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**AN EXAMINATION OF ACCOUNTING STUDENTS'  
THINKING STYLES**

**A Dissertation**

**Presented in Partial Fulfillment of the Requirements for the**

**Degree of Doctor of Philosophy**

**with a**

**Major in Education**

**in the**

**College of Graduate Studies**

**University of Idaho**

**by**

**R. Wes Tucker**

**May 1999**

**Major Professor: Terry R. Armstrong, Ed. D.**

**UMI Number: 9936922**

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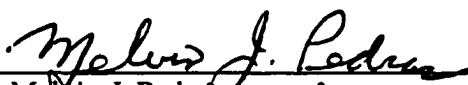
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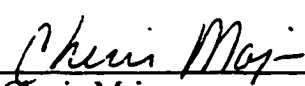
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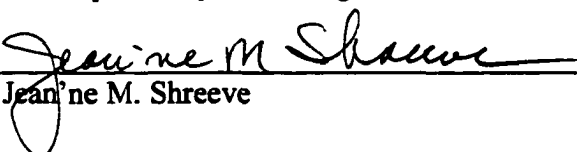
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## ABSTRACT

The problem of this study was to identify and examine thinking styles used by introductory accounting course students and accounting major students using the Sternberg-Wagner Thinking Styles Questionnaire. It is postulated that thinking styles may be a useful concept in improving accounting education, and possible future development of individual's intellectual skills necessary for success in the accounting profession.

Research in the cognitive process science and opportunities for the improvement in teaching and assessment are briefly discussed.

The Thinking Styles Questionnaire was administered to accounting students (N=235) at a major university and a community college in the Pacific Northwest. Five hypotheses were tested using data obtained from the questionnaire.

The data were analyzed using descriptive statistics, box plots, one-way analysis of variance, and Van der Waerden procedures. The responses to the Sternberg-Wagner Thinking Styles Inventory revealed numerous differences between sub-scale scores when students were compared by age, major, stage of accounting study, and gender.

The dominant Thinking Styles identified for accounting majors indicated an individual very similar to that described by researchers using the Kolb Learning Style Instrument and the Myers-Briggs Type Indicator in research of accounting professionals and accounting students. The theory of thinking styles shows promise for understanding cognitive processes and improvement in accounting education.

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## CHAPTER ONE

### Introduction

#### Background to the Problem

Rapid changes in information technology during the last quarter of the 20<sup>th</sup> century had an extreme affect on the accounting profession. The development and use of expert systems, smart agents, relational databases, and neural networks have allowed the automation of many tasks previously performed by accountants. The advent of on-line data processing provides information in “real time” rather than days, weeks, or months after an economic event has occurred. Information technology improvement, and real time processing of data, decreased the cost of providing information and allowed more punctual reports to internal and external users of financial information. (Romney, Steinbart, and Curshing, 1997)

With the improvements in information processing technology there occurred a shift in demand for the services performed by accountants. The change in demand was examined by Brackney and Helms (1996). The findings of Brackney and Helms were indicative of the changes in the public accounting environment where the traditional services of compilation and bookkeeping, audits of financial statements and tax accounting were decreasing, and management consulting services were increasing. The technological changes and shift in services occurred within an increasingly complex global economy with a growing interdependency among an economic entity and its suppliers. (Bell, Marrs, Solomon, & Thomas, 1997) The accounting profession was confronted with a technological change, a shift in service demands, and a multifaceted global economy.

Responding to the above challenges, the accounting profession was compelled to examine the nature of services demanded, and technological and intellectual skills required

for success. The American Accounting Association (AAA) (Bedford Committee, 1986) examined accounting education at the college/university level. The committee found little change in the substance of what was taught, and few improvements in teaching methods during the previous half century.

In 1989 the chief executives of the eight largest public accounting firms published a “White Paper” of their concerns regarding the quality and number of accounting graduates available to the public accounting profession. The group contributed \$4 million to support the development of stimulating and relevant curricula. The Accounting Education Change Commission (AECC) was formed to identify and recommend needed improvements in accounting education. The commission included accounting faculty and members representing the AICPA, the Financial Executives Institute, the National Association of Accountants, the American Assembly of Collegiate Schools of Business, the National Association of State Boards of Accountancy, and the sponsoring firms. During the following six years the AECC published two position statements and six issue statements on accounting education based upon information obtained in their research. (Position and Issues Statements, 1996)

Position statement number one (1990) identified the desired capabilities of graduate accounting students. The capabilities included the skills, knowledge, professional orientation, general education, general business education, general accounting education, and specialized accounting education.

Skills were identified as intellectual skills, interpersonal skills and communication skills. The following intellectual skills were identified: (1) the capacity for inquiry, (2) abstract logical thinking, (3) inductive and deductive thinking, and (4) critical analysis

thinking. These intellectual skills have recently received much interest in cognitive process science. (Bransford, Sherwood, Vye, & Rieser, 1986, Gholamali, & Graham, 1994, Nasca, 1994) New research concerning how the brain functions has encouraged researchers to develop new theories to explain their findings. Gardner (1993) has proposed a multiple intelligence theory that includes verbal, logical, intrapersonal, interpersonal, visual, musical and kinesthetic intelligence. Gardner defines intelligence as a skill desired by a culture, with the skill often related to an individual's profession.

Sternberg (1990), although not concurring with Gardner, has developed the triarchic theory of intelligence. The theory builds on intelligence as an indicator of what an individual can do, but also how a person prefers to do a task. The triarchic theory of mental self-government is derived from the theories of cognitive and personality styles.

Research by Grigorenko and Sternberg (1997) has provided evidence that thinking styles are reflected in styles of learning, teaching, and working. As discussed by Sternberg and Grigeorenko (1997), if an individual's thinking style is a match to the required thinking style of a task in education or career, there is a strong correlation with success.

#### Statement of the Problem

A lack of research exists concerning thinking styles used by accounting students, and how thinking styles impact students' success in learning and career. The problem of this descriptive study was to identify and examine thinking styles used by introductory accounting course students and accounting major students at a major university, and a community college in the Pacific Northwest. The following research questions were identified:

1. Do differences exist in thinking styles among accounting students of different ages?

2. Do the thinking styles of accounting majors and other majors differ?
3. Do differences in students' thinking styles exist in accounting majors at different stages of accounting study?
4. Do differences in accounting students' thinking styles exist between two and four year institutions?
5. Do differences in accounting students' thinking styles exist between gender?

#### Null Hypotheses

- H<sub>0</sub>-1. No difference exists in thinking scale  $i$  among students of different ages taking accounting courses ( $i = 1, \dots, 13$ ).
- H<sub>0</sub>-2. No difference exists in thinking scale  $i$  between different majors ( $i = 1, \dots, 13$ ).
- H<sub>0</sub>-3. No difference exists in thinking scale  $i$  between accounting major students at different stages of accounting study ( $i = 1, \dots, 13$ ).
- H<sub>0</sub>-4. No difference exists in thinking scale  $i$  between two and four year institution students ( $i = 1, \dots, 13$ ).
- H<sub>0</sub>-5. No difference exists in thinking scale  $i$  between gender of accounting students ( $i = 1, \dots, 13$ ).

#### Assumptions

1. The student's response to inventory questions were accurate and honest.
2. Participants read and understood English.
3. Participants understood instructions.

#### Delimitations

1. The study was delimited to subjects at a 4-year institution and a 2-year institution in the Pacific Northwest.



2. The study was delimited to introductory accounting students and accounting major students.
3. Participation was delimited to accounting students in attendance on the day the thinking style inventory was administered.

#### Limitations

The following limitations were identified:

1. The Sternberg-Wagner Thinking Style Inventory is a self-reporting instrument, and therefore reflects the students' perception.
2. Participation of the accounting students was voluntary.

#### Definition of Terms

1. Cognitive Ability: Any ability that concerns some class of cognitive tasks. (Carroll, 1993, p.10)
2. Cognitive Task: The processing of mental information. (Carroll, 1993, p. 10)
3. Cognitive Process: Any action or series of actions in which mental contents are operated on to produce some result. (Carroll, 1993, p. 10)
4. Cognitive Styles: Characteristic, self-consistent modes of functioning which individuals show in their perceptual and intellectual activities. (Sternberg, 1997, p. 295)
5. Intelligence: The mental abilities necessary for adaptation to, as well as shaping and selection of, any environmental context. (Sternberg, 1997, p. 1030)
6. Thinking Styles: Modes of thought that individuals find comfortable and suitable for themselves. (Sternberg, 1993, p. 122)

#### Significance of the Study

Accounting education has been researched in terms of students' problem solving

techniques and personality characteristics. A lack of research exists concerning thinking styles used by accounting students, and how thinking styles impact students' success in learning and career. The area of interest for this study is the stylistic aspect of cognitive abilities. A widely accepted concept in educational psychology is that a student's cognitive abilities are a significant predictor of success in school. ( Sternberg, 1997 )

However, there is an unexplained variance in the theory of abilities, and recent theories of cognitive styles have been proposed to account for some of the variance. (Sternberg, 1997) The use of Sternberg's thinking styles may provide academia with useful information about the development of intellectual skills needed by accounting students. Academia may also find suggestions for more effective methods of instruction and assessment by utilizing strategies that match some of the students' styles of thinking.

As shown in table 1 and 2, Sternberg offers the following suggestions for a match between methods, assessments, and thinking styles.

Table 1

## Thinking Styles and Methods of Instruction

<u>Methods of Instruction</u>	<u>Most Compatible Thinking Style(s)</u>
Lecture	Executive, Hierarchical
Thought-based questioning	Judicial, Legislative
Cooperative (group) learning	External
Problem solving of given problems	Executive
Projects	Legislative
Small group recitation	External, Executive
Small group discussion	External, Judicial
Reading	Internal, Hierarchical
For details	Local, Executive
For main ideas	Global, Executive
For Analysis	Judicial
Memorization	Executive, Local, Conservative

Table 2

## Thinking Styles and Methods of Assessment

<u>Method of Assessment</u>	<u>Main Skills Tapped</u>	<u>Most Compatible Style(s)</u>
Short-answer and multiple-choice tests	Memory Analysis Time allocation Working by self	Executive, Local Judicial, Local Hierarchical Internal
Essay Tests	Memory Macro analysis Micro analysis Creativity Organization Time allocation Acceptance of teacher viewpoint Working by self	Executive, Local Judicial, Global Judicial, Local Legislative Hierarchical Hierarchical Conservative Internal
Projects and portfolios	Analysis Creativity Teamwork Working by self Organization High commitment	Judicial Legislative External Internal Hierarchical Monarchic
Interview	Social ease	External

## CHAPTER TWO

### Review of the Literature

#### Introduction

The problem of this descriptive study was to identify and examine the thinking styles used by introductory accounting course students and accounting major students at a major universities, and a community college in the Pacific Northwest. The focus of the study was on the assessment of student thinking styles, as they relate to intellectual skills identified by the Accounting Education Change Commission as needed by accounting students in chapter one, which may help identify effective methods of instruction and assessment.

During the past three decades neuroscientists have made major breakthroughs in their understanding of normal as well as abnormal brain processes. Neuroscience is the term used to describe a large array of studies now underway to discover how the brain functions. The slow but steady investigation into how the brain works is yielding a large number of new cognitive theories. (Ausubel, 1968, Carroll, 1993, Feuerstein, 1980, Gardner, 1993, Sternberg, 1990) In contrast to behavioral theorists, who conduct research and develop theories concerning stimuli and response in learning, (Sims & Sims, 1995) cognitive theorists are concerned with how individuals process stimuli. Information processing is, therefore, the focus of many current cognitive theories (Presseisen, Sternberg, Fischer, Knight, & Feuerstein, 1990) and the interest is upon how individuals perceive, interpret, and mentally store the information from stimuli in the learning process.

Presseisen (et al. 1990, p. 7) raises interesting questions concerning the school reform movement and cognitive theories. "What is schooling for? How do students learn? What is intelligence? What makes students intelligent? Can students' abilities be changed? What

are the important roles for teachers and educators in an effective school?" Some cognitive theorist believe the driving force in the current paradigm shift is due to new theories of human development and learning.

### Cognitive Abilities

There is no single theory of cognitive abilities. Buss (1995, p. 1) describes the current environment as "...currently in conceptual disarray, characterized by unconnected mini-theories and isolated empirical findings." Carroll, (1993) in one of the most comprehensive collections of cognitive theories, critiqued the results of factor-analysis literature on cognitive abilities. The findings of this study indicated that measurements of abilities are for a fixed point in time, and most theories do not suggest that ability is stable over time. In addition, Carroll found little evidence that the major cognitive abilities of reasoning and problem solving were different across gender, culture, or racial groups. Differences observed were attributed to levels of education, and the different socialization of sexes, cultural and racial variables.

Carroll (1993, p. 16) also noted there were some indications that some level of cognitive ability may be genetically predisposed, and these cognitive abilities "...are at least relatively stable and relatively resistant to attempts to change them though education or training, and at the same time are possibly predictors of future success." However, Carroll (p. 686) states " No simple answers can be given to the question of whether cognitive abilities are malleable or improvable through specific types of experiences and interventions. Undoubtedly some abilities are more malleable than others." The malleability of cognitive abilities was supported by Ausubel's (1969, p. 147) statement "...the transferability of a given body of knowledge can be most effectively exercised by attempting to influence the

crucial variables of cognitive structure.” Feuerstein’s research (1982) indicated that cognitive structure can be changed by proper intervention techniques.

Ausubel (1968, p. 12) was concerned not only with the cognitive learning processes, but also aspects of relationship between teaching and learning. He stated “...teaching itself is effective only to the extent that it manipulates effectively those psychological variables that govern learning.” The psychological variables were identified as intrapersonal (factors within the learner) and situational (factors in the learning situation) categories. Ausubel (1968, p. 128) hypothesized that learning was dependent upon the previous development of cognitive structure (intrapersonal) and cognitive structure was influenced by “...methods of presenting, arranging, and ordering learning materials and practice trials” (factors in the learning situation). The intrapersonal and factors in the learning situation are also supported by Feuerstein’s (1980) theory of cognitive modifiability.

Feuerstein’s (1980) theory for cognitive modifiability does not assume a static cognitive structure. Feuerstein supports the theory that intelligence is an open, dynamic system that is modifiable at any age and ability level. Feuerstein (1982, p. 1) developed the Instrumental Enrichment program in an effort to “...change the overall cognitive structure by transforming a passive and dependent cognitive style into that characteristic of an autonomous and independent thinker.” The change in cognitive structure, brought about by the Instrumental Enrichment intervention, emphasizes teaching students thinking and problem solving skills based upon the students metacognitive or executive processes (cognitive abilities). The results of Feuerstein’s research indicated that changes effected continued after intervention, indicating a permanent positive improvement in cognitive abilities.

In support of Feuerstein's theory, Gardner (1993) has developed the theory of multiple intelligence. Gardner's theory is based upon the premises that a wide range of intelligence exists rather than a single intelligence. Gardner (1993, p.7) defines intelligence "...as the ability to solve problems, or to fashion products, that are valued in one or more culture or community settings."

Intelligence, as conceived by Gardner's theory, would therefore be recognized differently by different societies and cultures, and would be manifested by skills and abilities desired or needed by that society or culture. Gardner has identified six intelligences that are recognized across cultures: musical, bodily-kinesthetic, logical-mathematical, spatial, interpersonal, and intrapersonal.

Individuals possess in varying degrees all of these types of intelligences. Gardner has conducted educational research that supports the theory that if teaching and assessing students are based upon the individual's intelligence strengths, the learning process is enhanced. Multiple intelligence also supports the theory that intelligence (cognitive abilities) can be modified by training.

Ausubel's concern with the students' learning processes and the relationship between teaching and learning, and Feuerstein's emphasis on metacognitive or executive processes are congruent with the theories of cognitive styles. The theories of cognitive styles (Grigorenko & Sternberg, 1997) do not attempt to measure abilities, but focus on how individuals prefer to use their abilities.

### Cognitive Styles

Cognitive styles theories have been developed in three broad areas. (Sternberg, 1997) The first area is cognition-centered and seeks to explain modes of functioning that



individuals use in their perceptual and intellectual activities. A second area of development is personality-centered and suggests ways an individual gathers information, makes decisions, and interacts with the external environment. The cognition and personality styles are proposed as consistent modes used by the individual and can not be readily modified by training. The styles are thus viewed as structures that are stable over time.

The third broad area of theory that has been proposed is activity-centered. The activity centered approach focuses on learning styles. Learning styles are defined as processes that can be enhanced by training or education. Learning processes are not viewed as structures that are stable over time. The activity-centered theories are of special interest to educators as styles that are activity-centered are viewed as processes which can be used by students to enhance the learning processes. The objective of using activity-center styles is to help the student develop styles that are appropriate for different situations.

#### Learning styles.

Learning styles are defined by Baker, Simon & Bazeli (1986, p. 1) as “A person’s learning style is part of that individual’s cognitive structure and refers to the characteristic style of acquiring and using information in learning and/or solving problems.” Numerous research studies have been conducted on the learning styles of accounting students and professional accountants. (Baldwin & Reckers, 1984, Baker, Simon & Bazeli, 1986, Baker, Simon & Bazeli, 1987, Brown & Burke, 1987) Using the Learning Styles Inventory developed by Kolb, the findings of the above research were similar in identifying accounting students as tending to use a convergent cognitive style of learning and problem solving. Convergents are identified by Baldwin & Reckers (1984, p.66) as individuals who are practical in the application of ideas, and “ This person seems to do best in situations where

there is a single correct answer or solution to a question or problem. Their knowledge is organized in such a way that, through hypothetical-deductive reasoning they can focus it on specific problems. Convergents are often relatively unemotional, prefer to deal with things rather than people and tend to have narrow technical interests.”

The above findings would emphasize a need for inductive thinking, and a more global thinking style according to the AECC recommendations identified in chapter 1. But this represents only one mini-theory in cognitive abilities according to Buss (1995).

#### Personality styles.

In research conducted by Geary & Rooney (1993), Ott, Mann & Moores (1990), and Schloemer and Schloemer (1997), the personality styles of accounting students and accounting professionals were examined. Geary and Rooney (1993, p. 60) used the Myers-Briggs Type Indicator (MBTI) to evaluate accounting students' preference for sensate thinking or intuitive thinking. The MBTI assessment is based upon Carl Jung's theory and sensate thinking is described as activities that are "...highly structured problem solving" and "...emphasizes facts, patterns, rules, and procedures; while intuitive thinking is focused on new possibilities and unstructured problems." Geary and Rooney (1993) found that accounting students indicated a preference for sensate thinking activities.

Schloemer and Schloemer (1997) also used the MBTI assessment to compare research of personality types of professional accountants prior to 1989, with the personality types of professionals who had become partners after 1989. They found little difference in their study and earlier studies. Accountants show a strong preference for either the ESTJ or ISTJ styles. The STJ styles refer to using sensing, thinking and judgement to obtain information, solve problems and make decisions (Myers, 1987, p. 5) The E refers to

extroversion, and “people who prefer extraversion tend to focus on the outer world of people and the external environment. Extraverts usually prefer to communicate more by talking than by writing. They need to experience the world in order to understand it and thus tend to like action. The I refers to introversion and people who prefer introversion focus more on their own inner world. Introverts tend to be more interested and comfortable when their work requires a good deal of their activity to take place quietly inside their heads. They like to understand the world before experiencing it, and so often think about what they are doing before acting.” The conclusion of Schloemer and Schloemer indicated that although the accounting profession has changed, the personality types of individuals in the profession remain virtually unchanged.

#### Thinking styles.

Thinking styles are a part of Sternberg’s theory of mental self-government (Grigorenko & Sternberg, 1997, p. 296). “The theory addresses the question of how people govern and manage their everyday cognitive activities, within the school and without. In the theory of mental self-government, a style of thinking is defined as a preferred way of thinking. It is not an ability, but rather a favored way of expressing or using one or more abilities.”

The theory of mental self-government was developed based upon early theories of cognitive styles. Sternberg (Grigorenko & Sternberg, 1997, p. 296) suggests that thinking style “...addresses all three domains- the domain of cognition, the domain of personality, and the domain of activity.” Sternberg also proposes that thinking styles are not fixed and can vary over time, are in part socialized, and are modifiable.

Research conducted by Sternberg in 1993 involved 199 gifted high school students in

a 4-week, college-level psychology course. Four raters were used to score the assessments and assignments of the students. Students' thinking styles were evaluated using the 104 items of the 13 sub-scales of the Sternberg-Wagner Thinking Styles Questionnaire.

The problem of the study was to determine whether styles made a difference in academic performance depending upon the match between type of instruction and the student's thinking style. Five of the thinking styles contributed significantly to predictions of academic performance, and there were significant differences in assessment scores for six of the thinking styles that were matched to assessment instruments.

Research on thinking styles has been conducted by Huang & Burton (1994), Junghee & Michael (1995), Zhang & Sachs (1997), and Sternberg (1993). The research supports the theory that if teaching and assessment are matched to a student's thinking styles the learning process is enhanced.

### Summary

A description of some of the cognitive abilities and cognitive styles research and theories were described in this chapter. The connection between abilities, styles, teaching and assessment, and enhanced student learning were introduced.

## CHAPTER THREE

### Methodology

#### Introduction

The problem of this descriptive study was to identify and examine thinking styles used by introductory accounting course students and accounting major students at a major university, and a community college in the Pacific Northwest using the Sternberg-Wagner Thinking Styles Inventory. The specific student thinking styles selected for examination were the 13 styles of thinking sub-scales comprising the Sternberg-Wagner Thinking Styles Inventory. The following research questions were identified:

1. Do differences exist in thinking styles among accounting students of different ages?
2. Do the thinking styles of accounting majors and other majors differ?
3. Do differences in students' thinking styles exist in accounting majors at different stages of accounting study?
4. Do differences in accounting students' thinking styles exist between two and four year institutions?
5. Do differences in accounting students' thinking styles exist between gender?

#### Hypotheses

The following hypotheses listed below were developed for research questions.

H<sub>0</sub>-1. No difference exists in thinking scale  $i$  among students of different ages taking accounting courses ( $i = 1, \dots, 13$ ).

H<sub>0</sub>-2. No difference exists in thinking scale  $i$  between different majors ( $i = 1, \dots, 13$ ).

H<sub>0</sub>-3. No difference exists in thinking scale  $i$  between accounting major students at different stages of accounting study ( $i = 1, \dots, 13$ ).

$H_0-4$ . No difference exists in thinking scale  $i$  between two and four year institution students ( $i = 1, \dots, 13$ ).

$H_0-5$ . No difference exists in thinking scale  $i$  between gender of accounting students ( $i = 1, \dots, 13$ ).

This chapter provides detail information of subjects, variables, design and analysis. and instrument.

### The Sample

The subjects of this study were drawn from the accounting classes of a public community college and the accounting classes of a public university in the Pacific Northwest. Students did not receive advance notice about the study. On the chosen day of the assessment, instructors ask students in attendance to participate in the study. The instructor verbally informed students that their participation was voluntary and would not affect their grade. Subject variables included: (1) school attended, major field of study, gender, age, and educational class status.

### Instrumentation

#### Sternberg-Wagner Thinking Styles Inventory.

The Sternberg-Wagner Thinking Styles Inventory was developed in 1991 and underlies Sternberg's theory of Mental Self-Government. The inventory has 13 sub-scales, with eight statements on each subscale. The subjects are asked to rate themselves for each statement on a 7 point Likert scale, with 1 indicating the statement did not fit the way they typically do things, and 7 indicating that the statement characterized them extremely well.

Sternberg and Wagner established norms for the inventory with college students (1992) and the reliability (Coefficient Alpha) for internal consistencies ranged from .42

(Monarchic) to .88 (External). Correlation Coefficients of sub-scale scores were determined with the Myers-Briggs Type Indicator, and the Gregoric Style Delineator. The construct validity indicated the inventory was reliable and valid for the study of thinking styles.

Thinking styles sub-scales.

Table 3

Functions

<u>Legislative:</u>	<u>Predilection</u>
i = 1	Likes tasks, projects, and situations that require creation, formulation, and planning of ideas, strategies, and products.
<u>Executive:</u>	
i = 2	Likes tasks, projects, and situations that provide structure, procedures, or rules to work with, and, that although modifiable can serve as guidelines to measure progress.
<u>Judicial:</u>	
i = 3	Likes tasks, projects, and situations that require evaluation, analysis, comparison-contrast, and judgment of existing ideas, strategies, and projects.

Table 4

## Levels

<u>Global:</u>	<u>Predilection</u>
i = 4	Likes tasks, projects, and situations that require engagement with large, global, abstract ideas.
<u>Local:</u>	
i = 5	Likes tasks, projects, and situations that require engagement with specific, concrete details.

Table 5

## Forms

<u>Hierarchic:</u>	<u>Predilection</u>
i = 6	Likes tasks, projects, and situations that allow creation of a hierarchy of goals to fulfill.
<u>Monarchic:</u>	
i = 7	Likes tasks, projects, and situations that allow focusing fully on one thing or aspect at a time and staying with that aspect until it is complete.
<u>Oligarchic:</u>	
i = 8	



Table 5 Continued

## Forms

Oligarchic Continued:

Likes tasks, projects, and situations that allow working with competing approaches, with multiple aspects or goals that are equally important.

Anarchic:

i = 9

Likes tasks, projects, and situations that lend themselves to great flexibility of approaches, to trying anything one wishes as one pleases.

Table 6

## Leanings

Liberal:Predilection

i = 10

Likes tasks, projects, and situations that involve unfamiliarity and ambiguity, and that also require going beyond existing rules and procedures and allow for maximization of change.

Conservative:

i = 11

Likes tasks, projects, and situations that require adherence to existing rules and procedures.

Table 7

## Scope

<u>Internal:</u>	<u>Predilection</u>
i = 12	Likes tasks, projects, and situations that require activities that allows one to work as a unit, independently from others.
<u>External:</u>	
i = 13	Likes tasks, projects, and situations that require activities that allow working with others in a group or interacting with others at different stages of progress.

Sampling Procedure

A convenient sample method was used to obtain a sample for the study. On the day selected for administering the instrument, all students attending accounting classes of participating instructors at the two colleges/universities were invited to participate in the study.

Data Collection Procedure

Subjects were administered the Sternberg Thinking Styles Inventory. The instructors of the class explained and administered the inventory.

Research Design

The design of this study was descriptive. There was no treatment in the design. An examination was conducted using the Thinking Styles Inventory to identify subjects' thinking styles.

### Independent and Dependent Variables

The type of student was the independent variable of this study. Thinking style was the dependent variable of this study. Categorical independent variables were two year/four year institution, gender, age, class standing, and major field of study.

### Statistical Analysis

The data were gathered using a seven point Likert scale in a self-reporting instrument with eight questions for each sub-scale. The scores were calculated by summing the scores for each sub-scale and dividing by eight to achieve an average score used in the analysis.

The data were analyzed using parametric and/or nonparametric tests which included descriptive statistics, stem and leaf plots, one-way analysis of variance, Wilcoxon and Van der Waerden procedures. The probability level used was .05. Post hoc analyses using Fisher's LSD for paired comparisons of means was conducted when significant differences were identified between groups using an alpha level of .05.

### Summary

Chapter III presented information about the research methodology used in the study. Descriptions of the sample, the research instrument, and the statistical procedures used in the data analysis phase of the study were presented.

Chapter IV presents the research findings. A summary of the study, the study conclusions and recommendations are presented in the concluding chapter.

## CHAPTER IV

### Findings

#### Introduction

The problem of this descriptive study was to identify and examine thinking styles used by introductory accounting course students and accounting major students at a major university, and a community college in the Pacific Northwest. The robustness of the parametric tests when questions of normality, variances, and sample sizes arise is well known. The sample sizes were of concern for this analysis, and the results were compared to the Van der Waerden nonparametric statistical tests. The findings were similar, and therefore, the parametric results were used.

The specific thinking styles selected for examination were the 13 sub-scales of the Sternberg-Wagner Thinking Styles Questionnaire. Mean scores of students for each sub-scale are listed in the tables below:

Table 8

#### Legislative

	N	(Mean)	Standard Deviation
All	235	4.977	.942
Age (18-19)	74	5.014	.960
Age (20)	54	5.143	1.005
Age (21-22)	47	4.883	.857
Age (23 +)	60	4.855	.942
Accounting Majors	63	4.837	.905
Other Majors	172	5.028	.953
Lower Division Accounting	34	4.815	.793
Upper Division Accounting	29	4.862	1.036
Four Year Institution	201	4.967	.953
Two Year Institution	34	5.032	.888
Female	114	4.992	.967
Male	121	4.962	.923

Table 9

Executive

	(N)	Mean	Standard Deviation
All	235	4.848	.942
Age (18-19)	74	4.928	.952
Age (20)	54	4.741	.982
Age (21-22)	47	4.883	1.002
Age (23 +)	60	4.817	1.151
Accounting Majors	63	4.992	1.061
Other Majors	172	4.820	1.005
Lower Division Accounting	34	4.803	1.163
Upper Division Accounting	29	5.062	.928
Four Year Institution	201	4.854	1.018
Two Year Institution	34	4.812	1.036
Female	114	4.999	.979
Male	121	4.705	1.038

Table 10

Judicial

	(N)	Mean	Standard Deviation
All	235	4.269	1.001
Age (18-19)	74	4.074	1.099
Age (20)	54	4.494	1.004
Age (21-22)	47	4.260	.953
Age (23+)	60	4.313	.877
Accounting Majors	63	4.006	.958
Other Majors	172	4.365	1.002
Lower Division Accounting	34	4.003	.844
Upper Division Accounting	29	4.010	1.092
Four Year Institution	201	4.428	2.304
Two Year Institution	34	4.812	1.036
Female	114	4.326	2.951
Male	121	4.463	.936

Table 11

Global

	(N)	Mean	Standard Deviation
All	235	4.021	1.015
Age (18-19)	74	3.989	.913
Age (20)	54	4.144	1.090
Age (21-22)	47	4.262	.977
Age (23 +)	60	3.760	1.015
Accounting Majors	63	3.776	.897
Other Majors	172	4.110	1.043
Lower Division Accounting	34	3.709	.738
Upper Division Accounting	29	3.855	1.061
Four Year Institution	201	4.050	1.020
Two Year Institution	34	3.850	.983
Female	114	3.695	.953
Male.	121	4.328	.979

Table 12

Local

	(N)	Mean	Standard Deviation
All	235	4.230	.878
Age (18-19)	74	4.270	.905
Age (20)	54	4.274	.907
Age (21-22)	47	4.172	.863
Age (23+)	60	4.185	.847
Accounting Majors	63	4.235	.868
Other Majors	172	4.228	.885
Lower Division Accounting	34	4.094	.779
Upper Division Accounting	29	4.400	.949
Four Year Institution	201	4.212	.875
Two Year Institution	34	4.335	.903
Female	114	4.220	.889
Male	121	4.239	.872

Table 13

Hierarchic

	(N)	Mean	Standard Deviation
All	235	5.082	.927
Age (18-19)	74	5.069	.950
Age (20)	54	4.978	.943
Age (21-22)	47	4.994	.788
Age (23+)	60	5.262	.979
Accounting Majors	63	5.013	.875
Other Majors	172	5.108	.946
Lower Division Accounting	34	4.976	.841
Upper Division Accounting	29	5.055	.926
Four Year Institution	201	5.040	.909
Two Year Institution	34	5.332	1.007
Female	114	5.300	.914
Male.	121	4.877	.895

Table 14

Monarchic

	(N)	Mean	Standard Deviation
All	235	4.042	.931
Age (18-19)	74	4.189	.828
Age (20)	54	4.259	.982
Age (21-22)	47	3.883	.888
Age (23 +)	60	3.790	.977
Accounting Majors	63	3.867	1.001
Other Majors	172	4.106	.899
Lower Division Accounting	34	3.559	.917
Upper Division Accounting	29	4.228	.989
Four Year Institution	201	4.044	.929
Two Year Institution	34	4.029	.958
Female	114	3.896	.986
Male	121	4.180	.859

Table 15

Oligarchic

	(N)	Mean	Standard Deviation
All	235	3.826	.934
Age (18-19)	74	3.828	.874
Age (20)	54	4.083	.931
Age (21-22)	47	3.762	.903
Age (23 +)	60	3.640	1.000
Accounting Majors	63	3.598	.947
Other Majors	172	3.909	.918
Lower Division Accounting	34	3.453	.789
Upper Division Accounting	29	3.769	1.094
Four Year Institution	201	3.858	.944
Two Year Institution	34	3.632	.861
Female	114	3.651	.924
Male	121	3.990	.917

Table 16

Anarchic

	(N)	Mean	Standard Deviation
All	235	4.203	.867
Age (18-19)	74	4.165	.792
Age (20)	54	4.367	.853
Age (21-22)	47	4.255	.848
Age (23 +)	60	4.060	.969
Accounting Majors	63	3.919	.923
Other Majors	172	4.306	.824
Lower Division Accounting	34	3.824	.846
Upper Division Accounting	29	4.031	1.010
Four Year Institution	201	4.180	.867
Two Year Institution	34	4.338	.866
Female	114	4.143	.908
Male	121	4.259	.825



Table 17

Liberal

	(N)	Mean	Standard Deviation
All	235	4.558	1.079
Age (18-19)	74	4.482	1.102
Age (20)	54	4.535	1.025
Age (21-22)	47	4.428	.871
Age (23 +)	60	4.773	1.230
Accounting Majors	63	4.175	1.169
Other Majors	172	4.698	1.012
Lower Division Accounting	34	4.379	1.110
Upper Division Accounting	29	3.934	1.210
Four Year Institution	201	4.560	1.070
Two Year Institution	34	4.544	1.146
Female	114	4.409	1.075
Male	121	4.698	1.068

Table 18

Conservative

	(N)	Mean	Standard Deviation
All	235	4.426	1.012
Age (18-19)	74	4.469	.939
Age (20)	54	4.552	.924
Age (21-22)	47	4.511	.984
Age (23 +)	60	4.193	1.171
Accounting Majors	63	4.456	1.233
Other Majors	172	4.415	.922
Lower Division Accounting	34	4.347	1.248
Upper Division Accounting	29	4.583	1.224
Four Year Institution	201	4.464	.976
Two Year Institution	34	4.203	1.197
Female	114	4.463	1.067
Male	121	4.391	.961

Table 19

Internal

	(N)	Mean	Standard Deviation
All	235	4.174	1.252
Age (18-19)	74	4.288	1.269
Age (20)	54	4.352	1.289
Age (21-22)	47	4.104	1.181
Age (23 +)	60	3.927	1.239
Accounting Majors	63	4.181	1.202
Other Majors	172	4.171	1.274
Lower Division Accounting	34	3.876	1.017
Upper Division Accounting	29	4.538	1.317
Four Year Institution	201	4.171	1.233
Two Year Institution	34	4.188	1.382
Female	114	3.919	1.326
Male	121	4.413	1.132

Table 20

External

	(N)	Mean	Standard Deviation
All	235	4.663	1.129
Age (18-19)	74	4.630	1.139
Age (20)	54	4.693	1.218
Age (21-22)	47	4.606	1.060
Age (23 +)	60	4.720	1.111
Accounting Majors	63	4.398	1.140
Other Majors	172	4.759	1.113
Lower Division Accounting	34	4.459	1.045
Upper Division Accounting	29	4.328	1.257
Four Year Institution	201	4.693	1.140
Two Year Institution	34	4.482	1.062
Female	114	4.753	1.282
Male	121	4.578	.961

Organization of the Chapter

Each research question and related hypothesis is restated followed by the research findings.

### Research Question One

The focus of the first research question was to identify and examine any significant difference of thinking styles used by accounting students of different ages.

1. Do differences exist in thinking styles among accounting students of different ages?

The following null hypothesis was used:

$H_0-1$  No difference exists in thinking scale  $i$  among students of different ages taking accounting courses ( $i = 1, \dots, 13$ ).

### Findings

Table 21 presents analysis of variance (ANOVAs) for each of the 13 sub-scales. Students were assigned to the following groups. Group one ( $N=74$ ) included 18 and 19 year old students. Group two ( $N=54$ ) was composed of students who were 20 years old. Group three ( $N=47$ ) included 21 and 22 year old students. Group four ( $N=60$ ) included all students age 23 and over. Table 22 presents the post hoc tests using Fisher's Least-Significant Difference Test for paired comparisons of means between groups using an alpha level of .05.

The sub-scale of Monarchic (form of thinking) produced a significant difference among groups. The post hoc test revealed a significant difference between 18-19 year old students (mean 4.189) and 23 and older students who were less monarchic (mean 3.790). Group two (age 20) with a mean of 4.259 was significantly different, more monarchal, than the 21-22 year old students (mean 3.883) and the 23 and older students (mean 3.790).

The sub-scale of Global (level of thinking) was marginally significant. The post hoc test identified a significant difference in means between the 20 year olds (mean 4.144) and oldest students (23+) who were less global (mean 3.760). There was also a significant difference in means between 21-22 year old students who were more global (mean 4.262)

than the older students of 23+ (mean 3.760).

The sub-scale of Oligarchic (form of thinking) was non-significant at the .081 level. No post hoc tests were performed. This scale requires further study.

$H_0-1$  (null form) of no difference exists in thinking scale  $i$  among students of different ages taking accounting courses was rejected for scale 4 (Global), and 7 (Monarchic).

### Research Question Two

The focus of research question two was to identify and examine any significant differences of thinking styles used by accounting majors and other majors in accounting courses.

2. Do the thinking styles of accounting majors and other majors differ?

The following null hypothesis was used:

$H_0-2$ . No difference exists in thinking scale  $i$  between different majors ( $i = 1, \dots, 13$ ).

### Findings

Table 23 presents ANOVAs for each of the 13 sub-scales. Students were assigned to the following groups. Group one (N=63) was identified as accounting majors. Group two (N=172) was composed of all other majors.

There was a significant difference between groups for the Judicial (function of thinking) sub-scale. Accounting majors with a mean of 4.006 were less judicial than other majors with a mean of 4.365. The sub-scale of Monarchic (form of thinking) was borderline significant between groups. Accounting majors with a mean of 3.867 were less monarchic than other majors with a mean of 4.106.

Table 21

One Way ANOVA Thinking Styles/Ages 1 (N=74) 2 (N=54) 3 (N=47) 4 (N=60)

		Sum of Squares	df	Mean Square	F	Sig.
Legislative	Between Groups	2.888	3	.963	1.085	.356
	Within Groups	204.933	231	.887		
	Total	207.821	234			
Executive	Between Groups	1.216	3	.405	.387	.762
	Within Groups	241.590	231	1.046		
	Total	242.806	234			
Judicial	Between Groups	5.67	3	1.890	1.909	.129
	Within Groups	228.772	231	.990		
	Total	234.443	234			
Monarchic	Between Groups	9.151	3	3.050	3.635	.014
	Within Groups	193.862	231	.839		
	Total	203.013	234			
Hierarchic	Between Groups	2.903	3	.968	1.128	.338
	Within Groups	198.142	231	.858		
	Total	201.045	234			
Oligarchic	Between Groups	5.846	3	1.949	2.271	.081
	Within Groups	198.240	231	.858		
	Total	204.087	234			
Anarchic	Between Groups	2.910	3	.970	1.296	.276
	Within Groups	172.849	231	.748		
	Total	175.758	234			
Global	Between Groups	7.708	3	2.569	2.544	.057
	Within Groups	233.340	231	1.010		
	Total	241.048	234			
Local	Between Groups	.503	3	.168	.215	.886
	Within Groups	180.049	231	.779		
	Total	180.551	234			
Internal	Between Groups	6.566	3	2.189	1.403	.243
	Within Groups	360.330	231	1.560		
	Total	366.896	234			
External	Between Groups	.475	3	.158	.123	.947
	Within Groups	297.816	231	1.289		
	Total	298.290	234			
Liberal	Between Groups	4.031	3	1.344	1.156	.327
	Within Groups	268.482	231	1.162		
	Total	272.513	234			
Conservative	Between Groups	4.576	3	1.525	1.498	.216
	Within Groups	235.155	231	1.018		
	Total	239.732	234			

Table 22

Post Hoc Test Thinking Styles/Ages 1 (N=74) 2 (N=54) 3 (N=47) 4 (N=60)

Dependent Variable	(I) Age	(J) Age	Mean	Std. Error	Sig.	95% Confidence Interval	
			Difference (I-J)			Lower Bound	Upper Bound
Monarchic	18-19	20	-.070	.164	.670	-.393	.253
		21-22	.306	.171	.074	-.030	.643
		23+	.399*	.159	.013	.085	.713
	20	18-19	.070	.164	.670	-.253	.393
		21-22	.376*	.183	.041	.016	.736
		23+	.469*	.172	.007	.131	.808
	21-22	18-19	-.306	.171	.074	-.643	.030
		20	-.376*	.183	.041	-.736	-.016
		23+	.092	.178	.603	-.259	.445
23+	18-19	-.399*	.159	.013	-.713	-.085	
	20	-.469*	.172	.007	-.808	-.131	
	21-22	-.092	.178	.603	-.445	.259	
Global	18-19	20	-.155	.180	.389	-.510	.199
		21-22	-.273	.187	.147	-.642	.096
		23+	.229	.175	.191	-.115	.573
	20	18-19	.155	.180	.389	-.199	.510
		21-22	-.117	.200	.559	-.512	.278
		23+	.384*	.189	.043	.013	.756
	21-22	18-19	.273	.187	.147	-.096	.642
		20	.117	.200	.559	-.278	.512
		23+	.502*	.196	.011	.116	.887
23+	18-19	-.229	.175	.191	-.573	.115	
	20	-.384*	.189	.043	-.756	-.013	
	21-22	-.502*	.196	.011	-.887	-.116	

The sub-scale of Oligarchic (form of thinking) produced a significant difference between groups. Accounting majors were less oligarchic with a mean of 3.598 than other majors (mean 3.909). The Anarchic sub-scale also produced a significant difference between groups. The mean for accounting majors was 3.919, and other majors were more anarchic with a mean of 4.306. The Global (level of thinking) was significantly different between groups. The accounting majors were less global with a mean of 3.776, than other majors

with a mean of 4.110.

The accounting majors with a mean of 4.398 for the External (scope of thinking) sub-scale were significantly different (less external) than other majors with a mean of 4.759. The sub-scale of Liberal (leaning of thinking) also produced a significant difference between groups. The accounting majors were less liberal with a mean of 4.175, than other majors with a mean of 4.698.

$H_0-2$  (null form) of no difference in thinking scale  $i$  between different majors was rejected for scale 2 (Executive), 4 (Global), 7 (Monarchic), 8 (Oligarchic), 9 (Anarchic), 10 (Liberal), and 13 (External).

### Research Question Three

The focus of research question three was to identify and examine any significant differences of thinking styles used by accounting majors at different stages of accounting study.

3. Do differences in students' thinking styles exist in accounting majors at different stages of accounting study?

The following hypothesis was used:

$H_0-3$ . No difference exists in thinking scale  $i$  between accounting major students at different stages of accounting study ( $i = 1, \dots, 13$ ).

### Findings

Table 24 presents ANOVAs for each of the 13 sub-scales. Students were assigned to the following groups. Group one ( $N=34$ ) was identified as accounting majors in the 200 level accounting classes. Group two ( $N=29$ ) was identified as accounting majors in the upper division classes which included 300, 400 and 500 level classes.

Table 23

One Way ANOVA Thinking Styles/Accounting Majors-Other Majors 1(N=63) 2(N=172)

		Sum of Squares	df	Mean Square	F	Sig.
Legislative	Between Groups	1.689	1	1.689	1.909	.168
	Within Groups	206.132	233	.885		
	Total	207.821	234			
Executive	Between Groups	.479	1	.479	.460	.498
	Within Groups	242.328	233	1.046		
	Total	242.806	234			
Judicial	Between Groups	5.935	1	5.935	6.052	.015
	Within Groups	228.508	233	.981		
	Total	234.443	234			
Monarchic	Between Groups	2.650	1	2.650	3.082	.080
	Within Groups	200.363	233	.860		
	Total	203.013	234			
Hierarchic	Between Groups	.415	1	.415	.482	.488
	Within Groups	200.630	233	.861		
	Total	201.045	234			
Oligarchic	Between Groups	4.440	1	4.440	5.182	.024
	Within Groups	199.647	233	.857		
	Total	204.087	234			
Anarchic	Between Groups	6.918	1	6.918	9.547	.002
	Within Groups	168.840	233	.725		
	Total	175.758	234			
Global	Between Groups	5.152	1	5.152	5.089	.025
	Within Groups	235.895	233	1.012		
	Total	241.048	234			
Local	Between Groups	2.268E-03	1	2.268E-03	.003	.957
	Within Groups	180.549	233	.775		
	Total	180.551	234			
Internal	Between Groups	4.632E-03	1	4.632E-03	.003	.957
	Within Groups	366.892	233	1.575		
	Total	366.896	234			
External	Between Groups	6.006	1	6.006	4.787	.030
	Within Groups	292.285	233	1.254		
	Total	298.290	234			
Liberal	Between Groups	12.644	1	12.644	11.337	.001
	Within Groups	259.869	233	1.115		
	Total	272.513	234			
Conservative	Between Groups	7.541E-02	1	7.541E-02	.073	.787
	Within Groups	239.656	233	1.029		
	Total	239.732	234			



There was a significant difference between groups for the Monarchic (form of thinking) sub-scale. The lower division group with a mean of 3.559 was less monarchic than the upper division group with a mean of 4.228.

There was a significant difference between groups for the Internal (scope of thinking) sub-scale. The lower division group with a mean of 3.876 was less internal than the upper division group with a mean of 4.538. The sub-scale for Liberal (leaning of thinking) tended toward significant differences between the groups. The lower division group with a mean of 4.379 was more liberal than the upper division group with a mean of 3.934.

$H_0-3$  (null form) of no difference exists in thinking scale  $i$  was accordingly rejected for scale 7 (Monarchic), 10 (Liberal), and 12 (Internal).

#### Research Question Four

The focus of research question four was to identify and examine any significant difference of thinking styles used by accounting students at two and four year institutions.

4. Do differences in accounting students' thinking styles exist between two and four year institutions?

The following hypothesis was used:

$H_0-4$ . No difference exists in thinking scale  $i$  between two and four year institution students ( $i = 1, \dots, 13$ ).

#### Findings

Table 25 presents ANOVAs for each of the 13 sub-scales. Students were assigned to the following groups. Group one ( $N=201$ ) was identified as accounting students at the four year institution, and group two ( $N=34$ ) was identified as accounting students attending the two year institution.

Table 24

One Way ANOVA Thinking Styles/Accounting Majors Different Stages 1(N=34) 2(N=29)

		Sum of Squares	df	Mean Square	F	Sig.
Legislative	Between Groups	3.511E-02	1	3.511E-02	.042	.838
	Within Groups	50.791	61	.833		
	Total	50.826	62			
Executive	Between Groups	1.051	1	1.051	.933	.338
	Within Groups	68.698	61	1.126		
	Total	69.749	62			
Judicial	Between Groups	8.579E-04	1	8.579E-04	.001	.976
	Within Groups	56.857	61	.932		
	Total	56.857	62			
Monarchic	Between Groups	7.000	1	7.000	7.746	.007
	Within Groups	55.120	61	.904		
	Total	62.120	62			
Hierarchic	Between Groups	9.694E-02	1	9.694E-02	.125	.725
	Within Groups	47.393	61	.777		
	Total	47.490	62			
Oligarchic	Between Groups	1.563	1	1.563	1.764	.189
	Within Groups	54.067	61	.886		
	Total	55.630	62			
Anarchic	Between Groups	.674	1	.674	.788	.378
	Within Groups	52.163	61	.855		
	Total	52.837	62			
Global	Between Groups	.335	1	.335	.413	.523
	Within Groups	49.499	61	.811		
	Total	49.834	62			
Local	Between Groups	1.464	1	1.464	1.975	.165
	Within Groups	45.239	61	.742		
	Total	46.703	62			
Internal	Between Groups	6.848	1	6.848	5.050	.028
	Within Groups	82.709	61	1.356		
	Total	89.557	62			
External	Between Groups	.270	1	.270	.205	.652
	Within Groups	80.240	61	1.315		
	Total	80.510	62			
Liberal	Between Groups	3.098	1	3.098	2.314	.133
	Within Groups	81.661	61	1.339		
	Total	84.759	62			
Conservative	Between Groups	.869	1	.869	.568	.454
	Within Groups	93.326	61	1.530		
	Total	94.196	62			

No significant differences were found in twelve of the sub-scales. The sub-scale of Hierarchic approached significance. The accounting students of group one (four year institution) with a mean of 5.040 were less hierarchic than the students of group 2 with a mean of 5.332.  $H_0-4$  was not rejected.

#### Research Question Five

The focus of research question five was to identify and examine any significant differences of thinking styles used by accounting students of different gender.

5. Do differences in accounting students' thinking styles exist between gender?

The following hypothesis was used:

$H_0-5$ . No difference exists in thinking scale  $i$  between gender of accounting students ( $i = 1, \dots, 13$ )

#### Findings

Table 26 presents ANOVAs for each of the 13 sub-scales. Students were assigned to the following groups. Group one was identified as female accounting students ( $N=114$ ), and group two was identified as male accounting students ( $N=121$ ).

The sub-scale of Executive (function of thinking) produced a significant difference between groups. Group one (female) with a mean of 4.999 was more executive than group two with a mean of 4.705. The Monarchic (form of thinking) sub-scale also resulted in a significant difference between groups. Females were less monarchic with a mean of 3.896 than males with a mean of 4.180.

Males with a mean of 5.300 were significantly different on the Hierarchic sub-scale than females who were less hierarchic with a mean of 4.877. The sub-scale of Oligarchic also produced a significant difference between groups. Women with a mean of 3.651 were less

Table 25

One Way ANOVA Thinking Styles/ Two-Four Year Institutions 1 (N=201) 2 (N=34)

		Sum of Squares	df	Mean Square	F	Sig.
Legislative	Between Groups	.124	1	.124	.139	.710
	Within Groups	207.698	233	.891		
	Total	207.821	234			
Executive	Between Groups	5.122E-02	1	5.122E-02	.049	.825
	Within Groups	242.755	233	1.042		
	Total	242.806	234			
Judicial	Between Groups	1.402	1	1.402	.300	.584
	Within Groups	1089.076	233	4.674		
	Total	1090.477	234			
Monarchic	Between Groups	6.428E-03	1	6.428E-03	.007	.932
	Within Groups	203.007	233	.871		
	Total	203.013	234			
Hierarchic	Between Groups	2.489	1	2.489	2.921	.089
	Within Groups	198.556	233	.852		
	Total	201.045	234			
Oligarchic	Between Groups	1.483	1	1.483	1.706	.193
	Within Groups	202.603	233	.870		
	Total	204.087	234			
Anarchic	Between Groups	.732	1	.732	.974	.325
	Within Groups	175.027	233	.751		
	Total	175.758	234			
Global	Between Groups	1.160	1	1.160	1.127	.290
	Within Groups	239.887	233	1.030		
	Total	241.048	234			
Local	Between Groups	.442	1	.442	.572	.450
	Within Groups	180.109	233	.773		
	Total	180.551	234			
Internal	Between Groups	8.495E-03	1	8.495E-03	.005	.942
	Within Groups	366.888	233	1.575		
	Total	366.896	234			
External	Between Groups	1.291	1	1.291	1.013	.315
	Within Groups	297.000	233	1.275		
	Total	298.290	234			
Liberal	Between Groups	7.521E-03	1	7.521E-03	.006	.936
	Within Groups	272.505	233	1.170		
	Total	272.513	234			
Conservative	Between Groups	1.977	1	1.977	1.938	.165
	Within Groups	237.755	233	1.020		
	Total	239.732	234			

oligarchic than men with a mean of 3.990.

There was a significant difference between groups for the sub-scale of Global (level of thinking). Females with a mean of 3.6695 were less global than males with a mean of 4.328. There was also a significant difference between groups for the sub-scale of Internal (scope of thinking). Females with a mean of 3.919 were less internal than males with a mean of 4.413. The Liberal (leaning of thinking) sub-scale also produced a significant difference between groups. Females with a mean of 4.409 were less liberal than males with a mean of 4.698.

$H_0-5$  was rejected for scales 2 (Executive), 4 (Global), 6 (Hierarchic), 7 (Monarchic), 8 (Oligarchic), 10 (Liberal), and 12 (Internal).

#### Summary

The following five research questions were addressed in this study:

1. Do differences exist in thinking styles among accounting students of different ages?
2. Do the thinking styles of accounting majors and other majors differ?
3. Do differences in students' thinking styles exist in accounting majors at different stages of accounting study?
4. Do differences in accounting students' thinking styles exist between two and four year institutions?
5. Do differences in accounting students' thinking styles exist between gender?

An analysis of the data rejected some sub-scales of all hypotheses related to the above questions except hypothesis four. The data revealed numerous differences between sub-scale scores when students were compared by age, major, stage of accounting study, and gender.

Table 26

One Way ANOVA Thinking Styles/ Gender 1 (N=114) 2 (N=121)

		Sum of Squares	df	Mean Square	F	Sig.
Legislative	Between Groups	5.326E-02	1	5.326E-02	.060	.807
	Within Groups	207.768	233	.892		
	Total	207.821	234			
Executive	Between Groups	5.079	1	5.079	4.978	.027
	Within Groups	237.727	233	1.020		
	Total	242.806	234			
Judicial	Between Groups	1.094	1	1.094	.234	.629
	Within Groups	1089.384	233	4.675		
	Total	1090.477	234			
Monarchic	Between Groups	4.753	1	4.753	5.586	.019
	Within Groups	198.260	233	.851		
	Total	203.013	234			
Hierarchic	Between Groups	10.510	1	10.510	12.852	.000
	Within Groups	198.142	231	.858		
	Total	201.045	234			
Oligarchic	Between Groups	6.754	1	6.754	7.975	.005
	Within Groups	197.333	233	.847		
	Total	204.087	234			
Anarchic	Between Groups	.786	1	.786	1.046	.307
	Within Groups	174.973	233	.751		
	Total	175.758	234			
Global	Between Groups	23.547	1	23.547	25.224	.000
	Within Groups	217.501	233	.933		
	Total	241.048	234			
Local	Between Groups	2.045E-02	1	2.045E-02	.026	.871
	Within Groups	180.531	233	.775		
	Total	180.551	234			
Internal	Between Groups	14.320	1	14.320	9.463	.002
	Within Groups	352.576	233	1.513		
	Total	366.896	234			
External	Between Groups	1.797	1	1.797	1.412	.236
	Within Groups	296.494	233	1.273		
	Total	298.290	234			
Liberal	Between Groups	4.922	1	4.922	4.286	.040
	Within Groups	267.591	233	1.148		
	Total	272.513	234			
Conservative	Between Groups	.306	1	.306	.298	.586
	Within Groups	239.425	233	1.028		
	Total	239.732	234			

## CHAPTER V

### Summary, Conclusions, and Recommendations

#### Summary

Constituents, and members of the accounting profession, have identified the desired capabilities, technological, and intellectual skills needed by graduate accounting students to successfully perform the role of accountants in the 21<sup>st</sup> century. Among the concerns of the profession was the need for improvement in teaching methods, development of individual intellectual skills, interpersonal skills and communication skills.

Recent research and findings in the cognitive process science offer opportunities for the improvement in teaching methods and development of intellectual skills of accounting students. Cognitive research indicates that student's thinking styles can be used to enhance the teaching (learning) and assessment of students. Thinking styles that are a match to the required thinking styles of a task, have shown a strong correlation with success. Thinking styles are not fixed and are therefore modifiable.

The identification of student's thinking styles in accounting classes, using the Sternberg-Wagner Thinking Styles Inventory, was intended to gather information useful for efforts to improve accounting education, and possible future development of individual's intellectual skills necessary for success in the accounting profession.

#### Conclusions

The following conclusions are drawn from the findings of data gathered from students enrolled in accounting classes at a community college and a major university in the Pacific Northwest.

#### Functions/Age

Accounting students in age group one (18-19) were less judicial than older students. This could indicate that older students would be more successful with tasks, projects, and situations that are thought-based and require evaluation, analysis, comparison-contrast, and judgment of existing ideas, strategies, and projects.

#### Forms/Age

Younger students (18-20) were more monarchal than older students. The younger students could be more successful than older students with tasks, projects, and situations that allow them to focus fully on one thing or aspect at a time (their object of interest) and staying with that aspect until it is complete.

#### Levels/Age

The oldest group of students (23 or older) in the study was less global than younger students. The younger students could be more successful in tasks, projects, and situations that require engagement with large, global, abstract ideas.

Using Sternberg's theory of mental self-government that thinking styles are not fixed and can vary over time, are in part socialized, and are modifiable, the above findings could be a product of the socialization of higher education. Namely, critical thinking skills (Judicial) are required in many upper division classes. This may provide students with more opportunities to develop judicial thinking styles. In addition, the more experienced students may manage time and competing goals better than younger (monarchic) inexperienced students. Lastly, as students enter their senior year they are often working in their area of specialization that may require a local (specific concrete details) rather than a global perspective.

The above findings are similar to the findings of Baldwin and Reckers using the Kolb



Learning style instrument to determine learning styles of accounting students. As student groups progressed through their studies, they showed a trend of moving from Assimilators who have the ability to reflect on and observe experiences from many perspectives, to Convergers whose greatest strength is in the practical application of ideas. Convergers do best in situations where there is a single correct answer or solution to a question or problem.

#### Functions/Major

Students majoring in fields other than accounting tended to be more judicial than accounting majors. Judicial thinking has been identified as a necessary thinking style (page 3. critical analysis) that is required in the auditing function performed by accountants. Judicial thinking is also often required in selecting the proper generally accepted accounting principle to use in a given situation. This could indicate a need to help accounting students develop judicial thinking styles by utilizing teaching methods that use thought-based questioning, such as case studies and small group discussions.

#### Forms/Major

The analysis of Forms of thinking revealed accounting majors were less monarchic, oligarchic and anarchic than other majors. The accounting majors scored their highest mean in the Form of hierarchic. This would indicate these students like tasks, projects, and situations that allow creation of a hierarchy of goals to fulfill (order).

#### Levels/Major

Other majors were significantly more global in thinking than accounting majors. This may again be a part of the educational socialization where the accounting curriculum requires tasks, projects, and situations that require engagement with specific, concrete details (local).

Global Thinking style is required in some areas of accounting services. Teaching

methods that may help accounting students develop this style include reading assignments for main ideas, and assessment by essay for macro analysis which would include identifying the big picture, connectiveness or interactions.

#### Scope/Major

Accounting majors were significantly less external in thinking than other majors. This would suggest accounting students like tasks, projects, and situations that require activities that allows one to work as a unit, independently from others. Similar results were noted in the research of personality styles conducted with accounting students and accounting professionals using the Myers-Briggs Type Indicator.

#### Leanings/Major

Other majors were significantly more liberal in thinking style preference than accounting majors, and would prefer tasks, projects, and situations that involve unfamiliarity and ambiguity. This would also allow for going beyond existing rules and procedures and allow for maximization of change. Accounting education places heavy emphasis on adherence to existing rules and procedures, and may therefore provide accounting students with opportunities to develop a conservative style of thinking. On the other hand students may self-select into accounting because they believe it's "black and white" with low ambiguity because of the way beginning accounting classes are taught.

#### Forms/Stages

Accounting major students in upper division classes were significantly more monarchal than accounting major students in lower division classes. This is the opposite of forms/age results when all majors were the population of interest, and younger students were more monarchal than older students. This could be the result of the educational

socialization of introducing a specific topic in each chapter with lectures and homework assignments to reinforce that aspect of accounting (focus).

#### Scope/Stages

Accounting majors in the 200 level accounting classes were significantly less internal than more advanced accounting majors in 300, 400 and 500 level classes. The advanced students would prefer activities that allow working independently from others.

#### Leanings/Stages

Accounting majors in the lower division classes were also more liberal than accounting majors in upper division classes. The significant difference in the above three thinking styles could be a reflection of the weeding out process that occurs as younger students discover that a tentative field of interest is not working out and change their major to another field.

#### Two/Four Year Institutions

It is worthy of noting that no significant difference of thinking styles existed between accounting students at the two-year institution and the four-year university.

#### Functions/Gender

Females were more executive than males. Individuals who score high on the executive function may prefer tasks, projects, and situations that provide structure, procedures, or rules to work with. Sternberg suggest that methods of instruction might include lectures, reading for details, small group recitation, and problem solving of given problems.

#### Forms/Gender

Males were significantly more monarchic than females, and would like projects that

allow focusing fully on one thing at a time. Females were more hierarchic than males, and would prefer situations that allow creation of a hierarchy of goals to fulfill. Males also were more oligarchic than females, and could be more successful with projects that allow working with competing approaches and multiple goals that are equally important.

#### Levels/Gender

Males were significantly more global than females, and would tend to like projects that require engagement with large abstract ideas. Global thinking skills, as noted above, are required in many accounting tasks, and female students should be provided learning opportunities to develop the global thinking style.

#### Scope/Gender

Males were significantly more internal than females. This would indicate that males would like projects that allow working independently from others. As noted above, previous research using the Myers and Briggs personality assessment found similar results.

#### Leanings/Gender

Males were significantly more liberal than females. Males would like projects that involve unfamiliarity and ambiguity, and that require going beyond existing rules and procedures and allow opportunities for change. The accounting profession does encourage liberal thinking and recognizes the need for change in the profession.

The above significant difference in thinking styles between female and male accounting students could be accounted for by the difference in socialization of females and males in our society, i.e., aggressiveness, focus on winning or defeating, alternative courses of action if required, and independence.

The following conclusions were based on an analysis of the information obtained

from this study: Additional research by educators should be conducted using the Sternberg-Wagner Thinking Styles Questionnaire to determine students preferred thinking styles.

Additional experimental research by educators should then be conducted using teaching and assessment methods related to the identified thinking styles. Additional research should also be conducted to determine successful methods to employ in helping students develop thinking styles necessary for success in a given situation.

The dominant thinking styles used by the above accounting majors were as follows:

1. Functions: Executive--follow rules and procedures.
2. Levels: Local--engagement with specific, concrete details.
3. Forms: Hierarchic--establish a hierarchy of goals (order).
4. Leanings: Conservative--adherence to existing rules and procedures.
5. Scope: External-interacting with others

#### Recommendations

1. When teaching the above students in lower division classes, to enhance student learning, the instructor should use a variety of teaching and assessment methods because of the wide range of thinking styles used by students.
2. For upper division classes the instructor should consider not only the thinking styles used by students, but also the thinking styles required for success in the accounting profession.

**APPENDIX A**

**Sternberg-Wagner Thinking Styles Questionnaire**

## THINKING STYLES QUESTIONNAIRE

Your instructor is participating in a study of college/university teaching and learning. We request your participation in the study. Your participation is voluntary and not related to your grade for this class. Your responses will be confidential and only members of the research team will see your individual responses.

The attached questionnaire is about the different strategies and ways people use to solve problems, to carry out tasks or projects, and to make decisions. There are of course, no right or wrong answers. If you are willing to participate in this study, please provide the information requested below and return the completed questionnaire to your instructor.

School \_\_\_\_\_  
 Male \_\_\_\_\_ Female \_\_\_\_\_  
 Age \_\_\_\_\_  
 Major field of study \_\_\_\_\_  
 Freshman \_\_\_\_ Sophomore \_\_\_\_ Junior \_\_\_\_ Senior \_\_\_\_ Graduate \_\_\_\_  
 Course title \_\_\_\_\_

Read each statement carefully and decide how well it describes you. Use the scale provided to indicate how well the statement fits the way you typically do things at school, at home, or on a job. Circle 1 if the statement does not fit you at all, that is, you almost never do things this way. Circle 7 if the statement fits you extremely well, that is, you almost always do things this way. Use the values in between to indicate that the statement fits you in varying degrees.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

There are, of course, no right or wrong answers. Please read each statement and circle the number on the scale next to the statement that best indicates how well the statement describes you.

Please proceed at your own pace, but do not spend too much time on any one statement.

If you have any questions, feel free to ask them now.

### The Legislative Style

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

- \_\_\_\_\_ 1. When making decisions, I tend to rely on my own ideas and ways of doing things.  
 \_\_\_\_\_ 2. When faced with a problem I use my own ideas and strategies to solve it.  
 \_\_\_\_\_ 3. I like to play with my ideas and see how far they go.  
 \_\_\_\_\_ 4. I like problems where I can try my own way of solving them.  
 \_\_\_\_\_ 5. When working on a task, I like to start with my own ideas.  
 \_\_\_\_\_ 6. Before starting a task, I like to figure out for myself how I will do my work.  
 \_\_\_\_\_ 7. I feel happier about a job when I can decide for myself what and how to do it.  
 \_\_\_\_\_ 8. I like situations where I can use my own ideas and ways of doing things.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Legislative Style.

\_\_\_\_\_ Score for Legislative Style.

### The Executive Style

- \_\_\_\_\_ 1. When discussing or writing down ideas, I follow formal rules of presentation.  
 \_\_\_\_\_ 2. I am careful to use the proper method to solve any problem.  
 \_\_\_\_\_ 3. I like projects that have a clear structure and a set plan and goal.  
 \_\_\_\_\_ 4. Before starting a task or project, I check to see what method or procedure should be used.  
 \_\_\_\_\_ 5. I like situations in which my role or the way I participate is clearly defined.  
 \_\_\_\_\_ 6. I like to figure out how to solve a problem following certain rules.  
 \_\_\_\_\_ 7. I enjoy working on things that I can do by following directions.  
 \_\_\_\_\_ 8. I like to follow definite rules or directions when solving a problem or doing a task.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Executive Style.

\_\_\_\_\_ Score for Executive Style.



1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The Judicial Style

- \_\_\_ 1. When discussing or writing down ideas, I like criticizing others' ways of doing things.
- \_\_\_ 2. When faced with opposing ideas, I like to decide which is the right way to do something.
- \_\_\_ 3. I like to check and rate opposing points of view or conflicting ideas.
- \_\_\_ 4. I like projects where I can study and rate different views and ideas.
- \_\_\_ 5. I prefer tasks or problems where I can grade the design or methods of others.
- \_\_\_ 6. When making a decision, I like to compare the opposing points of view.
- \_\_\_ 7. I like situations where I can compare and rate different ways of doing things.
- \_\_\_ 8. I enjoy work that involves analyzing, grading, or comparing things.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Judicial Style.

\_\_\_ Score for Judicial Style.

### The Monarchic Style

- \_\_\_ 1. When talking or writing about ideas, I stick to one main idea.
- \_\_\_ 2. I like to deal with major issues or themes, rather than details or facts.
- \_\_\_ 3. When trying to finish a task, I tend to ignore problems that come up.
- \_\_\_ 4. I use any means to reach my goal.
- \_\_\_ 5. When trying to make a decision, I tend to see only one major factor.
- \_\_\_ 6. If there are several important things to do, I do the one most important to me.
- \_\_\_ 7. I like to concentrate on one task at a time.
- \_\_\_ 8. I have to finish one project before starting another one.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Monarchic Style.

\_\_\_ Score for Monarchic Style.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The Hierarchic Style

- \_\_\_ 1. I like to set priorities for the things I need to do before I start doing them.
- \_\_\_ 2. In talking or writing down ideas, I like to have the issues organized in order of importance.
- \_\_\_ 3. Before starting a project, I like to know the things I have to do and in what order.
- \_\_\_ 4. In dealing with difficulties, I have a good sense of how important each of them is and what order to tackle them in.
- \_\_\_ 5. When there are many things to do, I have a clear sense of the order in which to do them.
- \_\_\_ 6. When starting something, I like to make a list of things to do and to order the things by importance.
- \_\_\_ 7. When working on a task, I can see how the parts relate to the overall goal of the task.
- \_\_\_ 8. When discussing or writing down ideas I stress the main idea and how everything fits together.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Hierarchic Style.

\_\_\_ Score for Hierarchic Style.

### The Oligarchic Style

- \_\_\_ 1. When I undertake some task, I am usually equally open to starting by working on any of several things.
- \_\_\_ 2. When there are competing issues of importance to address in my work, I somehow try to address them simultaneously.
- \_\_\_ 3. Usually when I have many things to do, I split my time and attention equally among them.
- \_\_\_ 4. I try to have several things going on at once, so that I can shift back and forth between them.
- \_\_\_ 5. Usually I do several things at once.
- \_\_\_ 6. I sometime have trouble setting priorities for multiple things that I need to get done.
- \_\_\_ 7. I usually know what things need to be done, but I sometimes have trouble deciding in what order to do them.
- \_\_\_ 8. Usually when working on a project, I tend to view almost all aspects of it as equally important.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Oligarchic Style.

\_\_\_ Score for Oligarchic Style.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The Anarchic Style

- \_\_\_ 1. When I have many things to do, I do whatever occurs to me first.
- \_\_\_ 2. I can switch from one task to another easily, because all tasks seem to me to be equally important.
- \_\_\_ 3. I like to tackle all kinds of problems, even seemingly trivial ones.
- \_\_\_ 4. When discussing or writing down ideas, I use whatever comes to mind.
- \_\_\_ 5. I find that solving one problem usually leads to many other ones, that are just as important.
- \_\_\_ 6. When trying to make a decision, I try to take all points of view into account.
- \_\_\_ 7. When there are many important things to do, I try to do as many as I can in whatever time I have.
- \_\_\_ 8. When I start on a task, I like to consider all possible ways of doing it, even the most ridiculous.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Anarchic Style.

\_\_\_ Score for Anarchic Style.

### The Global Style

- \_\_\_ 1. I like situation or tasks in which I am not concerned with details.
- \_\_\_ 2. I care more about the general effect than about the details of a task I have to do.
- \_\_\_ 3. In doing a task, I like to see how what I do fits into the general picture.
- \_\_\_ 4. I tend to emphasize the general aspect of issues or the overall effect of a project.
- \_\_\_ 5. I like situations where I can focus on general issues, rather than on specifics.
- \_\_\_ 6. In talking or writing down ideas, I like to show the scope and context of my ideas, that is, the general picture.
- \_\_\_ 7. I tend to pay little attention to details.
- \_\_\_ 8. I like working on projects that deal with general issues and not with nitty-gritty details.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Global Style.

\_\_\_ Score for Global Style.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The Local Style

- \_\_\_ 1. I prefer to deal with specific problems rather than with general questions.
- \_\_\_ 2. I prefer tasks dealing with a single concrete problem, rather than general or multiple ones.
- \_\_\_ 3. I tend to break down a problem into many smaller ones that I can solve, without looking at the problem as a whole.
- \_\_\_ 4. I like to collect detailed or specific information for projects I work on.
- \_\_\_ 5. I like problems where I need to pay attention to detail.
- \_\_\_ 6. I pay more attention to the parts of a task than to its overall effect or significance.
- \_\_\_ 7. In discussing or writing on a topic, I think the details and facts are more important than the overall picture.
- \_\_\_ 8. I like to memorize facts and bits of information without any particular content.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Local Style.

\_\_\_ Score for Local Style.

### The Internal Style

- \_\_\_ 1. I like to control all phases of a project, without having to consult others.
- \_\_\_ 2. When trying to make a decision, I rely on my own judgment of the situation.
- \_\_\_ 3. I prefer situations where I can carry out my own ideas, without relying on others.
- \_\_\_ 4. When discussing or writing down ideas, I only like to use my own ideas.
- \_\_\_ 5. I like project that I can complete independently.
- \_\_\_ 6. I prefer to read reports for information I need, rather than ask others for it.
- \_\_\_ 7. When faced with a problem, I like to work it out by myself.
- \_\_\_ 8. I like to work alone on a task or problem.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Internal Style.

\_\_\_ Score for Internal Style.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The External Style

- \_\_\_ 1. When starting a task, I like to brainstorm ideas with friends or peers.
- \_\_\_ 2. If I need more information, I prefer to talk about it with others rather than to read reports on it.
- \_\_\_ 3. I like to participate in activities where I can interact with others as a part of a team.
- \_\_\_ 4. I like projects in which I can work together with others.
- \_\_\_ 5. I like situations where I interact with others and everyone works together.
- \_\_\_ 6. In a discussion or report, I like to combine my own ideas with those of others.
- \_\_\_ 7. When working on a project, I like to share ideas and get input from other people.
- \_\_\_ 8. When making a decision, I try to take the opinions of others into account.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the External Style.

\_\_\_ Score for External Style.

### The Liberal Style

- \_\_\_ 1. I enjoy working on projects that allow me to try novel ways of doing things.
- \_\_\_ 2. I like situations where I can try new ways of doing things.
- \_\_\_ 3. I like to change routines in order to improve the way tasks are done.
- \_\_\_ 4. I like to challenge old ideas or ways of doing things and to seek better ones.
- \_\_\_ 5. When faced with a problem I prefer to try new strategies or methods to solve it.
- \_\_\_ 6. I like projects that allow me to look at a situation from a new perspective.
- \_\_\_ 7. I like to find old problems and find new methods to solve them.
- \_\_\_ 8. I like to do things in new ways not used by others in the past.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Liberal Style.

\_\_\_ Score for Liberal Style.

1	2	3	4	5	6	7
Not At All Well	Not Very Well	Slightly Well	Somewhat Well	Well	Very Well	Extremely Well

### The Conservative Style

- \_\_\_ 1. I like to do things in ways that have been used in the past.
- \_\_\_ 2. When I'm in charge of something, I like to follow methods and ideas used in the past.
- \_\_\_ 3. I like tasks and problems that have fixed rules to follow in order to complete them.
- \_\_\_ 4. I dislike problems that arise when doing something in the usual, customary way.
- \_\_\_ 5. I stick to standard rules or ways of doing things.
- \_\_\_ 6. I like situations where I can follow a set routine.
- \_\_\_ 7. When faced with a problem, I like to solve it in a traditional way.
- \_\_\_ 8. I like situations where the role I play is a traditional one.

Add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. This is your score for the Conservative Style.

\_\_\_ Score for Conservative Style.

### Interpreting Scores

Thinking Styles are part of R. J. Sternberg's theory of Mental Self-Government. The theory addresses the question of how people govern and manage their everyday cognitive activities, within the school and without. The theory includes the following premises:

1. Styles are preferences in the use of abilities, not abilities themselves.
2. A match between styles and abilities creates a synergy that is more than the sum of its parts.
3. Life choices need to fit styles as well as abilities.
4. People have profiles (or patterns) of styles, not just a single style.
5. Styles are variable across tasks and situations.
6. People differ in the strength of their preferences.
7. People differ in their stylistic flexibility.
8. Styles are socialized.
9. Styles can vary across the life span.
10. Styles are measurable.
11. Styles are teachable.
12. Styles valued at one time may not be valued at another.
13. Styles valued in one place may not be valued in another.
14. Styles are not, on average, good or bad-it's a question of fit.
15. We confuse stylistic fit with levels of abilities.

You should have a number between 1.0 and 7.0 for each Thinking Style. There are six categories of scores for each Thinking style.

The functions of mental self-government include the Thinking Styles of Legislative, Executive, and Judicial. The six categories are shown below for each function.

### The Legislative Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	6.2-7.0	6.0-7.0
High	(11%-25%)	5.6-6.1	5.6-5.9
High Middle	(26%-50%)	5.1-5.5	5.1-5.5
Low Middle	(51%-75%)	4.4-5.0	4.5-5.0
Low	(76%-90%)	4.0-4.3	4.1-4.4
Very Low	(91%-100%)	1.0-3.9	1.0-4.0

If you scored in the “very high” category, then you have all or almost all of the characteristics of a legislative person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how legislative you are may vary across tasks, situations, and your time of life.

Legislative people like to do things in their own way. They like creating formulating, and planning things. In general, they tend to be people who like to make their own rules. Legislative people enjoy doing things the way they decide to do them. They prefer problems that are not prestructured for them, but rather that they can structure for themselves. This tendency can be costly in many environments.

Legislative people also prefer creative and constructive planning-based activities, such as writing papers, designing projects, and creating new kinds of systems. Often, very successful entrepreneurs succeed precisely because they are legislative and want to create their own way of doing things.

Legislative people tend to adapt particularly well, on the whole, to certain occupations. Examples of occupations they typically like are novelist, playwright, poet, mathematician, scientist, architect, inventor, fashion designer, policy maker, entrepreneur, composer, choreographer, and advertising creative copywriter.



In school as well as at work, legislative people are often viewed as not fitting in or perhaps as annoying. They want to do things their own way, which more often than not does not correspond to the way of the institution. In an organization that has a fixed way of doing things and expects its members to do things in that way, the legislator has no respected place.

### The Executive Style

#### College Student Adults

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	Category	Male	Female
Very High	(1%-10%)	5.5-7.0	5.1-7.0
High	(11%-25%)	5.0-5.4	4.9-5.0
High Middle	(26%-50%)	4.2-4.9	4.2-4.8
Low Middle	(51%-75%)	3.6-4.1	3.7-4.1
Low	(76%-90%)	3.1-3.5	3.1-3.6
Very Low	(91%-100%)	1.0-3.0	1.0-3.0

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If you scored in the “very high” category, then you have all or almost all of the characteristics of an executive person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how executive you are may vary across tasks, situations, and your time of life.

Executive people like to follow rules and prefer problems that are prestructured or prefabricated. They like to fill in the gaps within existing structures rather than to create the structures themselves. Basically, people with the executive style are implementers: They like to do, and generally prefer to be given guidance as to what to do or how to do what needs to be done. These are people who like to follow rules. Executive people can often tolerate the kinds of bureaucracies that drive more legislative people batty.

Executive people also like to enforce rules and laws (their own or others’). Executive people prefer problems that are given to them or structured for them and like to be and take pride in being doers-in getting things done. It is for this reason that legislative-executive teams can be so successful. The legislative person often gets his or her satisfaction out of proposing, the executive person, out of getting done what was in the proposal. The two kinds of people thus well complement each other.

Executive people tend to gravitate toward occupations that are quite different from those to which legislative people are attached. Some of the occupations executive people tend to like are police officer, soldier, teacher, administrator, applied researcher who is given problems to

work on by management, driver, firefighter, and certain types of medical doctor. Their pattern of likes and dislikes is essentially the opposite of that of legislative people.

Executive people will tend to be valued by organizations that want people to do things in a way that adheres to a set of rules or guidelines.

### The Judicial Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	5.3-7.0	5.6-7.0
High	(11%-25%)	4.6-5.2	5.0-5.5
High Middle	(26%-50%)	4.2-4.5	4.6-4.9
Low Middle	(51%-75%)	3.9-4.1	4.2-4.5
Low	(76%-90%)	3.5-3.8	3.2-4.1
Very Low	(91%-100%)	1.0-3.4	1.0-3.1

If you scored in the “very high” category, then you have all or almost all of the characteristics of a judicial person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how Judicial you are may vary across tasks, situations, and your time of life.

People with a judicial style like to evaluate rules and procedures and to judge things. Judicial people also prefer problems in which they can analyze and evaluate things and ideas. Judicial people like to judge both structure and content. They serve a valuable function in making sure that the proposals of the more legislative people are, in fact, suitable ones.

Judicial people may end up making their judgments on the basis of information that is not as adequate as it ideally could or should be. It important that judicial people be given the training they need in order to judge things properly.

Some of the kinds of activities that judicial people prefer are writing critiques, giving opinions, judging people and their work, and evaluating programs. Some examples of occupations that tend to be particularly suitable for judicial people are judge, critic, program evaluator, admissions officer, grant or contract monitor, systems analyst, and consultant.

Every organization needs judicial people as well as legislative and executive ones. None of these styles is “better” than the others, simply because no organization could work over the

long term without all of the styles being represented. Of course, these functions do not have to be fulfilled by separate people. The same person can and typically will perform all three of these functions in greater or lesser degree. But people often feel more comfortable in one role or another, and matching people to roles often facilitates the quality of the output in the organization, as well as leaving people happier with their responsibilities.

The forms of mental self-government include the Thinking Styles of monarchic, hierarchic, oligarchic, and anarchic. The six categories are shown below for each form.

### The Monarchic Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	4.6-7.0	5.0-7.0
High	(11%-25%)	4.1-4.5	4.4-4.9
High Middle	(26%-50%)	3.6-4.0	4.0-4.3
Low Middle	(51%-75%)	3.2-3.5	3.5-3.9
Low	(76%-90%)	3.0-3.1	3.1-3.4
Very Low	(91%-100%)	1.0-2.9	1.0-3.0

If you scored in the “very high” category, then you have all or almost all of the characteristics of a monarchic person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how monarchic you are may vary across tasks, situations, and your time of life.

People who exhibit a predominantly monarchic style tend to be motivated by a single goal or need at a time. If you get married to one of these people it usually doesn't take long to find out. If the person is monarchic about something, or worse, someone other than you, you're likely to find out rather quickly. The person who is monarchic about his or her work, for example, may not be around much!

Monarchic people also tend to be single-minded and driven by what ever they are single-minded about. Many people whom we fliply call “obsessive-compulsive” are not obsessive-compulsive in the strict clinical sense. Stories about obsession are often really about people with a monarchic style.

Monarchic people have a tendency to see things in terms of their “issue.” Monarchic people often attempt to solve problems, full speed ahead, damn the obstacles. They can be decisive,

and occasionally too decisive. If a monarchic person cannot see how something relates to a preferred issue, the person may find the thing lacking in interest. This means that their interest can often be grabbed if one relates what one has to offer to their issue. It is a characteristic of monarchic people that their interest may switch, but their tendency to be monarchic about something usually doesn't.

### The Hierarchic Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	6.8-7.0	6.1-7.0
High	(11%-25%)	5.9-6.7	5.5-6.0
High Middle	(26%-50%)	5.0-5.8	5.0-5.4
Low Middle	(51%-75%)	4.8-4.9	4.3-4.9
Low	(76%-90%)	4.0-4.7	3.9-4.2
Very Low	(91%-100%)	1.0-3.9	1.0-3.8

If you scored in the "very high" category, then you have all or almost all of the characteristics of a hierarchic person. If you scored in the "high" category, you have many of these characteristics. And if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how hierarchic you are may vary across tasks, situations, and your time of life.

People with a hierarchic style tend to be motivated by a hierarchy of goals, with the recognition that not all of the goals can be fulfilled equally well and that some goals are more important than others. They thus tend to be priority setters who allocate their resources carefully. Whereas monarchic people prefer to concentrate heavily on one thing-essentially to put all their eggs in one basket-hierarchic people like to divide up their resources.

Hierarchic people tend to be systematic and organized in their solutions to problems and in their decision making. Perhaps this organization is part of what puts them at a great advantage in school and in many other institutions.

Is it ever bad to be hierarchic? It can be. Keep in mind that styles are not in and of themselves good or bad. For example, if one has a monumental project to get done, it may be more advantageous to be monarchic. Or if a company has a single goal, such as the bottom-line profit, the monarchic person may be at an advantage in the realization of this goal. Hierarchic people can also become so fixated on the various elements of the hierarchy

that they become indecisive. One needs to spend the time arranging the priorities, but also ensuring that they are carried out.

### The Oligarchic Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	4.4-7.0	5.0-7.0
High	(11%-25%)	4.0-4.3	4.3-4.9
High Middle	(26%-50%)	3.4-3.9	3.8-4.2
Low Middle	(51%-75%)	2.8-3.3	3.0-3.7
Low	(76%-90%)	2.1-2.7	2.4-2.9
Very Low	(91%-100%)	1.0-2.0	1.0-2.3

If you scored in the “very high” category, then you have all or almost all of the characteristics of an oligarchic person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how oligarchic you are may vary across tasks, situations, and your time of life.

In an oligarchy, several individuals share power equally. Individuals with the oligarchic style tend to be motivated by several, often competing goals of equal perceived importance. They have trouble deciding which goals to give priority to. The result is that they may have trouble allocating resources. They may have the ability to do excellent work, but it doesn't always show through if they are in a situation that requires resource allocation.

Because oligarchic people do not take to it naturally, they may need to be guided in the setting of priorities. In instances where there is sufficient time or there are sufficient resources to get everything done, their oligarchic style may not even show through. But in instances where there is a resource allocation problem, either direct guidance or other forms of assistance can make them potentially quite effective.

In a way, an oligarchic person is a cross between a monarchic person and a hierarchic one. Like the monarchic person the oligarchic one is not a natural priority setter. And like the hierarchic person, the oligarchic person likes to do multiple things at once. In fact, in situations where there are no resource limitations, the oligarchic person may be indistinguishable from the hierarchic one.

Oligarchic employees and students sometimes suffer because they have competing demands on their time, and if, for example, they have short-term and long-term projects, they may find

themselves putting their time into one set of projects and neglecting the other. People in managerial and other kinds of jobs sometimes fail because they pay attention to the pressing short-term issues, but fail to allow time for the less pressing, but ultimately perhaps more important, long-term issues.

### The Anarchic Style

#### College Student Adults

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	Category	Male	Female
Very High	(1%-10%)	5.2-7.0	5.5-7.0
High	(11%-25%)	4.8-5.1	4.9-5.4
High Middle	(26%-50%)	4.5-4.7	4.4-4.8
Low Middle	(51%-75%)	3.9-4.4	3.8-4.3
Low	(76%-90%)	3.4-3.8	3.4-3.7
Very Low	(91%-100%)	1.0-3.3	1.0-3.3

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If you scored in the “very high” category, then you have all or almost all of the characteristics of an anarchic person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how anarchic you are may vary across tasks, situations, and your time of life.

People with an anarchic style tend to be motivated by a wide assortment of needs and goals that are often difficult for others, as well as for themselves, to sort out. They tend to be not so much asystematic as antisystematic. They are likely to disdain the system in place, sometimes with good reason, but other times for less clear reasons. As a result, they tend to be unwelcome in most organizational settings.

Anarchic people further tend to take a random approach to problems. When placed in a conversation with hierarchical people, the two kinds of people can drive each other nuts. The anarchic person tends to be “all over the place” and to have trouble setting priorities because they have no firm set of rules upon which to base these priorities.

The anarchic style would seem to be unlike other styles in being a “bad” style-after all, who in an institution wants anarchists around? Is this style an exception to the generalization that styles are not good or bad, but rather differentially useful in different situations? Anarchic people have several important contributions they can make. Not the least of these is to challenge the system, if people can retain their patience with the anarchist.

Equally important, anarchic people often have a certain potential for creativity that is rare in others. Why? Because anarchists are willing to grab a little from here, a little from there, and a little from somewhere else. They are not constrained by the boundaries that people normally throw up between domains of thought and action. They are willing to reach out and bring things together in ways that most people would never consider. Anarchic people can have a lot to offer if they are able to channel their offerings effectively. So they, like anyone else, have a contribution to make in a complex and ever-changing society.

The levels of mental self-government include the Thinking Styles of global and local. The six categories are shown below for each level.

### The Global Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	5.3-7.0	5.5-7.0
High	(11%-25%)	4.5-5.2	4.8-5.4
High Middle	(26%-50%)	4.0-4.4	4.1-4.7
Low Middle	(51%-75%)	3.5-3.9	3.6-4.0
Low	(76%-90%)	3.1-3.4	2.9-3.5
Very Low	(91%-100%)	1.0-3.0	1.0-2.8

If you scored in the “very high” category, then you have all or almost all of the characteristics of the global person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how global you are may vary across tasks, situations, and your time of life.

Global people prefer to deal with relatively larger and often abstract issues, and they ignore or don't like details. They tend to focus on the forest, sometimes at the expense of the trees that constitute the forest. Their constant challenge is to stay grounded and not to get lost on Cloud Nine. In general, successively higher levels of responsibility demand successively more global functioning.

Unfortunately, some of the globalists will have been selected out because they could not comfortably handle the local tasks required earlier in their careers.

## The Local Style

## College Student Adults

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	Category	Male	Female
Very High	(1%-10%)	4.9-7.0	4.5-7.0
High	(11%-25%)	4.4-4.8	4.3-4.4
High Middle	(26%-50%)	3.8-4.3	4.0-4.2
Low Middle	(51%-75%)	3.2-3.7	3.5-3.9
Low	(76%-90%)	2.8-3.1	2.9-3.4
Very Low	(91%-100%)	1.0-2.7	1.0-2.8

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If you scored in the “very high” category, then you have all or almost all of the characteristics of the local person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how local you are may vary across tasks, situations, and your time of life.

Local people prefer to deal with details, global people with the big picture. Although the global and local styles are often viewed as two ends of the same continuum, they are not necessarily expressed in that way. Most people tend to be either more global or more local: They focus either more on the big picture or more on the small details. But some people are both: They are equally attentive to the big picture and to the little details.

Moreover, these people may be more attentive to both the global and the local picture than other people are to either. Other people may be either global or local, but show different stylistic tendencies in different domains. Thus although the two styles are usually contrasted with each other, they don't have to be.

Local People prefer to deal with details, sometimes minute ones, and often ones surrounding concrete issues. They tend to focus on the trees, sometimes at the expense of the forest. They also tend to be pragmatic in a situation, and are down-to-earth. Their constant challenge is to see the whole forest, and not just its individual elements.

Although most people have a preference to work at either a more global or a more local level, a key to successful problem solving in many situations is being able to traverse between levels. In early stages of careers, where one is largely self-dependent, inability to switch between levels of processing may be disastrous.



The scope of mental self-government include the Thinking Styles of internal and external. The six categories are shown below for each scope.

### The Internal Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	5.3-7.0	5.0-7.0
High	(11%-25%)	4.5-5.2	4.5-4.9
High Middle	(26%-50%)	3.9-4.4	4.0-4.4
Low Middle	(51%-75%)	3.1-3.8	3.5-3.9
Low	(76%-90%)	2.8-3.0	3.0-3.4
Very Low	(91%-100%)	1.0-2.7	1.0-2.9

If you scored in the “very high” category, then you have all or almost all of the characteristics of the internal person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how internal you are may vary across tasks, situations, and your time of life.

People with an internal style tend to be introverted, task-oriented, sometimes aloof, and socially less sensitive than other people. At times, they also lack interpersonal awareness, if only because they do not focus on it. Internal people prefer to work alone and to deal on an individual basis with the worlds of things and ideas in isolation from other people.

### The External Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	6.2-7.0	6.0-7.0
High	(11%-25%)	5.6-6.1	5.6-5.9
High Middle	(26%-50%)	5.1-5.5	4.9-5.5
Low Middle	(51%-75%)	4.1-5.0	4.0-4.8
Low	(76%-90%)	3.8-4.0	2.8-3.9
Very Low	(91%-100%)	1.0-3.7	1.0-2.7

If you scored in the “very high” category, then you have all or almost all of the characteristics of the external person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how external you are may vary across tasks, situations, and your time of life.

People with an external style tend to be more extroverted, people-oriented, outgoing, socially more sensitive, and interpersonally more aware of what is going on with others. External people prefer to work with others and to deal with the world of people.

The leanings of mental self-government include the Thinking Styles of liberal and conservative. The six categories are shown below for each leaning.

### The Liberal Style

#### College Student Adults

	Category	Male	Female
Very High	(1%-10%)	6.3-7.0	6.0-7.0
High	(11%-25%)	5.6-6.2	5.8-5.9
High Middle	(26%-50%)	5.0-5.5	5.0-5.7
Low Middle	(51%-75%)	4.1-4.9	4.2-4.9
Low	(76%-90%)	3.6-4.0	3.8-4.1
Very Low	(91%-100%)	1.0-3.5	1.0-3.7

If you scored in the “very high” category, then you have all or almost all of the characteristics of the liberal person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how liberal you are may vary across tasks, situations, and your time of life.

Individuals with a liberal style like to go beyond existing rules and procedures and to seek maximize change. They also seek or are at least comfortable with ambiguous situations, and prefer some degree of unfamiliarity in life and work. Thrill seekers tend to have a liberal style, as do people who, in general, quickly become bored.

## The Conservative Style

### College Student Adults

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	Category	Male	Female
Very High	(1%-10%)	4.8-7.0	4.8-7.0
High	(11%-25%)	4.2-4.7	4.4-4.7
High Middle	(26%-50%)	3.9-4.1	3.8-4.3
Low Middle	(51%-75%)	3.1-3.8	3.2-3.7
Low	(76%-90%)	2.4-3.0	2.8-3.6
Very Low	(91%-100%)	1.0-2.3	1.0-2.7

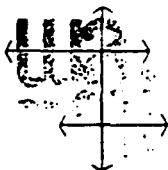
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If you scored in the “very high” category, then you have all or almost all of the characteristics of the conservative person. If you scored in the “high” category, you have many of these characteristics. And if you scored in the “high middle” category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how conservative you are may vary across tasks, situations, and your time of life.

Individuals with a conservative style like to adhere to existing rules and procedures, minimize change, avoid ambiguous situations where possible, and prefer familiarity in life and work. They are happiest in a structured and relatively predictable environment. When such structure does not exist, the individual may seek to create it.

**APPENDIX B**

**Human Assurances Committee Approval**



## WAMI PROGRAM

REGIONAL MEDICAL EDUCATION  
MOSCOW, IDAHO 83844-4207

WASHINGTON/ALASKA/MONTANA/IDAHO

UNIVERSITY OF IDAHO  
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### MEMORANDUM

TO R. Wes Tucker, Education  
 FROM Michael B <sup>MBL</sup>Laskowski, Director, Human Assurances Committee  
 DATE September 9, 1998  
 SUBJECT Approval of Proposal Entitled: "Examination of Accounting Students Thinking Styles"

On behalf of the Human Assurances Committee I am pleased to inform you that the above-named proposal is approved as having no significant risk to human subjects. This approval is valid for one year from the date of this memo. Should there be a significant change in your proposal it will be necessary for you to resubmit for review. Thank you for submitting your proposal to the Human Assurances Committee

MBL:myh  
IRB/appr.doc

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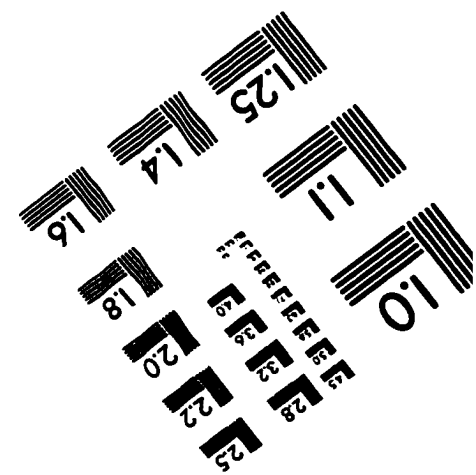
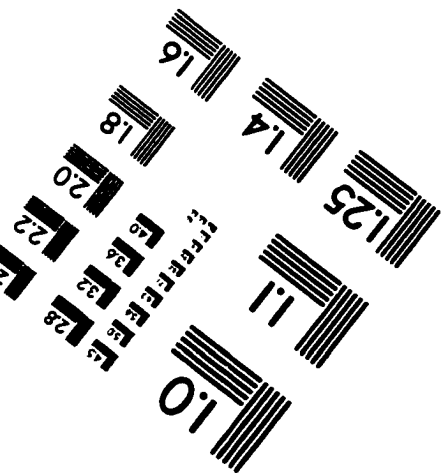
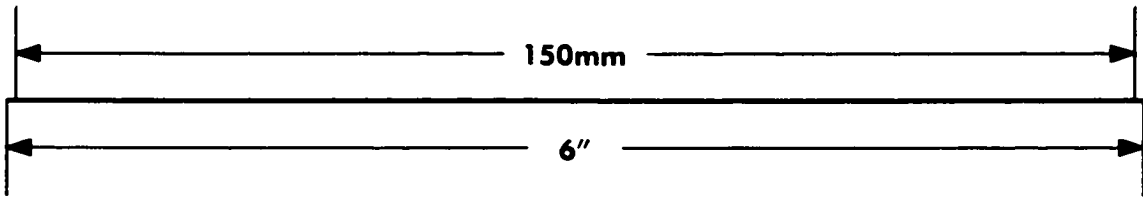
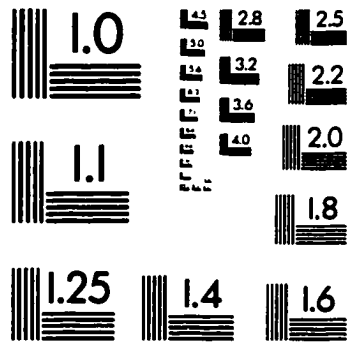
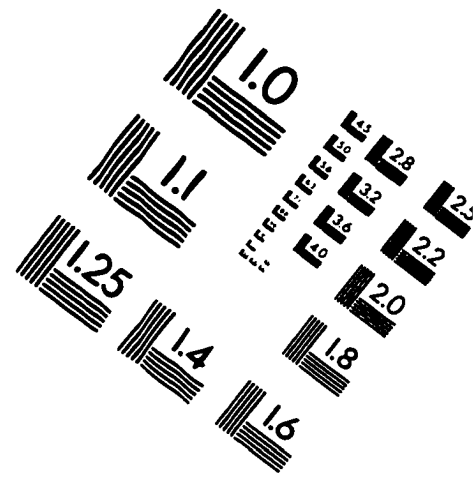
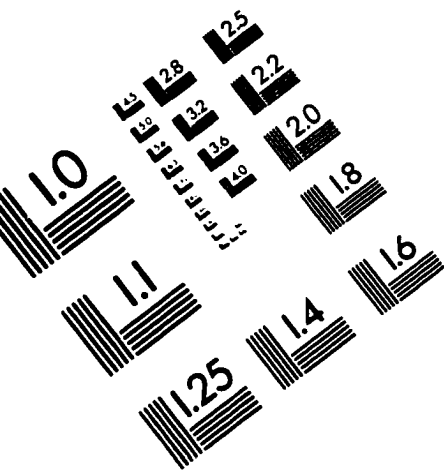
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