acts with an apparent lack of forethought or judgment, and tends to be erratic and unpredictable. In the classroom setting, this student attempts to answer a question before the teacher has finished asking it, and is often admonished to think before acting or to consider the consequences of an action. An Aggressive Independent personality type, coupled with the Impulsive trait, may exhibit damaging behavior or lose control of a situation.

Individuals possessing the phobic trait experience specific fears and might act on those fears. Someone who develops school phobia early in life, for example, may carry this fear into adulthood where it could adversely affect his or her ability to learn presented material.

Long (1989) describes individuals with the obsessive-compulsive trait as careful and thorough with excessive concern for their appearance or study habits. These students are highly organized and methodical in their work habits. In extreme cases, though, the obsessive-compulsive individual may find working more crucial than the actual work she or he is doing,
developing ritualistic behavior that interferes with necessary work. Positively, this trait is associated with tenacious work ethics, academic excellence, and achievement (Dziuban, 1996).

Individuals with the hysteric trait are very dramatic and drawn to a crisis. They exhibit excessive emotional responses during stress or perceived pressure. Minor problems tend to escalate into crises. Dramatic and chaotic, hysterics are also innately compassionate and helpful. They are also highly creative and enchanting.

Dziuban, Moskal, and Dziuban (2000) assert that Long’s personality types form at the intersection of two dimensions: aggressive versus passive and dependent versus independent. The combination of these two dimensions provides an indication of the individual’s learning style. The applicability and relevance of Long’s theory extends beyond the practice of adolescent medicine; a number of studies have demonstrated its relevance to education, with predicted results based on Long’s reactive behavior patterns. Dziuban et al. (2000) assimilated information results from several studies that linked school children’s (of various ages and grade levels) classroom behavior and achievement levels to Long’s personality types. The researchers describe each child’s classroom behavior according to Long’s reactive behavior patterns and designate learning styles for each personality type (Cioffi, 1995; Dziuban, 1996; Dziuban & Dziuban, 1997). These results clearly suggest that a “one-size-fits-all” pedagogy approach (lecture/listen format) will not meet the needs of all students.

The diversity of motivational, emotional, and maturation characteristics found in the various personality types challenge educators to develop strategies to meet the needs of a diverse group of students.
The preceding literature review suggests that Sternberg, Long, and intelligence theorists and learning style theorists are all essentially describing the same phenomena. The fundamental issue is that measurable differences in behavior occur in a systematic fashion consistent with the various differentiating criteria described by the theorists. Table 1—adapted from Sternberg and Detterman (1986)—encompasses the tenets of 12 contemporary scholars in the field of cognitive science and intelligence theory. This framework for understanding contemporary conceptions of intelligence and the commonalities with learning styles theory, compliments and encompasses the tenets of Sternberg’s and Long’s approaches. The investigator did not include the biological perspective on intelligence because it is beyond the scope of this current study.

Theorists in the biological perspective domain hold that the locus of intelligence inheres in genetic factors, and structural aspects of the person (e.g., neuronal processes that give rise to evoked potentials). They also examine the interaction between structure and function (how certain regions of the brain generate particular evoked potentials) (Sternberg & Detterman, 1986).

Two perspectives of mental functioning described by Sternberg and Detterman (1986) are relevant for this study: the Molar Level (cognitive and motivational) and Behavioral Level. Motivational theorists focus on two primary motivational properties: the level or magnitude of motivation and the direction or disposition of motivation. These two properties influence what and to which degree something is learned. Anastasi (1986) stressed the motivational component of intelligence to adaptive behavior within the current environment, suggesting that certain cognitive and metacognitive functions are mediated to some extent by the adaptive process—a survival instinct underlies or drives purposive behavior. Manifestations of purposive, adaptive
behavior are similar to Clark Hull’s theory that behavior and learning are motivated by the maintenance of homeostasis; behavior that is adaptive in terms of a person’s or rat’s ambiance or physiologic need(s).

Long developed his theory based on his experience in the practice of adolescent medicine, and the research supporting his theory has been largely conducted with children and adolescents in school settings. The current study involves only individuals who are at least 18 years of age.

Table 1
A Comparison of Theories

<table>
<thead>
<tr>
<th>Contemporary View of Intelligence</th>
<th>Sternberg’s Triarchic Theory</th>
<th>Long’s Reactive Behavior Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Cognitive</td>
<td>Componential Subtheory</td>
<td>Interaction of Personality, Temperament, Trait(s) mediate cognitive functioning</td>
</tr>
<tr>
<td></td>
<td>Cognition Metacognition, Cognition</td>
<td></td>
</tr>
<tr>
<td>B. Motivational</td>
<td>Contextual Subtheory</td>
<td>Ambivalence</td>
</tr>
<tr>
<td></td>
<td>Purposiveness (Adaptation)</td>
<td></td>
</tr>
<tr>
<td>C. Behavioral</td>
<td>Intelligent behavior is situationally appropriate (adaptive)</td>
<td>Product of Personality x temperament x Trait interaction</td>
</tr>
</tbody>
</table>

Although the author developed the research instrument solely from Sternberg’s Multidimensional Abilities Test and the research supporting its development, the author later encountered the information about mental self-government. However, no matter how one conceptualizes the differences in human behavior, the fundamental issue remains that measurable differences in behavior occur in a systematic fashion consistent with the various criteria that the
cited theorists describe. Sternberg’s ideas about mental self-government closely describe the
cognitive styles appearing on the research instrument (Sternberg’s Task List) used in this study.
Those ideas may be useful in conceptually relating Sternberg’s Triarchic Theory to Long’s
 Reactive Behavior Theory.

If Long’s (1989) premise that personality is genetically determined, the graduate
students’ and the adolescents’ shortfalls stem from the same source despite their age differences.
Long (1985) mentions high-ability adolescents who do not realize their potential in school, and
Sternberg reinforces the prior by noting that two individuals of equal intelligence, however
measured, might nevertheless be regarded as intellectually quite different because of the
difference in their intellectual styles.

Similarly, Sternberg (1996) describes a gifted graduate student who, despite his academic
prowess, cannot achieve at a comparable success level in the academic job market. In
Sternberg’s example, the graduate can obtain employment, but cannot maintain a job because he
will not conform to his employer’s demands. Likewise, the adolescent in Long’s example would
not conform to the teacher’s demands to be successful in school. Although the circumstances are
different, in both situations, neither individual realizes his or her potential.

These scenarios depict people who fail to live up to the standards customarily achieved
by individuals of similar intelligence. Using Long’s paradigm, the author attributes the two
individuals’ behaviors to their Aggressive-Independent personalities combined with the
impulsive ancillary trait. In Sternberg’s scheme, the researcher attributes the graduate student’s
lack of career success to a lack of contextual (or practical) intelligence. He further reinforces the
prior example by noting that the two individuals of equal intelligence, with similar abilities,
might be regarded as intellectually quite different because of their intellectual styles.
The selection of one’s environment as the key to contextually intelligent behavior is particularly relevant to this researcher’s present research, for Sternberg determines that active selection of one’s environment is a key aspect of intelligent behavior. The respondents to the research instrument identify tasks that they perform well and those in which they feel less skilled. These respondents also make a career choice when they attempt to pass the real estate licensing examination involved in this study.

Recall the work of Cronbach and Snow (1977), and that Sternberg agrees with their view that intelligent behavior involves the selection of an environment that enables one to “capitalize upon one’s strengths and to compensate for one’s weaknesses.” Sternberg also suggests that metacognitive processes may play a more substantial role in career success in a given field than any particular ability. The higher order ability to use one’s competence in work is more important than giftedness in a particular field, according to Sternberg.

Long (1989), agreeing with other researchers in noting the enduring quality of personality, establishes an important precept for the current research. Personality types that may be identified and established during early childhood years will continue into adulthood. Variability in the propensity to learn material delivered in the lecture format might be manifested in evaluative results of a real estate licensing exam. However, that test, in reality, is actually a form of achievement test not substantially dissimilar to general academic achievement or aptitude tests: such as the SAT or GRE. A learning or test phobia developed early in life may manifest as a low score on the real estate licensing examination.

A second and related answer that is surfacing is that fine-grained cognitive analyses can be used beneficially to uncover individual differences in the information processing profiles of students (e.g., Carpenter, Just, & Shell, 1990). The human intelligence work of Robert Sternberg...
appears to offer a number of notable possibilities for adult education and seems to be particularly relevant to both practitioners and theoreticians alike.

Among those possibilities is infusing Sternberg’s Triarchic Theory of Intelligence into the school curriculum as an environmental intervention for increasing intellectual skills. The Triarchic Abilities Test was sent to a number of high schools throughout the United States and abroad where teachers administered the test to seniors planning to take a summer introductory psychology course at Yale (Sternberg, Grigorenko, Ferrari, & Clinkenbeard, 1999). The Triarchic Abilities Test, a detailed description of which is presented below, is structured to identify ability patterns consistent with the three general areas described in the Triarchic Theory – analytical, creative, and practical. The prediction in this study was that students who were matched in abilities, instruction, and assessment would perform better than those not so matched. The students were randomly assigned to sections of an introductory psychology course that emphasized teaching for analytical, creative, or practical thinking. Students of all three ability patterns in all instructional sections were assessed via instruments measuring analytic, creative, and practical accomplishments.

Having presented a detailed description of the Triarchic Theory of Intelligence, it seems appropriate to provide some detailed information about the Triarchic Abilities Test. The test reviewed in conjunction with this project was the Sternberg Triarchic Abilities Test Abbreviated Version, Level H (Sternberg, 1993). When this researcher contacted Dr. Sternberg to obtain a copy of the test, he (Dr. Sternberg) pointed out that the test was not standardized and that it was being revised.

The test is divided into a process facet and a content facet. There are three levels of the process facet and four levels of the content facet. The three process facets are analytic, creative,
and practical. The four content facets are verbal, quantitative, figural, and essay. Crossing of the three process facets and the four content facets yields 12 subtests, each of which is briefly described below:

1. Analytic-Verbal "Learning from Context"-- Subjects receive a brief paragraph with an embedded neologism (unknown word created especially for the test). Subjects have to infer the meaning of the unknown word from the context.

2. Analytic-Quantitative "Number series"-- Subjects receive a series of numbers, which they must complete.

3. Analytic-Figural "Figural Matrices"-- Subjects receive a figural matrix with one entry missing. They must choose which of several figures belongs in the empty cell of the matrix.

4. Analytic-Essay "Analytical Thinking"-- Subjects are presented with a school and must analyze the problem systematically.

5. Creative-Verbal "Nonentrenched Analogies"-- Subjects are presented with an analogy preceded by a counterfactual premise (e.g., "suppose that villains were lovable," or "suppose sparrows played hopscotch"). Subjects have to solve the analogy as though the premise was true.

6. Creative-Quantitative "Novel Number Systems"-- Subjects have to do mathematics problems using novel number operations (e.g., two numbers x and y are added if x is less than y and multiplied if x is greater than y, and divided if x equals y).

7. Creative-Figural "Series Mapping"-- Subjects must complete a figural series. The rule, however, is illustrated in a series other than one they have to complete.
8. Creative-Essay "Creative Thinking"-- Subjects have to write a creative essay envisioning their ideal school.

9. Practical-Verbal "Informal Reasoning"-- Subjects read a paragraph describing a high school student with a life problem. They have to select which of several answer options provided the best solution to the student's problem.

10. Practical-Quantitative "Everyday Math"-- Subjects have to solve problems using everyday protocols, as in following recipes, using train or bus schedules, computing the cost of tickets to sporting events, etc.

11. Practical-Figural "Route planning"-- Subjects are shown maps of amusement parks, parts of cities, etc., and must plan efficient routes for getting from one place to another, given constraints.

12. Practical-Essay "Practical Thinking"-- Subjects are given a problem faced in school and asked how they would solve it.
CHAPTER 3: METHODS AND PROCEDURES

The specific research questions in this study were:

1. What relationship exists between Long’s reactive behavior patterns and the examination scores of candidates for real estate licensure in Florida?

2. What relationship exists between cognitive strengths based on Sternberg’s Triarchic Theory and the real estate licensure examination scoring patterns?

3. What relationship exists between Long’s reactive behavior patterns and Sternberg’s Triarchic Theory of differential performance on cognitive tasks?

As explained in Chapter 2, both Long’s and Sternberg’s theories specify constructs that might be assumed to be associated with higher levels of achievement. For purposes of this study, level of achievement was measured by scores obtained on the Florida real estate licensure examination. Specifically, Long (1985, 1989) described Aggressive Dependents as high academic achievers, leaders, and honor students. Among other qualities, Sternberg (1985) characterized persons who rank high in analytical intelligence as good traditional test takers.

Participants

The subjects for this study were approximately 600 applicants for licensure as real estate salespersons in Florida. The sample consisted of persons scheduled to take the real estate licensing examination at one of 12 testing centers operated by Prommissor, the State’s contracted computer-based testing provider. All applicants were given a copy of the research instrument (Appendix E) and a cover letter (Appendix F) that explained the rationale for the study. They were all told that participation was optional. The resulting sample is best characterized as a representative-convenience volunteer group. The sample was not scientifically random; the only
mechanism for inclusion or exclusion from the study was the applicants’ willingness to participate. The sample is assumed to be representative because candidates who tested and participated during the period through which the data were collected may be considered similar to all candidates who schedule and take exams at other times. This assumption is well supported by item analysis data from the real estate salesperson examination form(s) administered during the period of the study. Both the distribution of scores and the test and item statistics were consistent with those from previous administrations of the same test form(s) and items.

**Instruments**

The research instruments for this study consisted of two separate and distinct parts: the *Long-Dziuban Inventory* and the *Sternberg Task List* (Appendix C). These two instruments yielded three variables for the analysis, Long Type (LT), Sternberg Type (ST), and an ancillary trait vector (Anc) derived from the *Long-Dziuban Inventory*. The properties of each of these variables will be described in detail below. The third instrument used in the study was the Florida Real Estate Licensure Examination.

**The Long-Dziuban Inventory**

The *Long-Dziuban Inventory* is a convenient survey instrument, the first part of which asks respondents to read four lists describing general behavior patterns. Considering each list as a whole, the respondent must identify (check) the one list that best describes him or her. The second part asks the respondent to review four lists of characteristics, each representing one of the four ancillary personality traits described in Long’s theory. Consistent with Long’s view that any individual can possess as few as none and as many as all four of these traits – phobic,
compulsive, hysterical, impulsive, the respondent is asked to identify (check) as many as he or she believes applies to himself or herself. In theory, respondents can check from zero to four traits, in any combination.

As noted in Chapter 2, although the Long-Dziuban measure has not been used as extensively as the Myers-Briggs, it has had sufficient use to establish it as a valid, reliable instrument (Weins & Dziuban, 1996; Cioffi & Kysilka, 1997). Long’s reactive behavior patterns, particularly as measured by the Long-Dziuban Inventory, offer advantages over other style typology measures such as the Myers-Briggs. It is extremely easy to use, and it requires no special training. The simplicity of the instrument greatly enhances its utility, given that little time is required for respondents to read the few lists of descriptive phrases and check the ones that fit them most closely.

Although using the Long-Dziuban Inventory requires no training beyond a familiarity with, and an understanding of, the different behavior types and traits described by Long, it is important to point out that the different traits and types posited in Long’s theory do not suggest any sort of pathology. All of these behaviors are normal, and people may function within all of them quite well. In common language, terms such as impulsivity, hysteria, and aggressiveness often carry negative connotations. However, Dziuban and Dziuban (1999), assert, that “Although these labels sound pathological, Long’s intent is to desensitize readers and emphasize that each one of his types has many positive qualities…” (p. 86). It is also important to remember that despite how these descriptions are worded, they are meant to reflect behaviors and not biologically ingrained personality differences.
In sum, the eight lists of descriptive phrases in the *Long-Dziuban Inventory* yield two variables for the analysis: a Long type and a trait profile, each of which represent “normal” components of the reactive behavior patterns described by Long.

**The Cognitive Strengths Task List**

As explained in the Chapter 2 literature review, Sternberg, Ferrari, Clinkenbeard and Grigorenko (1996), citing Sternberg (1985, 1986, 1988), assert that the Triarchic Theory distinguishes among three kinds of intellectual ability: analytical, creative, and practical. Individuals gifted in these different ways excel in different activities. Individuals with strong analytical ability are talented in analyzing, evaluating, and critiquing. People with high creative intelligence excel at discovering, creating, and inventing. Highly practical people are good at utilizing and applying. Based upon these three distinctions in cognitive or intellectual ability this researcher, with input from Robert Sternberg, constructed *The Cognitive Strengths Task List*. The Task List was patterned after the *Long-Dziuban Inventory* in that it was designed to be brief and easy to use. Each of the three tasks on the List incorporates one of the three cognitive abilities hypothesized by the Triarchic Theory (referred to as process facets in the *Triarchic Abilities Test*). Given that the List asks respondents to identify which of the three tasks they believe they would perform best, it also incorporates another tenet of the Triarchic Theory, a proposition that has implications for succeeding in the real world, which, according to Sternberg (1986, 1988) is one of the criteria of intelligent behavior. Recall from Chapter 2 Sternberg’s belief that the intelligent person is one who knows his or her strengths and weaknesses and tends to shape his or her environment to maximize use of his or her strengths while minimizing reliance on and compensating for his or her weaknesses. In another construct validation study, similar to the one
by Sternberg and Clinkbeard (1992), described in Chapter 2, Sternberg, Ferrari, Clinkbeard, and
Grigorenko (1996) obtained similar results, confirming that the cognitive abilities (or facets) in
Sternberg’s theory and test are valid constructs.

In addition to studying the theory precedent to devising the Task List, the researcher
obtained a copy of the Sternberg Triarchic Abilities Test (Modified) Level H Abbreviated
Version (1993) from Dr. Sternberg who, as noted above, graciously supplied his comments, as
well as supporting documentation for this project. Although the Task List is untried and thus its
reliability unproven, Sternberg’s characterization of the instrument as a “nice measure” coupled
with the research supporting the construct validity of both the Triarchic Theory and the Triarchic
Abilities Test, indicate that the List may be useful in predicting test performance. The validity of
this measure can be further affirmed by comparing the scoring patterns of the groups formed by
responses to the List. The statements on the List were structured to avoid asking respondents to
identify what they prefer to do, for Sternberg pointed out that “People do not always like to do
what they do well, and that they do not always do well what they like to do” (personal
communication, 2000). Procedurally, the Task List was straightforward and simple. Respondents
were asked to identify which of the three tasks they believed they would do best. The responses
to the List yielded a single variable for the analysis designated as “Styp” for “Sternberg Type.”

Florida Real Estate Examination

The Florida Real Estate Salesperson Licensing Examination is a 100 question, multiple
choice achievement test designed to assess the minimal competence of applicants for real estate
licensure to practice the profession without harming the public. The 100 test items are divided
into three classes: 45 law, 45 principles and practices, and 10 math. The law portion assesses the
applicant’s understanding of general real estate law, Florida real estate license law, and other Florida laws pertinent to real estate practice, as well as relevant federal laws such as the Fair Housing Act and the Uniform Commercial Code.

The principles and practices portion of the exam addresses conceptual and procedural elements such as valuation techniques, real versus personal property, legal descriptions, bundle of rights in real property, and building styles and construction details. The math portion of the exam covers basic business arithmetic, including proportions, percentages, area calculations, and interest calculations.

The examination content was established by means of a task analysis from which a blueprint was created. The task analysis survey was designed by Florida Real Estate Commission psychometric personnel, including this researcher, incorporating input from subject matter experts (SMEs), real estate practitioners, real estate professors, and members of the Florida Real Estate Commission. The cut score, which is the criteria for passing the exam, is set by the Florida Real Estate Commission in its administrative code at 75 correctly answered questions. Subscores for the three sections of the test are not considered; the passing criterion is simply answering 75 of the 100 questions correctly.

The validity of the test is established through the task analysis and ongoing review by SMEs and psychometricians. Reliability estimates and item properties are obtained through traditional item analysis statistics including the KR-20, item difficulty (expressed as the proportion of individuals correctly answering the item), point-biserial correlation coefficients, and variance statistics (percent correct multiplied by percent incorrect). The test is administered via computer terminal, but computer adaptive methodology is not employed.
Data Analysis

As noted in Chapter 1, the salesperson examination score data collected in this study were subjected to two types of analysis, one in which the respondents’ exam performance was evaluated as a dichotomous (binary) categorical variable (pass/fail) using the Crosstabs procedure in SPSS and where the overall examination score was used as an interval measure.

The Crosstabs procedure in SPSS creates, among other alternatives, a row by columns table with the chi-square test of independence. The chi-square test in the current analysis is used to test the statistical hypothesis that passing or failing a real estate licensing exam, reactive behavior patterns, and Sternberg cognitive type are independent of one another. Regardless of variables entered into the table, the chi-square test may be expressed as testing the proportionality of the conditional and marginal proportions.

The observed cell frequencies are organized by the Crosstabs procedure into rows and columns like a spreadsheet. The crosstabs procedure in SPSS creates $R \times C$ contingency tables for categorical variables. The discrepancies among the expected conditional frequencies generated by the marginals under the null hypothesis are distributed as chi square with $(R-1) \times (C-1)$ degrees of freedom. The point hypothesis associated with the test is that the variables under consideration are independent. The chi-square statistic is the sum of the contributions from each of the individual cells. Every cell in a table contributes something to the overall chi-square statistic. If a given cell differs markedly from the expected frequency, then the contribution of that cell to the overall chi-square is large. If a cell is close to the expected frequency for that cell, then the contribution of that cell to the overall chi-square is low. A large chi-square statistic indicates that somewhere in the table the observed frequencies differ markedly from the expected frequencies. It does not tell which cell (or cells) are causing the high
chi-square (Bluman, 1992). If the computed chi square value meets or exceeds the 95\textsuperscript{th} percentile value of the sampling distribution for degrees of freedom (R-1) (C-1) the independence hypothesis is rejected.

The second procedure used was the one-way analysis of variance (ANOVA). The hypothesis associated with the procedure is simultaneous means equality in the population. The test statistic is distributed as F with k-1 and n-1 degrees of freedom—where k is the number of cells in the design and n is the total sample size. The significance of the procedures gives the probability that the sample means come from a population that conforms to the null hypothesis. Once again if the computed value equals or exceeds the 95\textsuperscript{th} percentile of the sampling distribution dp = (k-1, n-1) the hypothesis is rejected. For both tests the .05 level of significance was the basis of hypothesis rejection.
CHAPTER 4: RESULTS

As explained in Chapter 3, the researcher interpreted the test score data both as binary in terms of passing or failing the examination and as an interval-level measurement in the Score variable. After entering the data into an SPSS data file, the first step undertaken was the pass/fail assessment (75% of the items correct) of the exam performance data in terms of the various Long and Sternberg groupings resulting from the questionnaire responses.

The results of the crosstabulations of licensure examination pass rates by Long Types and Traits are presented in Tables 2 through 6.

Table 2
Distribution of pass/fail scores for each Long type

<table>
<thead>
<tr>
<th>Long Type</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>75</td>
<td>21.9</td>
<td>42</td>
<td>22.8</td>
<td>117</td>
<td>22.2</td>
</tr>
<tr>
<td>PI</td>
<td>26</td>
<td>7.6</td>
<td>13</td>
<td>7.1</td>
<td>39</td>
<td>7.4</td>
</tr>
<tr>
<td>AD</td>
<td>228</td>
<td>66.7</td>
<td>120</td>
<td>65.2</td>
<td>348</td>
<td>66.2</td>
</tr>
<tr>
<td>PD</td>
<td>13</td>
<td>3.8</td>
<td>9</td>
<td>4.9</td>
<td>22</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>342</td>
<td>65.0</td>
<td>184</td>
<td>35.0</td>
<td>526</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2 contains the pass-fail rates on the licensure examination by the Long types as well as the overall pass-fail rates and the percentage of respondents in each Long Type. Table 2 shows that 65% of the examinees passed the examination (failure rate = 35%). It also shows that 66.2% of the respondents identified themselves as aggressive dependents, 22.2% were aggressive independent, 7.4% were passive independent, and 4.2% associated themselves as passive dependent. The largest pass rate (66.2%) was associated with aggressive dependents. The next
highest pass rate (21.9%) was found in passive independents, followed by passive independents (7.6%) and passive dependents (3.8%). The failure rates showed a close correspondence to the AD type pass rates and both corresponded closely to the percentage of each type. This resulting chi square value of .47 with 3 degrees of freedom and an associated probability of .63 caused a failure to reject the statistical independent hypothesis. The resulting chi square value of .47 with 3 degrees of freedom and associated probability of .63 indicated that there was a 63% chance that the sample differences could be generated from a population in which the null hypothesis was true. Formally stated the hypothesis Ho: independence could not be rejected in terms of the study variable passing the real estate examination was independent of status on the Long types.

Table 3 presents the crosstabulation of the phobic trait with passing the licensure examination. For these respondents 25.2% indicated that they possessed this trait. Of those examinees passing the examination 24.7% indicated that they were phobic. Of individuals failing, 26% indicated that they were phobic. The chi-square from this table was .11 with 1 degree of freedom and an associated probability of .74, indicating that the phobic trait is independent of examination passing rates.

Table 3
Distribution of pass/fail scores for the Phobic trait

<table>
<thead>
<tr>
<th>Trait</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>283</td>
<td>75.3</td>
<td>148</td>
<td>74.0</td>
<td>431</td>
<td>74.8</td>
</tr>
<tr>
<td>Yes</td>
<td>93</td>
<td>24.7</td>
<td>52</td>
<td>26.0</td>
<td>145</td>
<td>25.2</td>
</tr>
<tr>
<td>Total</td>
<td>376</td>
<td>65.3</td>
<td>200</td>
<td>34.7</td>
<td>576</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 4 presents the crosstabulation of examination pass rates with the compulsive trait, which 65.6% of the examinees indicated they possessed. Of those passing the examination 65.6% were compulsive while 34.4% were not. Those percentages closely corresponded to those passing the examination (65.0% yes, 34.3% no). The chi-square value for the table was .99 with 1 degree of freedom and an associated probability of .32, leading to failing to reject the independence hypothesis leading to the conclusion that passing the examination was independent of status on the compulsive trait.

Table 4
Distribution of pass/fail scores for the Compulsive trait

<table>
<thead>
<tr>
<th>Trait</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>130</td>
<td>34.4</td>
<td>68</td>
<td>34.3</td>
<td>198</td>
<td>34.4</td>
</tr>
<tr>
<td>Yes</td>
<td>248</td>
<td>65.6</td>
<td>130</td>
<td>65.6</td>
<td>378</td>
<td>65.6</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
<td>65.6</td>
<td>198</td>
<td>34.4</td>
<td>576</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5 contains the crosstabulation of the impulsive trait with passing the licensure examination. Table 6 shows that 21.0% of the examinees claimed the impulsive trait. Of those passing the examination 19.7% were phobic, while 23.3% of those failing claimed this trait. The chi-square value of .99 with 1 degree of freedom and an associated probability of .32 once again lead to failure to reject the independence hypothesis.
Table 5
Distribution of pass/fail scores for the Impulsive trait

<table>
<thead>
<tr>
<th>Trait</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>313</td>
<td>80.3</td>
<td>155</td>
<td>76.7</td>
<td>468</td>
<td>79.0</td>
</tr>
<tr>
<td>Yes</td>
<td>77</td>
<td>19.7</td>
<td>47</td>
<td>23.3</td>
<td>124</td>
<td>21.0</td>
</tr>
<tr>
<td>Total</td>
<td>390</td>
<td>65.9</td>
<td>202</td>
<td>34.1</td>
<td>592</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 6 presents the results of the crosstabulation of the hysterical trait and passing the examination. Table 6 shows that 21.0% of the examinees claimed the hysterical trait. Of those who passed 22.8% identified themselves as hysterics. In the failing group 19.7% of the examinees claimed to be hysteric. The chi-square value of .72 with 1 degree of freedom and an associated probability of .40 lead to a non-rejection of the independence hypothesis—once again showing independence between the Long trait and passing the examination.

Table 6
Distribution of pass/fail scores for the Hysterical trait

<table>
<thead>
<tr>
<th>Trait</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>292</td>
<td>77.2</td>
<td>163</td>
<td>80.3</td>
<td>455</td>
<td>78.3</td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>22.8</td>
<td>40</td>
<td>19.7</td>
<td>126</td>
<td>21.0</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
<td>65.1</td>
<td>203</td>
<td>34.9</td>
<td>581</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7 presents the relationship between the Sternberg cognitive types and the pass-fail rates on the licensure examination. Table 7 shows that 54.1% of the examinees identified themselves as practical, 27.7% as analytical, and 18.2% as creative. Of those examinees passing the examination 53.9% identified themselves as practical, 30.3% as analytical, and 15.8% as
creative. The percentage of Sternberg cognitive types failing the examination showed a loose correspondence to those in the passing group. This table produced a chi-square value of .63 with 2 degrees of freedom and associated probability of .04, leading to a rejection of the independence hypothesis indicating that the Sternberg cognitive types were not independent of passing the real estate examination.

Table 7
Distribution of pass/fail scores for each of Sternberg’s Cognitive Types

<table>
<thead>
<tr>
<th>Sternberg’s Cognitive Type</th>
<th>Pass (n)</th>
<th>Percent</th>
<th>Fail (n)</th>
<th>Percent</th>
<th>Total (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical</td>
<td>119</td>
<td>30.3</td>
<td>46</td>
<td>22.8</td>
<td>165</td>
<td>27.7</td>
</tr>
<tr>
<td>Analytical</td>
<td>62</td>
<td>15.8</td>
<td>46</td>
<td>22.8</td>
<td>108</td>
<td>18.2</td>
</tr>
<tr>
<td>Creative</td>
<td>212</td>
<td>53.9</td>
<td>110</td>
<td>54.4</td>
<td>322</td>
<td>54.1</td>
</tr>
<tr>
<td>Total</td>
<td>393</td>
<td>66.1</td>
<td>202</td>
<td>33.9</td>
<td>595</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 8 presents the crosstabulation of the Long types with the Sternberg cognitive types.

Within the Sternberg practical category 27.2% of the examinees chose the aggressive independent Long type, 8.1% selected passive independent, 61.8% aggressive dependent, and 2.9% passive dependent. For the analytical classification 17.0% of the respondents were aggressive independent, 7.5% were passive independent, 72.3% were aggressive dependent, and 3.2% claimed to be passive dependent. The creative Sternberg category showed 21.2% as aggressive independent, 7.5% as passive independent, 66.4% as aggressive dependent, and 4.8% as passive dependent. The chi-square associated with the table was 4.78 with an associated probability of .57 leading to a failure to reject the independence hypothesis.
Table 8
Distribution of Long types by Sternberg’s cognitive types

<table>
<thead>
<tr>
<th>Long Type</th>
<th>Practical</th>
<th>Practical %</th>
<th>Analytical</th>
<th>Analytical %</th>
<th>Creative</th>
<th>Creative %</th>
<th>Total</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>37</td>
<td>27.2</td>
<td>16</td>
<td>17.0</td>
<td>62</td>
<td>21.2</td>
<td>115</td>
<td>22.0</td>
</tr>
<tr>
<td>PI</td>
<td>11</td>
<td>8.1</td>
<td>7</td>
<td>7.5</td>
<td>22</td>
<td>7.5</td>
<td>40</td>
<td>7.7</td>
</tr>
<tr>
<td>AD</td>
<td>84</td>
<td>61.8</td>
<td>68</td>
<td>72.3</td>
<td>194</td>
<td>66.4</td>
<td>346</td>
<td>66.3</td>
</tr>
<tr>
<td>PD</td>
<td>4</td>
<td>2.9</td>
<td>3</td>
<td>3.2</td>
<td>14</td>
<td>4.8</td>
<td>21</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>136</td>
<td>26.0</td>
<td>94</td>
<td>18.1</td>
<td>292</td>
<td>55.9</td>
<td>522</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9 contains the mean licensure examination scores by Long types with the associated sample sizes and standard deviations. The highest mean (78.26) was obtained by the passive independents, followed by the aggressive dependents (75.51), aggressive independents (74.88), and passive dependents (72.61). Table 10 shows that those means were not significantly different (p=.15). Table 11 contains the mean licensure examination scores by the Sternberg cognitive types. The highest mean was obtained by analyticals (76.89) followed by practicals (75.18) and creatives (73.88). Table 12 shows that these means were significantly different—apparently between analyticals and creatives.

Table 9
Mean real estate licensure examination scores by Long types

<table>
<thead>
<tr>
<th>Long type</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>74.88</td>
<td>117</td>
<td>10.71</td>
</tr>
<tr>
<td>PI</td>
<td>78.26</td>
<td>39</td>
<td>9.45</td>
</tr>
<tr>
<td>AD</td>
<td>75.51</td>
<td>347</td>
<td>9.64</td>
</tr>
<tr>
<td>PD</td>
<td>72.61</td>
<td>23</td>
<td>11.91</td>
</tr>
<tr>
<td>Total</td>
<td>75.44</td>
<td>526</td>
<td>10.00</td>
</tr>
</tbody>
</table>
Table 10
Analysis of variance for Long type by real estate licensure examination score

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>531.93</td>
<td>3</td>
<td>177.31</td>
<td>1.78</td>
<td>.15</td>
</tr>
<tr>
<td>Within Groups</td>
<td>51,961.97</td>
<td>522</td>
<td>99.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52,493.90</td>
<td>525</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11
Mean real estate licensure examination scores by Sternberg types

<table>
<thead>
<tr>
<th>Sternberg type</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyticals</td>
<td>76.89</td>
<td>165</td>
<td>9.05</td>
</tr>
<tr>
<td>Creatives</td>
<td>73.88</td>
<td>108</td>
<td>10.39</td>
</tr>
<tr>
<td>Practical</td>
<td>75.18</td>
<td>322</td>
<td>10.20</td>
</tr>
<tr>
<td>Total</td>
<td>75.42</td>
<td>595</td>
<td>9.97</td>
</tr>
</tbody>
</table>

Table 12
Analysis of variance for Sternberg cognitive type by real estate licensure examination score

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>631.30</td>
<td>2</td>
<td>315.65</td>
<td>3.20</td>
<td>.04</td>
</tr>
<tr>
<td>Within Groups</td>
<td>58,387.66</td>
<td>592</td>
<td>98.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59,018.96</td>
<td>594</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the data analyses presented in this chapter have shown, generally, that the Long Types and Traits were not predictive of test performance for this group of prospective real estate licensees. The Sternberg cognitive abilities were shown to be statistically significantly
related to exam performance, both in terms of passing or failing in terms of differential mean exam score.
CHAPTER 5: CONCLUSIONS

The fields of education and psychology contain large bodies of literature that relate learning styles to cognition. An implicit and accepted (though not universal) assumption infers that the acquisition of information enables the learning process. This supposition gives rise to pedagogical claims that teachers should tailor their instructional techniques and materials to those learning preferences. Research in this area, however, is inconclusive; some investigators make strong claims for the learning styles and cognition connection, while others dismiss it as a vacuous and unfounded assumption.

In this study, the author casts that hypothetical relationship in a different context by incorporating evolving models for learning style and knowledge acquisition in a venue not typically considered in this discussion—real estate licensure certification. The author incorporates Long’s reactive behavior patterns into his formulation, but only as one component of a more comprehensive theory that considers licensure examinees’ intellectual capacity, education, maturity, sophistication, and character in the testing situation; the author also formulates knowledge acquisition into a trichotomy of practical, analytical, and creative components.

Test Scores and Competence

The real estate licensure examination is not the predictor of success in real estate sales. The exam measures factual knowledge, but cannot predict a candidate’s success, or if a candidate will act responsibility or ethically. When a test score is not the predictor of success, the determination of a passing score, and the meaning of that cut score, is difficult for the real estate
commission to interpret. The only method to determine a passing score is by expert judgment because to determine and use a single passing score runs the classic risk of misclassification.

Ideally, there are two passing scores: the score that the candidate meets or exceeds providing strong evidence that minimal knowledge exists to practice real estate sales; and the lower score that if not met, bears reasonable certainly that a candidate has not attained the requisite knowledge. Unfortunately, classic measurement practices determine only one passing score that carries the risk to fail some candidates who should have passed, and to pass some candidates that should not have passed. In Florida, policy statement, empowered by Florida law 75 out of 100 percent correct determines the passing score.

At present, most testing and measurement work concentrates on minimizing these classification errors. Those errors, however, are not the type one and type two errors in the statistical hypothesis testing sense. They derive this meaning from classic measurement theory in terms of differences between true and observed scores. Researchers must determine the score that will assure reasonable competence to protect Florida citizens from real estate agents who are deficient in knowledge about real property and real estate law. Some form of performance appraisal would be preferable, but the sheer volume of applicants and the complexity of regulating the industry dictates that the examination format be used for certification.

**Predicting Licensure with Reactive Behavior Patterns**

The results of this study conclude that assessment of learning style in candidates does not effectively predict examination success. Because of this finding, the author speculates that learning style has little to do with memorization of material. This conclusion raises a conundrum: a large portion of individuals that obtain a license do not succeed. Conversely, a legitimate
question asks what portion of the candidates that failed the examination might have the requisite skills for success and might have efficiently obtained additional facility on the job. This kind of speculation probably is most appropriate for those examinees that scored “close” to passing.

A potentially more important study would assess the job performance of those passing candidates through the lens of their reactive behavior patterns—a task that would have to consider additional components: (e.g., earnings, satisfaction, longevity, customer satisfaction, ethical characteristics, and the absence of formal complaints). Individuals entering the real estate profession after passing the examination, however, are novices who believe that there are context-free rules for most situations they encounter. Unfortunately, for them, selling real estate is a fluid process, requiring not only knowledge of facts, procedures, and law, but also great flexibility and intuition in dealing with the best interests of prospective clients. Agents usually gain this second skill set only after several years in practice.

A contingency scoring process may be a more reliable indicator to predict success in the real estate industry, a process that uses the judgment of successful realtors to specify those necessary components (determined by consensus) they deem most important to a “successful career.” Rather than a pass/fail outcome of the examination, applicants would be informed of the quality of their skills as well as their knowledge.

**Predicting Licensure with Cognitive Abilities**

The results of this study suggest that knowledge of a person’s cognitive ability bears some predictive weight for passing the real estate examination. Those persons with analytical and creative abilities do better on the exam (Table XIII). The triarchic model used here, however, suggests that effective predictions view intellectual capacity in terms of primary mental abilities.
that form a multidimensional. The cognitive model used here is not a model of intellectual capacity, but a model of intellectual style.

An even more complicating element in this study shows that cognitive ability is largely unrelated to a person's reactive behavior pattern. The independence of these constructs, as well as the finding that cognition is, at best, a weak predictor of licensure, invites speculation that the probability of success lies in constructs other than those used in this study. These findings further complicate the task creating one that might be prohibitive in terms of value added.

Prototype knowledge, skills, and attitudes that lead to success in real estate may well be the precursor to comprehensive, predictive, and diagnostic models, however. Such models might streamline the real estate educational system, the regulation mechanism, and the disciplinary procedures. Considering cognitive, affective, and behavior characteristics applicants might lead to a morphological connectionism model whereby one might examine the interactions among components. Prototype models emerge from this system; e.g., a candidate might possess strong cognitive abilities that will earn a passing grade with a superior score, but lack the sophistication, motivation, and the maturity to succeed in the field, while a candidate with marginal scores might possess the business acumen that results in a long term, highly productive career. A third category also exists: the candidate who does well on the exam, and who possesses the necessary supporting abilities and attributes, but who lacks character development. These realtors may be candidates for disciplinary hearings for unethical or illegal activities.

The Diagnostic Possibilities of Cognition and Reactive Behavior Patterns

This study focused on reactive behavior and cognitive patterns that predict successful completion of a certification examination, and also examined the covariance between those two
constructs. Canonical reasoning, therefore, suggests that there may be some weighted combination of these two variables, and possibly others, that might form the basis of better predictive models. This research might also offer the potential to develop a system that has diagnostic capabilities that offer the candidate a profile analysis of their strengths and the areas in which they need remediation or further study, and also identify a criterion for certain constructs; e.g., real estate law or preparing a closing statement. Profile scoring would suggest that this candidate must achieve acceptable levels on those two sub-sections before she or he acquires a license.

The canonical approach permits the inclusion of many more such variables in the predictive model with the complexity of design offset by the predictive efficiency. Cost effectiveness in developing models is the fundamental question with multiple variable considerations. In the final analysis, this hinges on the purpose of the certification process. In a regulatory sense the present process probably yields the best return on investment. If, however, a more diagnostic and prescriptive approach becomes more desirable in the future, a more comprehensive approach may yield the best return on the process.

Future Research

This study raises a number of future research possibilities to maximize the potential of the Florida real estate sales person’s licensure examination: constructs that better predict pass/fail (cognitive, affective, and behavioral domains) and the development of a coherent model of the “successful” real estate practitioner. Although the latter seems rudimentary, academic fields such as education, psychology, sociology, business administration, marketing, finance, and law all have theoretical bases that might coalesce into a working “Theory or Model of the Real Estate
professional.” Additional research possibilities include the ability to assess the degree to which the licensure exam predicts financial success, client satisfaction, or longevity in the real estate profession, and the ability to initiate a careful deconstruction of the successful real estate sales person’s habits to develop more effective diagnostic and predictive models.

Predictive models for success in the real estate industry, depending, of course, on the operational definition of success, have implications far beyond the regulatory domain. Because of the limited scope and purpose of the regulatory function performed by the Department and Professional Regulation, the impetus for development of predictive models extending beyond examination performance and regulatory concerns would likely come from trade organizations or from real estate brokerage firms seeking an effective and efficient means of reducing their risk in the selection of sales personnel, particularly with newly licensed sales associates. Predictive modeling would provide some assurance that the training resources invested in new hires will pay dividends in terms of sales production, longevity, and customer satisfaction.
APPENDIX A: FLORIDA REAL ESTATE COMMISSION RULE
61J2-2.029 Examination Areas of Competency.

(1) The answers to the Broker, Salesperson and Instructor examination shall be graded on the basis of 100 points for a perfect examination. An applicant who receives a grade of 75 points or higher shall be deemed to have successfully completed the licensure examination. The salesperson examination shall be based upon a knowledge, understanding and application of real estate principles and practices, real estate law and real estate mathematics as contained in the Commission prescribed prerequisite Education course syllabus for licensure as a real estate salesperson. To the extent these subject areas can reasonably be separated, 45 points shall be based on law, 45 points on principles and practices and 10 points on real estate mathematics. The broker and instructor examinations shall be based upon a knowledge, understanding and application of real estate law, real estate principles and practices including appraising, finance, investment and brokerage management and real estate mathematics. To the extent these subject areas can reasonably be separated, 45 points shall be based on law, 40 points on principles and practices and 15 points on real estate mathematics.

(2) A successful applicant may lawfully practice the services of real estate provided employment information is on file with the DBPR.

Specific Authority 475.05 FS. Law Implemented 455.217(1)(b) FS. History–New 1-1-80, Amended 4-13-81, Formerly 21V-2.29, Amended 6-28-93, Formerly 21V-2.029, Amended 1-18-00.
APPENDIX B: FLORIDA STATUE ESTABLISHING MINIMUM EDUCATIONAL REQUIREMENTS FOR THOSE WHO WANT REAL ESTATE LICENSE
475.17 Qualifications for practice.--

(1)(a) An applicant for licensure who is a natural person must be at least 18 years of age; hold a high school diploma or its equivalent; be honest, truthful, trustworthy, and of good character; and have a good reputation for fair dealing. An applicant for an active broker's license or a salesperson's license must be competent and qualified to make real estate transactions and conduct negotiations therefor with safety to investors and to those with whom the applicant may undertake a relationship of trust and confidence. If the applicant has been denied registration or a license or has been disbarred, or the applicant's registration or license to practice or conduct any regulated profession, business, or vocation has been revoked or suspended, by this or any other state, any nation, or any possession or district of the United States, or any court or lawful agency thereof, because of any conduct or practices which would have warranted a like result under this chapter, or if the applicant has been guilty of conduct or practices in this state or elsewhere which would have been grounds for revoking or suspending her or his license under this chapter had the applicant then been registered, the applicant shall be deemed not to be qualified unless, because of lapse of time and subsequent good conduct and reputation, or other reason deemed sufficient, it appears to the commission that the interest of the public and investors will not likely be endangered by the granting of registration. The commission may adopt rules requiring an applicant for licensure to provide written information to the commission regarding the applicant's good character.

(b) An application may be disapproved if the applicant has acted or attempted to act, or has held herself or himself out as entitled to act, during the period of 1 year next prior to the filing of the application, as a real estate broker or salesperson in the state in violation of this chapter. This paragraph may be deemed to bar any person from licensure who has performed any of the acts or services described in s. 475.01(3), unless exempt pursuant to s. 475.011, during a period of 1 year next preceding the filing of the application, or during the pendency of the application, and until a valid current license has been duly issued to the person, regardless of whether the performance of the act or service was done for compensation or valuable consideration.

(2)(a)1. In addition to other requirements under this part, the commission may require the satisfactory completion of one or more of the educational courses or equivalent courses conducted, offered, sponsored, prescribed, or approved pursuant to s. 475.04, taken at an accredited college, university, or community college, at an area technical center, or at a registered real estate school, as a condition precedent for any person to become licensed or to renew her or his license as a broker, broker-salesperson, or salesperson. The course or courses required for one to become initially licensed shall not exceed a total of 63 classroom hours of 50 minutes each, inclusive of examination, for a salesperson and 72 classroom hours of 50 minutes each, inclusive of examination, for a broker. The satisfactory completion of an examination administered by the accredited college, university, or community college, by the area technical center, or by the registered real estate school shall be the basis for determining satisfactory completion of the course. However, notice of satisfactory completion shall not be issued if the student has absences in excess of 8 classroom hours.
2. A distance learning course or courses shall be approved by the commission as an option to classroom hours as satisfactory completion of the course or courses as required by this section. The schools authorized by this section have the option of providing classroom courses, distance learning courses, or both. However, satisfactory completion of a distance-learning course requires the satisfactory completion of a timed distance learning course examination. Such examination shall not be required to be monitored or given at a centralized location.

3. Such required course or courses must be made available by correspondence or other suitable means to any person who, by reason of hardship, as defined by rule, cannot attend the place or places where the course or courses are regularly conducted or does not have access to the distance learning course or courses.

(b) A person may not be licensed as a real estate broker unless, in addition to the other requirements of law, the person has held:

1. An active real estate salesperson's license for at least 12 months during the preceding 5 years in the office of one or more real estate brokers licensed in this state or any other state, territory, or jurisdiction of the United States or in any foreign national jurisdiction;

2. A current and valid real estate salesperson's license for at least 12 months during the preceding 5 years in the employ of a governmental agency for a salary and performing the duties authorized in this part for real estate licensees; or

3. A current and valid real estate broker's license for at least 12 months during the preceding 5 years in any other state, territory, or jurisdiction of the United States or in any foreign national jurisdiction.

This paragraph does not apply to a person employed as a real estate investigator by the Division of Real Estate, provided the person has been employed as a real estate investigator for at least 24 months. The person must be currently employed as a real estate investigator to sit for the real estate broker's examination and have held a valid and current salesperson's license for at least 12 months.

(c) A person who has been licensed as a real estate salesperson in Florida during the preceding 5 years may not be licensed as a real estate broker unless, in addition to the other requirements of law, she or he has completed the salesperson post-licensure educational requirements, if these requirements have been prescribed by the commission pursuant to paragraph (3)(a).

(3)(a) The commission may prescribe a post-licensure education requirement in order for a person to maintain a valid salesperson's license, which shall not exceed 45 classroom hours of 50 minutes each, inclusive of examination, prior to the first renewal following initial licensure. If prescribed, this shall consist of one or more commission-approved courses which total at least 45 classroom hours on one or more subjects which include, but are not limited to, property management, appraisal, real estate finance, or the economics of real estate management. Required post-licensure education courses must be provided by an accredited college, university,
or community college, by an area technical center, by a registered real estate school, or by a
commission-approved sponsor.

(b) Satisfactory completion of the post-licensure education requirement is demonstrated by
successfully meeting all standards established for the commission-prescribed or commission-
approved institution or school. However, notice of satisfactory completion shall not be issued if
the student has absences in excess of 10 percent of the required classroom hours or has not
satisfactorily completed a timed distance learning course examination.

(c) The license of any salesperson who does not complete the post-licensure education
requirement prior to the first renewal following initial licensure shall be considered null and
void. Such person wishing to again operate as a real estate salesperson must requalify by
satisfactorily completing the salesperson's pre-licensure course and passing the state examination
for licensure as a salesperson.

(d) A salesperson who is required to complete any post-licensure education requirement must
complete any post-licensure education requirement in order to be eligible for licensure as a
broker.

4(a) The commission may prescribe a post-licensure education requirement in order for a
person to maintain a valid broker's license, which shall not exceed 60 classroom hours of 50
minutes each, inclusive of examination, prior to the first renewal following initial licensure. If
prescribed, this shall consist of one or more commission-approved courses which total at least 60
classroom hours on one or more subjects which include, but are not limited to, advanced
appraisal, advanced property management, real estate marketing, business law, advanced real
estate investment analyses, advanced legal aspects, general accounting, real estate economics,
syndications, commercial brokerage, feasibility analyses, advanced real estate finance,
residential brokerage, or real estate brokerage office operations. Required post-licensure
education courses must be provided by an accredited college, university, or community college,
by an area technical center, by a registered real estate school, or by a commission-approved
sponsor.

(b) Satisfactory completion of the post-licensure education requirement is demonstrated by
successfully meeting all standards established for the commission-prescribed or commission-
approved institution or school. However, notice of satisfactory completion shall not be issued if
the student has absences in excess of 10 percent of the required classroom hours or has not
satisfactorily completed a timed distance learning course examination.

(c) The license of any broker who does not complete the post-licensure education requirement
prior to the first renewal following initial licensure shall be considered null and void. If the
licensee wishes to operate as a salesperson, she or he may be issued a salesperson's license after
providing proof that she or he has satisfactorily completed the 14-hour continuing education
course within the 6 months following expiration of her or his broker's license. To operate as a
broker, the licensee must requalify by satisfactorily completing the broker's pre-licensure course
and passing the state examination for licensure as a broker.
(a) The commission may allow an additional 6-month period after the first renewal following initial licensure for completing the post-licensure education courses for salespersons and brokers who cannot, due to individual physical hardship, as defined by rule, complete the courses within the required time.

(b) Except as provided in subsection (4), salespersons and brokers are not required to meet the 14-hour continuing education requirement prior to the first renewal following initial licensure.

(c) 1. A distance learning course or courses shall be approved by the commission as an option to classroom hours as satisfactory completion of the post-licensure education course or courses as required by this section. The schools or sponsors authorized by this section have the option of providing classroom courses, distance learning courses, or both. However, satisfactory completion of a distance learning post-licensure education course or courses requires the satisfactory completion of a timed distance learning course examination. Such examination shall not be required to be monitored or given at a centralized location.

2. The commission shall provide for post-licensure education courses to be made available by correspondence or other suitable means to any person who, by reason of hardship, as defined by rule, cannot attend the place or places where courses are regularly conducted or does not have access to the distance learning courses.

(6) The post-licensure education requirements of this section, and the education course requirements for one to become initially licensed, do not apply to any applicant or licensee who has received a 4-year degree in real estate from an accredited institution of higher education.

History.--s. 18, ch. 12223, 1927; CGL 4079; s. 1, ch. 24090, 1947; s. 1, ch. 57-244; s. 2, ch. 59-200; ss. 2, 3, ch. 69-378; s. 1, ch. 74-343; s. 1, ch. 75-106; s. 1, ch. 75-117; s. 3, ch. 76-168; s. 1, ch. 77-116; s. 1, ch. 77-238; s. 1, ch. 77-457; ss. 11, 42, 43, ch. 79-239; s. 206, ch. 79-400; ss. 2, 4, 5, ch. 80-405; ss. 2, 3, ch. 81-318; ss. 13, 38, ch. 82-1; s. 57, ch. 83-329; ss. 8, 28, 30, ch. 88-20; s. 26, ch. 88-392; s. 1, ch. 89-76; s. 13, ch. 90-228; s. 13, ch. 90-341; s. 16, ch. 90-345; s. 10, ch. 91-89; s. 4, ch. 91-429; s. 6, ch. 93-62; s. 6, ch. 93-261; s. 137, ch. 94-119; s. 365, ch. 97-103; s. 1, ch. 98-116; s. 4, ch. 98-250; s. 1, ch. 2002-9.
APPENDIX C: CONTENTS OF THE FLORIDA REAL ESTATE COMMISSION PRESCRIBED PRELICENSING COURSE
Florida Real Estate Commission

SALESPERSON COURSE SYLLABUS

(FREC COURSE I)

January 1, 2001
(effective date)
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Dear Candidate for licensure:

The attached questionnaire is designed to help the Florida Real Estate Commission learn more about the population it educates, examines, and regulates. The information from the completed questionnaire will be used to help the Education and Examination Section of the Division of Real Estate evaluate current pre-licensing, post-licensing, and continuing education courses in terms of the intended consumers of these educational products.

By volunteering to complete the questionnaire, you will be helping the Florida Real Estate Commission to better understand the learning styles and general cognitive strengths and weaknesses of the people who take required FREC courses and examinations. The information will be useful in designing new courses and exams and in modifying existing courses and exams, to more precisely match the learning styles and personalities of the individuals who participate.

Note that all the information from these questionnaires will be aggregated and analyzed to identify group patterns. Individual responses will be kept strictly confidential and will only be identified by candidate number. Only group data will be available for making the decisions about the courses and exams noted above.

Again, on behalf of the Florida Real Estate Commission and the Division of Real Estate, I extend my thanks to you for agreeing to complete this questionnaire.

Sincerely,

Herbert S. Fecker, Jr.

Director
APPENDIX E: THE LONG/DZIUBAN AND STERNBERG INVENTORY
The Long/Dziuban Inventory

Directions: The following four lists describe general behavior patterns. Please review each list and check the one that, in your opinion, best describes you. Consider each list as a whole, remembering that you may not show every behavior on the list.

_A_  
- Highly energized and action-oriented
- Little need for approval; unconcerned with who they please
- Is an act-outer who puts thinking into immediate action
- Is very frank, speaking out freely
- Is truthful about feelings
- Is impulsive and quick-tempered
- Uses confrontation to resolve conflict, ambiguity, or stress
- Dislikes positive or agreeable people
- Exhibits leadership ability

_B_  
- Lower energy level
- Little need for approval – unconcerned with pleasing others
- Independent, strong-willed and sometimes stubborn
- Can be non-communicative
- Prefers to work alone
- Passively resists pressure from authority
- Withdraws from confrontation
- May express boredom

_C_  
- Highly energized, a superior achiever and highly productive
- Strongly motivated and seeks approval
- Sensitive to the wishes of others; may apologize under pressure
- Exerts control over aggression and translates energies into constructive tasks
- May show sadness rather than anger
- Deeply values close bonds with others
- Some difficulty dealing with direct confrontation
- Highly idealistic, setting lofty goals for themselves
- Fosters harmonious relationships

_D_  
- Lower energy level
- Needs approval -- concerned with pleasing others
- Rarely shows anger or resentment
- Very sensitive to the feelings of others
- Very compliant and loyal Forms strong attachments-- tends to do only what is required Gives and thrives on affection

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Directions: The following lists describe four auxiliary traits observed in people. Once again, please consider each list as a whole, remembering that you may not show every behavior on the lists you choose, You may check as many lists as you feel really apply to you.

<table>
<thead>
<tr>
<th>Trait 1</th>
<th>Trait 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Focused exaggerated fears based on dangers</td>
<td>• Highly organized and methodical</td>
</tr>
<tr>
<td>• Thinks of all possibilities and contingencies before ventured into activities</td>
<td>• Strongly motivated to finish tasks</td>
</tr>
<tr>
<td>• &quot;What if&quot; ... person</td>
<td>• Perfectionistic</td>
</tr>
<tr>
<td>• May see the negative side of things</td>
<td>• tends to form habits--- extremely diligent in work habits</td>
</tr>
<tr>
<td>• Unwilling to take risk</td>
<td>• May be mildly ritualistic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trait 3</th>
<th>Trait 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sometimes explosive and quick tempered</td>
<td>• Emotionally labile</td>
</tr>
<tr>
<td>• Sharp tongued</td>
<td>• Dramatic</td>
</tr>
<tr>
<td>• Very frank</td>
<td>• Wide mood swings</td>
</tr>
<tr>
<td>• Short attention span</td>
<td>• Tends to overreact -- exaggerates situations</td>
</tr>
<tr>
<td>• May act without thinking</td>
<td>• Loves bright colors</td>
</tr>
<tr>
<td></td>
<td>• Prone to emotional outbursts</td>
</tr>
<tr>
<td></td>
<td>• Creative thinker (rich imagination)</td>
</tr>
<tr>
<td></td>
<td>• Artistically inclined</td>
</tr>
<tr>
<td></td>
<td>• devalues routine work</td>
</tr>
</tbody>
</table>
Thinking skills – Task Performance Self-rating Scale

Below are three lists (A, B, C) of thinking/ performance skills and tasks. Read each item in each list and decide which list best describes skills.

__ List A
• Compare and contrast (recognize and explain the similarities and differences between ideas, objects, issues)
• Analyze (comprehend and correctly solve complex math or algebra word problems and/or understand the meanings of unfamiliar words from the context in which they are used)
• Evaluate (Read or listen to a scenario or situation and understand its implications for you and/or others and use as a basis for decision making)
• Say why in your judgement (Explain in your own words why a situation, event, or activity happened or is done.
• Explain why (choose from among alternative explanations the best explanation for a particular situation, event, or activity)

__ List B
• Create (write a creative essay envisioning the ideal real estate brokerage)
• Invent (Think up a new solution or devise a new implement or tool for a particular purpose or application)
• Design (conceives and plan out in the mind)
Say what would happen if (Explain the most likely outcome of alternative courses of action)

__ List C
• Apply (solve problems using everyday math: following recipes, balancing a checkbook, use a map to plan an efficient route, Select from several alternatives the best solution for a real-life)
• Adapt to your surroundings (Use your intuition and experience to decide on the correct behavior and or course of action to make you successful in your current circumstances, or use your street smarts to survive and/or succeed in your current circumstances)
• Implement (given a particular assignment, project, or objective be able to allocate the necessary time material, and human resources to accomplish the task)
• Show/ explain how you can use (teach someone to use a tool, a calculator or computer program to accomplish a particular task)
• Show how you would use in the real world (explain or demonstrate how a particular sales or listing technique can be used to bring about desired results)
MEMORANDUM

TO: Test Center Personnel
FROM: Dan Combs, Exam Development Specialist
RE: Administration of Research questionnaire/ Survey for DRE
DATE: March 1, 2000

The survey (research instrument, questionnaire) consists of three pages. As stated in the cover letter bearing DRE Director Herb Fecker's signature. Participation (filling out the survey) is voluntary. The survey should be provided only to persons taking the real estate salesperson exam. Instructions for completing the survey are provided in the survey itself. Combined with the information provided in the cover letter. Those who agree to complete the survey should have no problem understanding what to do. All of the questions on the survey are about the person who is completing it. They only need to answer truthfully. No more than 10 minutes should be required to complete it. Most will probably finish in five minutes, perhaps less. The volunteers should turn in the survey before they are given their tests.

Please submit the completed surveys to me Dan Combs at the Division of Real Estate once every week through March 31. That will facilitate timely recording of the data from the completed surveys.

Thank you.
APPENDIX G: FLORIDA REAL ESTATE SALESPERSON TEST PLAN
Florida Real Estate Salesperson Test plan

A. Category  1 03-03(Fair Housing/ Discrimination) NR QUES= 2

B. Category  1 01-02(Contracts/ Deeds) NR QUES= 2
101 Types of contracts, breach
102 Types of deeds

C. Category  1 04-05 (Real Estate Taxes)  NR QUES= 1
104. Property Taxes, Real Estate related Federal Income taxes
105. Convetance of title, chain of title, title insurance

D.  Category  1 31-45(various License Law, Gen RE Law Topics)  NR QUES= 2
131 Notice of investigations, appeal of suspension, requirements of real estate profession
132 Appeal of final order
133 Allowable actions by a broker, communication of offers to purchase
134. Who pays broker's commission?, Licensee commission dispute, emission rate
135. Corporations: Sole, foreign
136. Earnest money deposits
137. Easements
138. Eminent domain
139. Broker's principal, client
140. Encroachments
141. Escheat
142. Escrow accounts
143. Estate by the entireties
144. Fiduciary relationship
145. Foreclosure

E. Category  1 61-74 (General R.E. Law & Lic. Law)NR QUES= 2
161 Homesteads, Homestead exemption
162 Valid deed: requirements for
163 Investigator's, authorized activities in investigations, subpoenas
164 Types of Business relationships
165 Interest conferred by lease
166 Liens
167 Activities rights responsibilities granted in listing contract
168 Partnership activities: liability, responsibility
169 Separate property vs. community property
170 Equity of redemption
F. Category 2 01-24 (FREC Rules/ Discipline) NR QUES= 32

201 Hearings, probable cause, orders, appeal process
202 Advance fees
203 Advertising by licensee, broker office signs
204 Branch office registration & operation
205 Broker obligations to purchaser and seller in contracts, disclosure.
206 Referrals, broker sharing & payment of commissions
207 Real Estate brokerage corporations
208 Receipt of earnest money by Salesperson, Broker
209 Escrow (trust )accounts
210 Identification of situations requiring licensure
211 Identify honest (lawful) vs. dishonest (unlawful) Licensee transactional behavior
212 Identify Fraudulent Licensee behavior
213 Various License Law topics: Investigations, Hearings, Discipline
214 License-related topics: Renewal, Registration of salesperson w/ broker, Suspension
215 Business structures Partnerships, sole proprietorships, corporations
216 Violations & Penalties
217 Real Estate Recovery Fund
218 Real Estate Brokerage business relationships
219 Rental property location fees
220 Criteria (violations, situations) for revocation, suspension of license
221 Real Estate Salesperson duties, rights, responsibilities
222 Unlicensed Activity: (lawful/unlawful) Identification, consequences of unlawful unlicensed activity
223 Real Estate License Law violations
224 Referrals, referral fees

G. Category 2 41-49 (Lic. Law/Contracts: Application) NR QUES= 2

241. Investigations
242. Offers to purchase, sales contract issues
243. Permissible, impermissible salesperson activities
244. Broker Illegal activities: Snitch Law, Equity trading schemes
245. Permissible business activities and compensation of foreign brokers
246. Kickbacks, rebates
247. Broker Placing lien, recording contract to collect commission
248. Listing contract-related topics
249. Illegal sales/marketing plans
H. Category 2 71-79 (Re. Law/Lic. Law: Application) NR QUES= 2

271 Blanket mortgages
272 Real property definition
273 Illegal rebates, kickbacks
274 Blank
275 FREC rulemaking
276 Statue of frauds
277 Broker rendering opinion of title
278 Broker: Concealment, failure to account or deliver
279 Broker operating under trade name


301 Broker & salesperson employment, compensation, (commission earned) agency relationships
302 Appraisal concepts, practices
303 Brokerage practices: broker, salesperson, duties to principal, business processes, procedures
304 Closing Statement knowledge questions
305 Brokerage commission -related
306 RE contracts: sales, options, contract for deed, leases
307 Deeds conveyances
308 Depreciation
309 Eminent domain- condemnation topics
310 Earnest-money Deposits, escrow accounts, deposit disputes
311 Regulation Z, RESPA
312 Government-backed mortgage loan program: FHA,
313 Mortgage-related: notes, bonds, insurance, mortgage types, sources of mortgage credit
314 Customers, principals, licensee fiduciary duties
315 Foreclosure-related topics
316 Mortgage-related government organizations- Federal
317 RE investment-related topics
318 Legal descriptions
319 Licensing-related topics: Ch. 475
320 Listing-related: Types, provisions
321 Mortgage-related : LTV, discount points, discount rate, interest
322 Mortgage lenders and mortgage lending practices, govt monetary policy, points
323 Mortgage Types
324 Obsolescence: functional, external
325 Planning, zoning
326 Real property interests, Fixtures, deed restrictions, condemnation
327 Real Estate Market-related
328 Real estate (property) tax-related topics
Title transfer, proof of ownership, title searches,
Deed restrictions, planning, zoning, economic base study, police power,
building codes

J. Category  3 41-59 (Brokerage Operation, U.S. Tax Law, R.E. Dev.Doc Stamps NR
QUES= 4

Advance fees
Advertising: Blind ad, institutional, name, specific
Capital gains tax: sale of principal residence
Income capitalization
Custom building vs. tract & speculative building
Doc. Stamps on deed & note, metes & bounds legal description
Easements
Estoppel certificate
Identifying fraudulent activity by broker
Gross rent multiplier
Homestead exemption
Intermediation
Acreage, Sq. Ft. percentage calculations
Injunction
Sublease, short-term lease
Liens, Title theory, mortgage definition
Lis pendens
Assessed value vs. market value, anticipation, estimating present value of future
income, Just value

K Category  3 71-87 (Income cap., R.E. Finance, Deposits, Fixtures Brokerage Bus.
NR QUES= 4

Income capitalization
Promissory note issues
Disposition of deposit: withdrawn offer to purchase Licensee duty of full
disclosure to principal
Partnerships
FREC disciplinary authority
Personal property/fixtures
Property management
Real property characteristics: sites, physical components, conformity
Real Estate Recovery Fund
Salesperson's responsibilities, duties, permissible activitiSigns
Signs
Principle of Substitution
Tenancies: joint, in common
Broker using trade name
Government mortgage-related agencies: FNMA, FHA, VA
Violations/penalties: concealment, culpable negligence, fraud, misrepresentation

L. Category 4 01-12 (R.E. Math) NR QUES= 10

401 percentage calculations, comparable sales approach cost approach calculations
402 commission-related calculations
403 Mortgage-related math
404 Income capitalization approach
405 Insurance calculations
406 Mortgage-related math
407 Legal descriptions, area-value calculations
408 Mortgage amortization
409 Price/cost related calculations
410 Rental/lease income calculations
411 Property tax prorations and related calculations, Income tax on income property
412 GRM, Income approach calculations, comparable sales approach calculations, cost approach calculations
APPENDIX H: AUTHORIZATION TO USE LONG-DZIUBAN INSTRUMENT
To: Daniel Combs

From: Charles Dziuban

Date: February 3, 2003

Dear Mr. Combs:

You have my permission to use the Long/Dziuban Reactive Behavior Inventory for data collection in your dissertation work. Best wishes for a successful study.

Sincerely,

Charles D. Dziuban
Director
APPENDIX I: IRB APPROVAL FORM
February 3, 2003

Dan Combs
PO Box 560036
Montverde, FL 34756

Dear Mr. Combs:

With reference to your protocol entitled, “Assessing the Efficacy of Self Reported Reactive Behavior Patterns and Cognitive Abilities,” I am enclosing for your records the approved, executed document of the UCFIRB Form you had submitted to our office.

Please be advised that this approval is given for one year. Should there be any addenda or administrative changes to the already approved protocol, they must also be submitted to the Board. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur. Further, should there be a need to extend this protocol, a renewal form must be submitted for approval at least one month prior to the anniversary date of the most recent approval and is the responsibility of the investigator (UCF).

Please accept our best wishes for the success of your endeavors.

Cordially,

Chris Grayson
Institutional Review Board (IRB)

Copies: Dr. Charles Drinon,
IRB File
LIST OF REFERENCES


Boring, E. G. (1923). Intelligence as the tests test it. New Republic, 6, 35-37.


