AN INVESTIGATION OF PRESIDENTIAL ELECTIONS USING JAQUES' CONSTRUCT OF MENTAL COMPLEXITY

by

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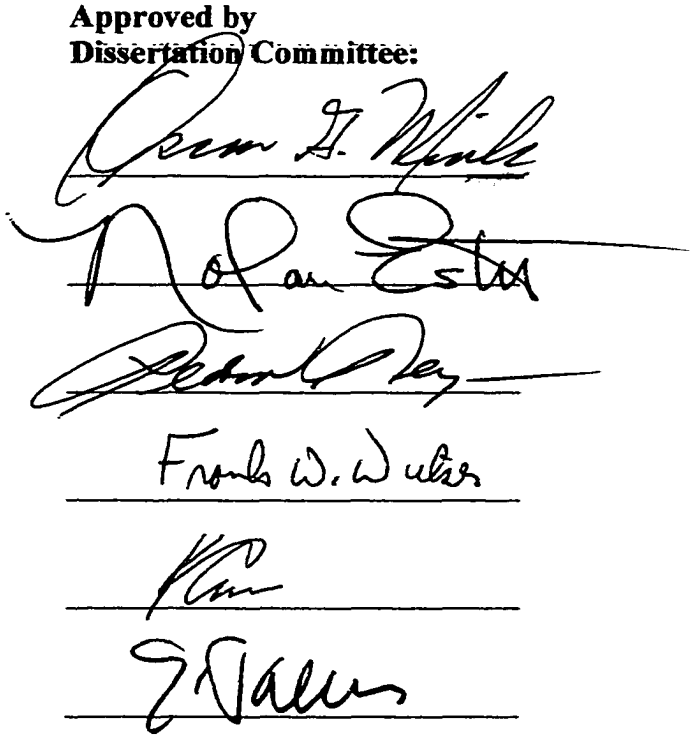

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DEDICATION

This dissertation is in memory of Dr. Jack Dunham, a mentor and friend.

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The purpose of this research was to explore the possibility that mental complexity is a factor in the election of Presidents of the United States. Mental complexity was assessed by using Jaques' model of Complexity of Mental Processing, a model for observing the way in which information is processed. Complexity of Mental Processing is determined by identifying patterns during the presentation of an argument or position in which a subject is fully engaged in the process.

The basic premise of this study is that mental complexity is an indicator of the capability of an individual.

Therefore the research question explored was: Is the presidential candidate with the highest Complexity of Mental Processing Level elected president by United States citizens who participate in the general presidential election process?

Transcripts of United States presidential debates were analyzed to determine the Complexity of Mental Processing Level of each candidate. In addition, transcripts of vice-presidential debates for primary candidates were analyzed.

Seven elections were examined. In five of these, the candidate who was a member of a major party and who demonstrated the highest mental complexity in the debates won the election. In two of these elections, both major party candidates demonstrated the same mental complexity in the presidential debates. In both of these cases the candidate who won was younger than his opponent. One candidate was 11 years younger and the other was 24 years younger. These exploratory results support the hypothesis that mental complexity is a factor in choosing presidents.

This study provides a useful methodology for future research into the relationship between Complexity of Mental Processing and leadership.

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CHAPTER 1
INTRODUCTION

In the study of organizations, the mental complexity of the various levels of managers is very important to the functioning of the organization (Jaques, 1988). Mental complexity has been studied by a number of scholars and practitioners in the Organization Development Field. (Mehltretter, 1995, Perlmutter, 1990, King, 1997). In particular Elliott Jaques'[1] (1998) work has been used to study the impact of mental complexity in Managerial Accountability Hierarchies, or vertical organizations in which accountability cascades down organizations. His findings indicate that mental complexity affects manager-subordinate relationships, an employee's personal effectiveness, and the structural level of managerial leadership that is appropriate. These ideas were extended to the presidential elections.

The Study

The purpose of this study was to determine if mental complexity is a factor in the election of Presidents of the United States.

The basic premise of this study is that mental complexity is an indicator of the capability of an individual.

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[1] Elliott Jaques has a B.A. Honors Science degree from the University of Toronto, an M.D. from Johns Hopkins Medical School, a Ph.D. in Social Relations from Harvard, and qualification as a psychoanalyst at the British Psychoanalytical Society. He is a Fellow of the Royal College of Psychiatry. He has authored 18 books and has been awarded the Joint Staff Certificate of Appreciation by General Colin Powell on behalf of the Joint Chiefs of Staff of the U.S. Armed Forces for "outstanding contributions in the field of military leadership theory and instruction to all of the service departments of the United States."

Therefore the research question explored was: "Is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States Citizens who participate in the general presidential election process?"

The Complexity of Mental Processing level is "the maximum scale and complexity of the world that you are able to pattern and construe and function in, including the amount and complexity of information that must be processed in doing so." (Jaques, 1996) The Complexity of Mental Processing level is assessed by examining the way arguments are constructed and the information that is used in those arguments.

An electoral process was chosen for the study because people with a variety of professional backgrounds, educational levels, ethnicities, ages, and genders vote in the United States electoral process. The election represents a "formal expression of choice" by United States citizens as a collective.

The Limitations of the Study

Transcripts from presidential debates were analyzed to answer the question "Is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States citizens who participate in the general election process?"

In this study, though the sample size was large in terms of comparison data between candidates, the sample size was small in terms of number of presidential candidates (22 presidential candidates, 9 vice-presidential candidates). Analyzing other United States presidential races would be useful in determining the implications of this study. It should be noted that additional presidential debate transcripts were not readily available.

Mental complexity may not be the only factor in determining the outcome of a presidential race. Many other factors may be important; for example, establishing a personal connection with voters.

Below are excerpts from a presidential debate between three candidates, with a live television audience present. They were asked the question: "Why can't your discussions and proposals reflect the genuine complexity and the difficulty of the issues to try to build a consensus around the best aspects of all proposals?"

> Candidate 1 responded, "I couldn't agree with you more, couldn't agree with you more. And I have said again and again and again let's get off mud wrestling, let's get off personalities and let's talk about jobs, health care, crime, the things that concern the American people. I'm spending my money-not PAC money, not foreign money, my money-to take this message to the people." (Transcript of the Presidential Debate, First Half of the Debate, October, 15, 1992, pp. 8)
>
> Candidate 2 responded, "I believe that character is a part of being president. I think you have to look at it. I think that has to be a part of a candidate for president or being president. In terms of programs, I've submitted what 4 different budgets to the US Congress in great detail. It's so heavy they'd give you a broken back. And everything in there says what

> I stand for..." (Transcript of the Presidential Debate, First Half of the Debate, October, 15, 1992, pp. 8)
>
> Candidate 3 responded, "Let me say first of all to you that I believe so strongly in the question you asked that I suggested this format tonight. I started doing these formats a year ago in New Hampshire and I found that we had huge crowds because all I did was let people ask questions and I tried to give very specific answers. I also had a program starting last year..." (Transcript of the Presidential Debate, First Half of the Debate, October 15, 1992, pp. 8,9)

This third candidate, who won the election, first made a personal connection to the questioner and validated that person's implied request. It is reasonable to infer that the ability to make that kind of personal connection is a factor in the outcome of an election.

This study was limited to presidential candidates who participated in presidential debates. This study did not examine local elections (school boards, city council, state, and legislative races), nor did it include the presidential primaries, with the exception of the year 2000 election. In addition, no elections outside the United States were considered. Other electoral processes may vary from the United States presidential races in the ways in which the mental complexity of the candidates impacts the election outcome. Thus the results of this study must only be considered in the context of the final vote of the United States presidential election.

Motivation for Study

I was first exposed to Jaques' work in 1987, at a time when I was embroiled in difficulties at work with my manager. While the Complexity of Mental Processing model had not yet been developed, Jaques' model of manager-subordinate relationships had been developed. Because this work explained so many of the difficulties I was experiencing in my job, I became an student of this model during the first semester of my graduate studies.

In 1999, I had the opportunity to work with Glenn Mehltretter Ph.D., protégé of Dr. Jaques, gaining extensive study and experience in assessing Complexity of Mental Processing levels. I evaluated approximately 130 interviews, rating the Complexity of Mental Processing level of each. Engaging in that process further convinced me that the level of Complexity of Mental Processing researched by Jaques and Cason (1994) is a useful variable to consider in manager-subordinate relationships, talent pool analysis, employee development, etc.

Since the model is useful in Managerial Hierarchies, I surmised that it might be applicable to leaders other than managers. The basic question arising from this speculation concerned whether mental complexity influenced the outcome of elections, therefore presidential elections seemed an appropriate context for the study.

Thus emerged the more specific question: "Is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States citizens who participate in the general presidential election process?

CHAPTER 2
LITERATURE REVIEW

The purpose of this chapter is to examine the theoretical concepts used in this study in order to investigate whether Complexity of Mental Processing is a factor in the election of President of the United States. To build this framework, Complexity of Mental Processing, Developmental Theories, Ways of Exploring Organizations, Time-Span of Discretion, and Strata have been investigated.

Complexity of Mental Processing

Jaques identified a model used to describe the complexity of the processes an individual has available to apply to his or her work. As this model, called Complexity of Mental Processing, has evolved so has the terminology used to describe the model.

The term first used to describe this model was cognitive processing. Cognitive is derived from the Latin root *cognitio* meaning knowledge. Jaques replaced the term "cognitive" processes with mental processes[1] to clearly

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[1]An effort was made to determine if a link could be made between cognitive processes as Jaques defines them and cognitive processes as described in the Educational Psychology literature. In consultations with Clair Weinstien (personal communication, Spring 1993) and Duane Shell (personal communication, Spring 1993), I was informed that there is no similarity between the way in which the term "cognitive processes" is discussed in the field of Educational Psychology and the way in which Elliott Jaques used the term "cognitive processes". It was suggested by Claire Weinstien that I review the "Learning Strategies Annotated Bibliography" (Shell, Myer, Weinstein, 1991) to determine if there was a link between the two approaches. The literature in the annotated bibliography describes effective learning strategies (e.g. Paris, Lipson, Wixon, 1983; Weinstein, 1982; Weinstein, 1988), or strategy and knowledge differences between experts and novices (e.g. Gobbs and Chi, 1986; Chi, Glaser, Rees, 1982; Larkin, McDermott, Simon P. and Simon A., 1980). Jaques, on the other hand, defines cognitive processes as mental processes that affect strategies for

demarcate a difference in his use of the term cognitive processes from others' use of the same term. Mental comes from the Latin root *mens* meaning mind.

As of the year 2000, Jaques has begun calling his model: Complexity of Information Processing. This change in terminology was because mental is associated with thinking, which Jaques now argues is static. In other words, thinking must occur with some goal in mind (E. Jaques, personal communication, August 15, 2000). The difference in terminology reflects changes in his basic assumptions:

a. ALL organisms process information.

b. What is important is input/output systems, rather than what's in the "black box".

For the purpose of this study, the term Complexity of Mental Processing is used to be consistent with the existing literature.

Jaques describes Mental Processes as processes that determine how information is organized. He postulates that these processes progressively increase in complexity in discontinuous stages. There are four processes identified: (1) Declarative Processing, (2) Cumulative Processing, (3) Serial Processing, and (4) Parallel Processing.

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doing work. It became clear to me through these discussions and readings that the Educational Psychology literature would not be appropriate to include in this literature review.

Declarative processors[2] put forth a position by providing a number of unrelated ideas to support their position; each idea stands alone. There is no explicit connection made between the ideas. Declarative Processing can be recognized by its staccato-like quality produced by the speaker's presentation of disconnected statements.

Example:

Idea A = Position
Idea B = Position
Idea C = Position

Logic:

A or B or C

Cumulative processors put forth a position by providing a number of related ideas to support the position. However, in contrast to Declarative Processing, each of the ideas cannot stand alone. Instead, the contribution of all the ideas together is used to support the position.

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[2]Declarative processing at first glance may appear to resemble stimulus/response learning theories. In each, information fits together in the form of direct association to the immediate situation (Hilgard and Bower, 1966; Jaques 1991). However, there are some important differences between the two. First, Stimulus/Response theories describe behavior (Hilgard and Bower, 1966) whereas Declarative Processing describes mental processes which influence behavior (Jaques, 1988, 1991). Secondly, in Stimulus/Response theories, the stimulus is thought to exist largely in the external world. In Jaques' theory the stimuli perceived are generated from the mental world (Jaques, 1988, 1991).

Example:

Idea A + Idea B + Idea C = Position

Logic:

A + B + C

Serial processors put forth a position by explaining how one idea leads to another idea, which leads to another idea. This linking of three or more ideas is called a series.

Example:

Idea A → Idea B → Idea C = Position

Logic:

If A then B, If B then C

Parallel processors put forth a position by providing a number of series (see above) which are interlinked. Thus, two or more series of ideas are held in parallel. An argument is built on interrelationships among a number of series.

Example:

Series 1	Idea A → Idea B → Idea C
Series 2	Idea E → Idea B → Idea D
Series 3	Idea F → Idea B → Idea D → Idea G → Position

Logic:

If A then B, if-and-only-if C, then D

If mental processes are the "how" people think, Orders of Information Complexity are the "what" people think about. "Orders of Information Complexity are the increasingly complex chunks of data in the external world which we must take in and give name to and use to inform our cognitive processing to solve problems." (Jaques, 1991b, p.57)

While Jaques readily admits his definitions require further clarification, the following is a description of the Orders of Information Complexity as Jaques and Cason have formulated them to date. There are five Orders of Information Complexity: (1) Self Explanatory Gesture, (2) Specifics, (3) Classes, (4) Conceptual Abstract, and (5) Universals. (Jaques, 2001)

Self Explanatory Gesture is more concrete than the other Orders of Information Complexity. Expression takes the form of gestures and physical touch with objects. Infants function at this level.

Specifics are most often used by children. Those who operate at this Order of Complexity of Information limit their use of language to tangible objects, which are either existing in the environment or presumed to be present in the environment because of the recentcy of their presence. Their language is often paired with the

object by pointing to the location in which the object resides or is thought to reside. While those operating at this level can contend with individual tangible entities, they are unable to contend with collections of tangible entities. (E. Jaques, personal communication, September 26, 2000)

Classes are most often used by adults. Words are used as symbols to refer to tangible entities no longer present in the environment. Also, those operating at this level can use not only collections of tangibles, but they can use individual intangible entities. (E. Jaques, personal communication, September 26, 2000)

Conceptual Abstract is being used when language is more than one step removed from an entity. Thus words and thoughts refer to other words and thoughts. This shift is reflected in the use of collections of intangibles. (E. Jaques, personal communication, September 26, 2000)

Universals are operative when the individual uses classes of classes of intangibles, or categories of intangibles. They are used to consider and solve problems that concern entire societies, moral systems, artistic masterpieces, and significant reforms in scientific theory.

Mental Processes and Orders of Information Complexity are the two components that make up Complexity of Mental Processing. The developmental stage of Complexity of Mental Processing of a particular individual can be observed, and therefore agreed upon for an individual. (E. Jaques, personal

communication, September 26, 2000) Complexity of Mental Processing is a model which also can be used to identify Current and Future Potential Capability.

Current Potential Capability is the highest complexity level of work that an individual can execute, given that he/she values the work and has the necessary experience and skilled knowledge required to successfully perform the work. Time Horizon, or the longest time-span an individual can handle at a given point in time, is a method for measuring potential capability. (Jaques, 1996)

Future Potential Capability is the level of potential capability a person will be able to exercise at a designated time in the future. Jaques and Cason argue that Future Potential Capability can be determined because human capability matures at an innately predictable rate and along a predictable path. (E. Jaques, personal communication, September 26, 2000)

Studies of Complexity of Mental Processing

Jaques and Cason conducted a study outlined in Human Capability (1994), indicating a strong relationship between level of work defined in terms of a level in an organization, and an individual's Complexity of Mental Processing Level. The two companies that participated in the study were: (1) Gilbert Commonwealth, located in Pennsylvania and Georgia, employing 5,000 people, and (2) CRA, located in Australia, the Pacific Basin, and Europe, employing 25,000 people. The

subjects were selected from these two companies, which had implemented Jaques' organizational model for five or more years. There were 72 subjects, 39 from CRA, 33 from Gilbert Commonwealth. Sixty-two (86%) were white males, seven were women and three were non-white males.

Correlations of .97 were obtained between the judgments made by the managers, the managers-once-removed, and the subjects, regarding the current potential capability of the subjects stated in terms of stratum. The correlations between judgments made by the managers-once-removed and the subjects, determining the subjects' current potential, were 0.96; correlations between the managers and subjects were .95; and between the managers-once-removed and the managers were .94. (Jaques and Cason, 1994)

In addition, Jaques and Cason (1994a) conducted a study to determine if the Mental Processes and Orders of Information Complexity could be identified by a trained observer. The trained observer concurred with the assessment Jaques and Cason made with respect to levels of Mental Processing and Orders of Information Complexity in 13 out of the 15 protocols presented. (Jaques and Cason, 1994a)

Cognitive Processing Used in the Literature

Traditionally cognitive processing has been used in the literature in a variety of ways. The variation in the meaning of the term "cognitive processes"

has depended upon its intended use.[3] As Bridgman pointed out, a "proper" definition for a concept is its set of operations and not its properties. "For of course the true meaning of a term is to be found by observing what a man does with it not by what he says about it." (Bridgman, 1927, p.7) While there are researchers who have used the term cognitive processing that have attempted to provide descriptions of those levels, no other theory has related cognitive processing levels with the organizational structure of a Managerial Accountability Hierarchy. The Managerial Accountability Hierarchy is defined by Jaques as "a system of roles in which an individual in a higher role (manager) is held accountable for the outputs of persons in immediately lower roles (subordinates) and can be called to account for their actions. (Jaques, 1996, Glossary and Index)

The theorists listed below were included in the Literature Review because Jaques initially selected the term cognitive processing level to describe the

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[3]Guildford's "Three Faces of Intellect" was examined to determine if there was a relationship between cognitive abilities described by Guildford and cognitive processes described by Jaques. Guildford classifies the factors of intelligence into three domains: Operations, Products and Contents. The domain that might have any relationship to Jaques' cognitive processes would be Operations, composed of Evaluation, Convergent Thinking, Divergent Thinking, Memory, and Cognition. Operations are applied to content which produces six products. Three of Guildford's operations (evaluation, convergent thinking, and divergent thinking), describe methods of approaching material. Memory and cognition describe abilities "Memory means retention of what is cognized." (Guildford, 1959, p. 470) It is measured by using closure skills that include filling in missing letters to complete words, knowledge of definitions, and categorizing letters and words that are similar (Guildford, 1959, p. 471). The basic difference is that the mental processes described by Jaques do not describe a strategy applied by the subject but rather a method for organizing the information of the subject's world.

complexity of the processes an individual has available to apply to his or her work. Consequently, it is important to see how this term was used in the literature.

Jensen

Jensen used the term "cognitive processing" to describe mental abilities. Jensen used a two-tiered system to describe these mental abilities. Level I represents the ability to take in a stimulus, store it, and then be able to later recognize the stimulus or recall it. Jensen equated this ability with rote learning and primary memory. Those who operate at Level II can change or manipulate the stimulus for more complex problem solving. Level II, according to Jensen is the General Intelligence factor measured by standard intelligence tests. Those operating at Level I function at a much more concrete level of abstraction, with a limited ability to change the form of the information taken in. Those operating at Level II have the ability to alter the form of the information, which allows for transforming and manipulating the data. (Jensen, 1974)

There are important differences between the work of Jaques and Jensen. Jensen had only one level (his Level II) that can be equated to a mental process, whereas Jaques has multiple levels of mental processes. Jensen clearly states that Level II in his hierarchy is the general intelligence factor. (Jensen, 1974) Jaques does not equate level of Mental Processing with intelligence nor does he try to compare Mental Processing level with intelligence.

Simultaneous and Successive Processing

Das, Kirby and Jarmin also identified two cognitive processes: simultaneous and successive processing. (Das, Kirby, Jarmin, 1975) The descriptions provided for simultaneous and successive processing were based upon Luria's observations of persons with lesions in the left hemisphere of the cortex. Lesions in the frontal-temporal area disrupted successive processing. Lesions in the occipital-parietal area disrupted simultaneous processing.

In simultaneous processing, elements are synthesized into a group. By tapping into any element or connection between elements in the group some portion of the entire group is accessible. That quality is necessary for an individual to grasp relationships. (Das, Kirby and Jarman, 1975)

In successive processing, elements are not grouped but are ordered and processed sequentially. The elements must be accessed serially. In simultaneous processing, one access point will activate all elements in the group. (Das, Kirby and Jarman, 1975)

There is a similarity between the way in which Das, Kirby, and Jarmin defined successive processing and the way in which Jaques conceptualizes serial processing. Both say the elements are ordered and processed sequentially. However, there is no direct relationship between Das, Kirby, and Jarmin's simultaneous processing and Jaques' parallel processing. The significance of Das,

Kirby and Jarmin's simultaneous processing is that one access point activates all the elements in a group. Jaques says that parallel processing occurs when there are two or more serial arguments that are interrelated. (Jaques, 1996)

Kaufman

Kaufman, drawing upon the work of Das, Kirby and Jarmin, incorporated the testing of sequential and simultaneous processing as an integral part of the Kaufman Assessment Battery for Children. Testing for simultaneous processing was accomplished by working problems that are "spatial analogies or organizational in nature." (Kaufman, 1983, p. 30) Simultaneous processing was seen to be more related to higher level intellectual functions, whereas sequential processing was seen to relate more to everyday school-oriented skills. (Kaufman, 1983 p. 30)

Because Kaufman used Das, Kirby, and Jarmin's mental processes, the fundamental difference from Jaques' work mentioned in the earlier discussion on Das, Kirby and Jarmin's work is applicable. Das, Kirby and Jarmin's simultaneous processing occurs when one access point activates all the elements in a group. Jaques says that parallel processing occurs when there are two or more serial arguments that are interrelated.

Developmental Theories Indicating Discontinuous Development

Complexity of Mental Processing is a maturation model with embedded discontinuities. It is useful to consider the commonalties as well as some important differences between Jaques' model of Complexity of Mental Processing and the models of other developmental theorists. While all of these theorists describe a hierarchical progression of some type, Jaques postulates that Complexity of Mental Processing is part of a person's constitution, unfolding with maturation at a predictable rate and in a predicable sequence. The rate of unfolding, however, follows a multi-track system, wherein some individuals progress to a higher level than others. Therefore, some individuals may progress to levels that others never experience. Most developmental theorists, on the other hand, present developmental models in which development progresses along a uni-track system.

Isaac and O'Connor

Isaac and O'Connor conducted a series of experiments that indicated the discontinuity of psychological development. The age range corresponding to a particular level of development varied greatly, often spanning two to three levels of development. (Isaac and O'Connor in Jaques' Level's of Abstraction, 1978)

As a result of the experiments they performed Isaac and O'Connor developed a series of structures to model developmental stages. Their model is based on a dynamic element composed of poles and relations. The poles and

relations shift back and forth from becoming more defined or discriminating to becoming less defined or confusing. Each shift in structure represents a more abstract stage of development. (Isaac and O'Connor in Jaques' Level's of Abstraction, 1978) The experiments used to produce Isaac's and O'Connor's model are briefly described below.

Isaac and O'Connor conducted three experiments to determine if they could obtain a multi-modal statistical distribution based upon subjects' responses to problems. They found multi-modal distributions that represent differences in the ability of individuals to operate at different levels of abstraction. These experiments support the notion of discontinuous development.

The first experiment involved sorting cards that could differ in one of five ways (color, shape, size, number, and content). Subjects were asked to sort the cards according to a particular principle predetermined by the experimenter but not disclosed to the subjects. The subjects were given the feedback 'right' or 'wrong' after placement of each card. Success was defined as placing 20 successive cards correctly. Five hundred subjects participated in the experiment and 50 failed to solve the problem. (Isaac and O'Connor in Jaques' Levels of Abstraction, 1978)

The second experiment involved a circular pattern of nine lights with a corresponding "Press" button and a tenth light with a "No Press" button. A card indicating the connections between the lights was displayed. Each time a button

was pressed, the light stayed on for three seconds. Then the successive light in the sequence lit up until the sequence was complete. The subjects were instructed to light the tenth button five successive times using buttons B1, B2, and B3. Pressing B2 prevented the tenth light from coming on, and thus preferably would not have been used. Experimenters recorded the time required to successfully complete the task and the number of buttons pressed. Three hundred and fifty subjects participated in the experiment. Fifty of those subjects failed to successfully complete the problem. (Isaac and O'Connor in Jaques' Levels of Abstraction, 1978)

The third experiment involved a rectangular pattern of 448 press buttons, with 67 electric bulbs arranged on two sides of the rectangle. Areas of the rectangle were divided into sections. Subjects were instructed to light bulb 11. To successfully accomplish this goal other bulbs first had to be lit. The subject had the option of pressing the reset button to start the process anew when desired. Experimenters recorded the time taken to successfully complete the task and the numbers of sections of the task completed. Five hundred subjects participated in the experiment, of which 172 either did not wish to complete the experiment, failed to complete the experiment, or took random actions. (Isaac and O'Connor in Jaques' Levels of Abstraction, 1978)

Those subjects who provided the least efficient responses fell into the first mode of the distribution, the subjects with the next most efficient responses were in

the second mode of the distribution, the next level of efficiency was in mode three, and the highest level of efficiency was in mode four.

Isaac and O'Connor designed similar experiments to test the effects of stress on skill, and obtained results that supported a multi-modal distribution of responses. These experiments testing psychological discontinuity and the effect of stress were conducted using children; again their findings met with similar results.

Piaget

Piaget, in his studies of children's language, reasoning, moral judgment, cognitive structure, and intelligence, constructed a theory of perceptual and intellectual development. Piaget, like Jaques, maintained that development is a discontinuous maturational process. Piaget did not describe the discontinuity to be as abrupt as Jaques, but he did describe a discontinuous maturational process, nevertheless.

Another similarity between Piaget and Jaques is that both indicate that the operations an individual can successfully perform at one stage are subsumed under the following stage. For example, a child functioning at Piaget's Formal Operational level can demonstrate all 16 operations represented in the truth table for two propositions. (Jaques and Cason, 1994a)

The comparison between the stages Piaget identified and the levels of Complexity of Mental Processing Jaques identified, is listed below.

Comparison Between Jaques' Complexity of Mental Processing Levels and Piaget's Stages of Cognitive Development of Children

Piaget Stages	Jaques' Complexity of Mental Processing Levels
Formal Operational	Specifics – Parallel
Concrete Operational	Specifics – Serial
Pre-operational	Specifics – Cumulative
Sub-stage six	Specifics – Declarative
Sensory Motor Sub-stage Five	Self Explanatory Gesture – Parallel
Sub-stage Four	Self Explanatory Gesture – Serial
Sub-stage Three	Self Explanatory Gesture – Cumulative
Sub-stages One and Two	Self Explanatory Gesture – Declarative

Table 1 (Adapted from Jaques and Cason, 1994, p. 101)

There are two significant differences between the theory Piaget advanced and Jaques' theory of Complexity of Mental Processing. First, Jaques uses a multi-track model to describe maturation, i.e., an individual's maturation follows only one out of a number of possible tracks. Piaget described only a one-track maturational process.

Second, Piaget describes a maturational endpoint to which all individuals mature and which is influenced greatly by the environment. Jaques describes a maturational system in which there are multiple endpoints, only one of which an individual will tend toward, depending upon the individual's constitution.

Stamp

Stamp conducted an investigation to study the nature of human capability as Jaques defined it, and to understand the expression of individual differences. Though her model represents stages corresponding to Jaques' stages, it is important to note that her stages are not objectively measurable, and that Stamp relied on Jaques' strata to classify responses (E. Jaques, personal communication, August 15, 2000).

The study utilized a card-sorting experiment developed by Isaac and O'Connor, and was based on Bruner's work. The purpose of the experiment was to understand how an individual arrives at knowledge, rather than to examine the actual knowledge itself. A subject was handed a pack of 81 cards. On each card was one of three geometric shapes, which varied in size and shape. The subject started with four cards being displayed, one of which was blank. The experimenter provided the subject with four pieces of information: (1) the cards were to be sorted according to a predetermined criterion that the subject must discover, (2) when a card was placed in front of any card except the blank card the subject would be told whether it was a correct or incorrect card sort, (3) when a card was placed in front of the blank card no feedback would be provided, (4) completion of the task would be determined by 20 consecutive correct card placements. (Stamp, 1981)

Upon completion of the task, the experimenter asked the subject to explain the strategy used to complete the task. In addition, questions regarding the subject's background were discussed. The purpose of this debriefing was not only to gather information but also to attend to the way in which the subject patterned and presented the information. These data were used to understand how the subject constructed his/her world and the scope of the world in which he/she operated. Stamp's five-level taxonomy of the way in which people arrive at what they know was based on using the card sorting assessment and conducting interviews with 900 managers.

Stamp linked the stages defined in her model with Jaques' strata. (Stamp, 1986) If Stamp's stages are indeed linked to Jaques' strata, then it is possible that her stages also correspond to Jaques and Cason's Complexity of Mental Processing Levels. Stamp's five-level taxonomy is described on the next page. (Stamp, 1981)

Comparison between Jaques' Complexity of Mental Processing Levels and Organizational Strata and Stamp's Taxonomy of Managerial Capability

Jaques' Complexity of Mental Processing Levels and Organizational Strata		Stamp's Levels of Managerial Capability
Declarative Processing	Stratum I 1 Day – 3 Months	Level I: Anchored in the rule. There exists only one possible solution. Tasks are well defined. Ambiguity and uncertainty are screened out. Individuals at this level can work with only one variable at a time. The individual limits the task to the object immediately present before them. The focus of the context in which the task occurs is limited to a local or small scale. Solutions are offered within the perceived rules of the task. This level can be summarized by the phrase "all or nothing."
Cumulative Processing	Stratum II 3 Months – 1 Year	Level II: Action within rule framework. Situations are seen as entities as well as part of a larger field. The individual at this level handles ambiguity by distinguishing between situations. However, determining relationships between strands of possible solutions are not yet evidenced. Consequently, anxiety is centered around eliminating alternatives for fear the solution lies in the discarded information. The phrase describing this level is "either/or."
Serial Processing	Stratum III 1 Year – 2 Years	Level III: Extrapolation from the rule. Options are extrapolated and placed within the context of a closed system. Each component of the solution is linked and every gap is determined to be potentially filled. The individual operating at this level looks for a pattern to connect situations. Ambiguity is a result of the extended context in which the problem occurs; however, it is constrained by the structure of the system. The phrase that captures this level is "given that."
Parallel Processing	Stratum IV 2 Years – 5 Years	Level IV: Patterns emerge from the work Uncertainty arises for two reasons: the context of the problem is conceptual in nature rather than concrete, and judgments will only be able to be assessed after a long period of time has passed. For the first time negative information can be used. An individual successfully operating at this level will consider both sides of an argument. The phrase that represents this level is "let's suppose that on the one hand...and on the other..."
Declarative Processing (at the next Order of Information Complexity)	Stratum V 5 Years – 10 Years	Level V: Redefinition of the rule. Structure is imposed on the problem. Preconceptions are kept to a minimum. What is not known becomes data in and of itself. Negative information is used to temporarily exclude information that is not relevant, though it is recognized that the irrelevant may become relevant. Disorder may be deliberately induced and uncertainty welcomed as a possible source of further information. The importance of the not-known as a possible source of information is often stressed as is the necessity of being sensitive to things which do not happen. Negative information is readily formulated and used. The descriptive phrase for this level it "let's create something."

Table 2 **(Stamp, 1981)**

Rowbottom and Billis

Rowbottom and Billis suggested a descriptive theory of the manifestation of levels within an organizational hierarchy. Their work originated from an action research program which began in 1969 in the new Social Services Departments in Local Authorities (Social Services Organization Research Unit, 1974) in England. Action research is a process whereby a problem is identified, data relevant to the problem is collected, the data is fed back into the system, action is taken based upon the data provided, actions are evaluated, and the evaluation provides an impetus for more data to be collected. (Mink, Shultz, and Mink, 1991)

In their discussion with organization members four reccurring concerns emerged: (1) the organizational position of social work "team leaders" or "seniors" relative to their teams; (2) the organizational position of "home advisors" relative to the residential homes they were supervising; (3) the position of those serving as "specialist advisors," "principal officers," or the equivalent thereof at headquarters relative to social workers in Area Offices; and (4) the position of "deputy directors" relative to "assistant directors." With respect to these positions, there was a great deal of uncertainty as to the extent of their managerial authority. This same uncertainty did not exist for other positions within the organization. (Rowbottom and Billis, 1977)

The formulation of Rowbottom and Billis' theory was based upon Jaques' findings at the Glacier Metal Co. and a year of hypothesis testing and development with groups of senior staff throughout the Social Services System in England. (Rowbottom and Billis, 1977) That is, data was collected regarding how organizational members assumed a system was supposed to work, with respect to the problem under study, and how the organization actually worked, with respect to the problem under study. Questions arose about the necessary organizational mechanisms needed to cope with the problem given the realities of the situation and existing constraints. Discussions then centered around how realistic the changes would be if constraints were removed or weakened. A report compiling the issues was fed back to the group. This process was seen to further clarify the problem and open possibilities for alternative courses of action. (Rowbottom, Hey, and Billis, 1974)

The chart on the next page shows a possible comparison between Jaques' Complexity of Mental Processing and Rowbottom and Billis' perceived qualitative differences between levels in the organization and the resulting increase in responsibility as a person advances in the organizational hierarchy. (Rowbottom and Billis, 1977)

Comparison between Jaques' Complexity of Mental Processing Levels and Findings of Rowbottom and Billis

Jaques' Complexity of Mental Processing Levels	Findings of Rowbottom and Billis
Declarative Processing	Prescribed Output: Objectives, the method for achieving those objectives, and the context in which those objectives are appropriate, are, for all intents and purposes, completely specified.
Cumulative Processing	Situational Response: Each objective is considered in terms of the requirements of the immediate situation. There is no expectation for judgments to be made about situations occurring in the future.
Serial Processing	Systematic Service Provision: Setting up continuous comprehensive services to address current concrete situations. No judgments are expected to be made to budget resources for needs that are not yet realized.
Parallel Processing	Comprehensive Service Provision: Setting up comprehensive services to address the needs within a society defined by location or organization. No judgments are expected to be made to budget resources for future needs.
Declarative Processing at the next Order of Information Complexity	Comprehensive Field Coverage: Setting up comprehensive services to address a field of needs within a society defined by location or organization. No judgments are expected to be made to budget resources for needs occurring outside the field.

Table 3 (Rowbottom and Billis, 1977)

MacDonald

Ian MacDonald constructed a five-stage model illustrating the development of mentally retarded residents as they progress toward independent living. These levels center around a resident's ability to set goals and determine methods to achieve those goals, and the degree of flexibility with which the resident carries that process out. Each successive level requires the resident to operate within a context that increases in scope and in level of abstraction. Jaques' model of

Complexity of Mental Processing, like the MacDonald model, indicates that as one progresses through the developmental stages indicated in the model, the context in which the individual operates becomes broader and the level of abstraction at which an individual can operate increases. The chart below shows a possible comparison between Jaques' Complexity of Mental Processing and MacDonald's five stage model as described.

Comparison between Jaques' Complexity of Mental Processing Levels and MacDonald's Model of Development of the Mentally Retarded

Jaques' Complexity of Mental Processing Levels	MacDonald's Model of Development of the Mentally Retarded
	The resident cannot achieve any goals. The resident is completely dependent on the caretaker.
Declarative Processing	The resident cannot set a goal but can determine a plan to achieve the goal if the caretaker sets the goal.
Cumulative Processing	The resident is able to set a goal and determine a plan to achieve the goal. This is accomplished simultaneously. However there is no flexibility in the goal and method selected.
Serial Processing	The resident is able to set a goal and determine a flexible plan to achieve the goal. The resident can be flexible with the method to achieve the goal.
Parallel Processing	The resident is able to accomplish all skills discussed above. At this level however, not only can the residents set a goal and determine a plan to achieve the goal, residents can substitute one goal for another.

Table 4 (MacDonald, 1978)

Kohlberg

Kohlberg identified a five-stage progression model to describe moral development. Bucy (1988), using Jaques' Complexity of Mental Processing model, conducted research examining the type of reasoning reflected in Kohlberg's Stages

of Moral Development. Bucy found that the stages in Kohlberg's model corresponded to Jaques' model of Complexity of Mental Processing. Jaques (E. Jaques, personal communication, August 15, 2000) argues that shortly before Kohlberg's death, Kohlberg discovered that his developmental theory for moral reasoning did not model morality, but rather modeled cognitive stages of reasoning.

Jaques based his definitions of the four Mental Processes on the way in which an individual combined elements into conceptual categories. Bucy used the terms Shaping, Reflecting, Extrapolating, and Parallel Processing to reflect Jaques' four levels of Mental Processing. Shaping involves using pre-existing sets, but does not indicate the individual elements in the sets, where a set is a conceptual category. Reflecting involves constructing new sets, rather than relying on pre-existing sets. Extrapolating involves the construction of interactive sets. Parallel Processing involves the construction of new sets interacting with elements.

Bucy found that Kohlberg's first stage, Obedience and Punishment, reflects Jaques' Mental Process that Bucy called Shaping. In the Obedience and Punishment stage, rules defining justice are simply given without explanation; they are either accepted or not. Just as in Shaping, Obedience and Punishment requires the use of already existing sets. (Bucy, 1988)

The Instrumental Relativist stage uses Jaques' Mental Process that Bucy called Reflecting. At this level of moral functioning, the individual weighs the

costs and benefits of making a particular moral decision. In the Reflecting mode, this level of moral functioning requires the use of primary sets. Primary sets involve constructing unique sets. A set is considered to be unique if it is composed to resolve a new situation. (Bucy, 1988)

The Interpersonal Concordance stage of moral development reflects Jaques' Jaques' Mental Process that Bucy called Extrapolating. At this level the individual attempts to conform to the expectations of others. Consequently, the individual must try to determine how his or her behavior affects others, and then determine or extrapolate how this reaction affects decision making. This type of reasoning requires the use of interacting primary sets. Interacting primary sets are sets that are in some way interdependent. Reasoning using extrapolation therefore involves the intersection or union of sets. (Bucy, 1988)

The Authority Maintenance stage makes use of Jaques' Mental Process that Bucy also called Parallel Processing. At the Authority Maintenance stage justice is defined in terms of the decision that will maintain rules that serve the interest of an entire system that is composed of a multitude of interests. These different interests must be considered in parallel. The construction of partial secondary sets is necessary for parallel processing to occur. Partial secondary sets are composed both of elements and primary sets. (Bucy, 1988)

Social Contract also reflects the Shaping mode. At this level of moral functioning the individual defines justice in terms of his or her own conscience. As

previously described in the Shaping mode, the rules are just given but at a higher level of abstraction. (Bucy, 1988). On the next page is a chart comparing 5 of Kohlberg's Stages of Moral Development and the types of reasoning required to operate at each of these 5 stages both as defined by Jaques and as researched by Bucy.

Comparison between Jaques' Complexity of Mental Processing Levels and Bucy's Terminology for Mental Processes, and Kohlberg's Stages of Moral Development

Jaques' Complexity of Mental Processing Levels	Bucy's Terminology for Mental Processes	Kohlberg's Stages of Moral Reasoning
Declarative	Shaping	I Obedience and Punishment
Cumulative	Reflecting	II Instrumental Relativist
Serial	Extrapolating	III Interpersonal Concordance
Parallel Processing	Parallel Processing	IV Authority
Declarative	Shaping	V Social Contract

Table 5 (Bucy, 1988, p. 44,104; Jaques, 1994)

Ways of Exploring Organizations

The term "organization" used in the literature rarely distinguishes between types of organizations. Consequently a law firm, the Boyscouts, and a Managerial Hierarchy would all fall into the classification of organization. It is difficult then to be sure to which types of systems the term organization applies. As a result, unless the theory examined specifies the type of organization being described, the term organization will be used without a qualifier.

Jaques' Theory

In those fields in which organization is the focus of study, there seems to be no clearly defined work that relates organizational structure and capability, except Jaques' model. Jaques uses the term organizational structure to mean social structure, i.e., "particular patterns of role relationships in social nets; for example, hierarchical, circular, etc." (Jaques, 1976, p. 25)

Jaques, in discovering strata or managerial layers in an organization, was able to make a distinction between what he calls "surface structure" and "depth structure." Surface structure is defined in terms of its properties; it is "the system or network of connected roles which can be deduced or abstracted by direct observation." (Jaques, 1976) Depth structure is the underpinning that drives the social structure. Jaques postulated that "there exist underlying systems or wholes which can be discovered and which can give explanatory meaning to the world of observation." (Jaques, 1976, p. 42) Jaques' exploration of depth structure revealed different properties at different strata in a managerial hierarchy. This led him to find a relationship between the discontinuous organization strata and Complexity of Mental Processing Levels.

Jaques' study of social structure provides a theoretical basis for distinguishing between different types of organizations. Most of this work has

focused on Managerial Hierarchies in which a CEO is employed to accomplish work through other employees and accountability cascades down the organization.

Structure

The term "structure" in the organizational literature is defined in a variety of ways. Harvey defines structure as "the relationship amongst the various parts of a system" (O.J. Harvey, 1966, p. 40) Gross and Etzioni's definition of structure is "enduring social relationships." (Gross and Etzioni, 1985 p. 65) Mintzberg defines structure as "the sum total of the ways in which its labor is divided into distinct tasks and then its coordination is achieved." Other organizational theorists seem to define structure in terms of its use and function. For example, Galbraith discusses structure in the following way: "The structure of the organization determines the placement of power and authority in the organization. Structure policies fall into four areas: Specialization, Shape, Distribution of Power, and Departmentalization." (Galbraith,1995, p. 13) A chapter in Hall states that structure "demonstrates the 'correlates' of various structural arrangements in organizations... The specific topics to be covered in [the section on structure are] size, complexity and formalization." (Hall, 1972,p. 107-108)

Metaphor

A common method of classifying organizations and organizational theories is through the use of metaphor (Morgan, 1986). These metaphors focus attention on particular aspects of the organization.

Machine Metaphor

The machine metaphor is used to describe those theories that emphasize standardizing components of organization, efficiency, and predictability. Concepts such as unity of command, scalar chain, span of control, division of work, authority, and responsibility form the basis of this thinking. The theories of Fayol, Urwick, and Taylor fall within this category.

Organismic Metaphor

These theorists perceive organizations as living organisms, wherein there is a relationship between molecules, cells, complex organisms species and ecology, Similarly, organismic theorists study the relationship between individuals, groups, organizations, populations of organizations, and social ecology. Organizational theorists who operate out of the organismic tradition tend to structure organizations according to function, and function is driven by survival needs. It is not unusual for organismic theorists to utilize teams to work on complex problems.

Mintzberg is an example of an organismic theorist who emphasized structure. Mintzberg's (1989) work on structure is somewhat atypical of other

descriptions of structure. Rather than defining structure in terms of the interrelationship of roles, Mintzberg defined structure in terms of the direction in which the organization is pulled. He identified five configurations, each representing a different type of structure based on which key part of the organization exerts a pull: Simple Structure, Machine Bureaucracy, Professional Bureaucracy, Divisionalized Form, Adhocracy. (Mintzberg, 1989)

Brain Metaphor

Theorists of the information processing and decision-making approach, theorists of cybernetics, and those who see organizations as learning organizations, and theorists of holographic systems or self-organizing systems understand organizations to function like the brain. In the brain, connectivity takes on increased significance, as well as redundancy of function, and the ability to both specialize and generalize. This approach often leads to attempts to structure a portion of the organization so that it functions like a brain. Corporate planning teams, think tanks, or centralized research and decision-making units are formed to take over thinking for the organization. Organizations trying to emulate the brain usually form teams, led by an individual who acts as a resource, coach and facilitator. Roles are deliberately ambiguous to encourage flexibility. The system is still structured hierarchically, but the hierarchical pattern is emergent rather than imposed. Technology, making possible the rapid distribution of information throughout the organization is a possible tool to replace many of the functions

performed by middle management. These advances are intended to facilitate the flattening of the hierarchy.

Political Metaphor

Organizations can be viewed as political systems, whereby creating and maintaining order occurs through establishing some system of "rule." The type of rule a particular organization adopts, and the power an individual is able to accrue, affects the size of the department and the manager's span of control. Though the organization assumes a hierarchical structure, the political system determines the extent to which order is maintained in the hierarchy.

Psychic Prison Metaphor

Another framework from which to analyze organizations is as a psychic prison. Organizational members are seen to be trapped by their own models of reality, both conscious and unconscious; while organizational structure derives from the mental models held by key decision-makers. Theorists from this school of thought investigate the psychological dynamics underlying role relationships. Hirschorn is a theorist operating within this metaphoric framework.

Domination Metaphor

In understanding an organization as a system of domination, theorists such as Weber and Michels focus on the negative and oppressive effects of organizations

on society. Literature documenting the horrors of hazardous work conditions illustrates evidence for the domination theory.

Weber identified three types of social domination that legitimize authority. Each type of domination is associated with a particular administrative structure.

Charismatic domination, made possible by a leader's personal attributes, legitimized authority through faith by followers, wherein a loose structure is dominated by a few disciples.

Traditional domination is made possible by respect for tradition and the past. People inherit power based on custom. Two structures occur with this type of domination, patriarchal and feudal. In a patriarchal structure the ruler is selected by lineage; a set of paid attendants serve the ruler. The feudal system is more loosely coupled. In return for fulfilling specific ruler expectations, independent leaders retain jurisdiction over certain regions.

Rational-legal domination is legitimized by laws, rules, regulations, and procedures. Organization structure often takes the form of a hierarchy where power is concentrated in the hands of a few.

Strata and Time Span of Discretion

Jaques and Cason's model of Complexity of Mental Processing was predicated on Jaques' observations at Glacier Metal Company of Time-Span of

Discretion and Strata. Time Span of Discretion is the "longest period which can elapse in a role before the manager can be sure that his subordinate has not been exercising marginally sub-standard discretion continuously in balancing the pace and the quality of his work." (Jaques, 1971, p. 17) Jaques hypothesizes that Time-Span of Discretion indicates the level of complexity of work in a role. Strata are the managerial layers in a Managerial Accountability Hierarchy that are characterized by work that falls within a specified range of complexity.

Jaques initially was invited by the CEO of Glacier Metal Company to assist with workplace democracy issues. It was during this endeavor that trade unionists requested Jaques' assistance, quite independent from the work he was doing for the CEO. The problems they posed to Jaques were: Why do some jobs get paid at higher levels than others? What exactly is the job anyway?

Jaques undertook a two-year search to understand the nature of the job. That two-year search led Jaques to make the distinctions between work, task, and role. He determined that *work* is "the exercise of judgment and discretion in making decisions in carrying out goal directed activities." (Jaques, 1996. p. 13) *Task* is "an assignment to produce specified output (including quantity and quality) within a targeted completion time, with allocated resources and within specified limits (policies, procedures, etc.)" or in short form "what by when." (Jaques, 1996. p. 13) *Role* is the position occupied in the Managerial Hierarchy. (Jaques, 1996. p. 13)

After understanding the nature of the job (work, task, role), Jaques was still exploring the question of why one "job" was paid more than another. Three trade unionists came to him with an insight. Employees at the shop level got paid by the piece, employees a little higher up in the hierarchy got paid by the hour, still a little higher up got paid by the month, etc. Thus, the higher up in the hierarchy the role, the greater the length of time in which pay was stated.

Jaques was able to put together the insight the trade unionists made about the way in which pay was stated and his definition of task as a "what by when" to hypothesize that the length of task was related to the level of work in a role. This led to the development of the Time-Span of Discretion instrument.

During this period Jaques was conducting employee interviews at a variety of levels in the organization. During these interviews, employees would complain of managers who were "breathing down their necks". Still other employees felt their managers were too distant. Because Jaques now had his Time-Span of Discretion instrument, he recognized that those employees who felt their managers were too close fell within specific Time-Span ranges relative to their managers. Those employees who felt their managers were too distant fell within a different set of Time-Span ranges relative to their managers. Those employees who seemed to have comfortable relationships with their managers fell within yet a different set of Time-Span ranges relative to their managers. (E. Jaques, personal communication, October 7, 2000) The range of complexity of the work and the common Time

Horizons characterize the various strata. Strata are the structural foundation of Managerial Hierarchies. (Jaques, 2000)

These strata delineate clear cut boundaries. The ranges within these boundaries which represent the range of work as measured by the Time-Span of Discretion instrument are: 1 day to 3 months, 3 months to 1 year, 1 year to 2 years, 2 years to 5 years, 5 years to 10 years, and 10 years to 20 years.

Jaques now knew that these strata existed but he did not yet understand why these discontinuities existed. Just as H^2O has different discontinuous states (solid, liquid, and vapor), Jaques hypothesized that the discontinuities in strata reflected different states in people.

Twenty eight years later, while listening to a set of arguments, Jaques recognized that there were differences in the ways people put arguments together. One woman argued her position by presenting a set of unrelated reasons. Another provided an accumulation of reasons. And yet another argued his position using cause and effect ,or A leads to B which leads to C.

Prior to these observations, Jaques had noted there was a qualitative difference between assignments delegated at each of the strata. For example, stratum one consisted of overcoming obstacles. An assignment given to an employee at stratum one would include an explanation of what to do, how to do it, which problems were to be expected, and how to deal with the problems. If the problem could not be solved, a directive was given that the employee should go to

his or her manager. At stratum two however, an employee was expected to anticipate trouble. Assignments at stratum two were diagnostic. Qualitative differences in task assignment exist between each successive stratum.

Jaques then coupled these three observations: (1) Employees complained of feeling the manager was too close if the manager resided in the same stratum as the employee, or too far if the manager was two or more strata above the employee. (2) The work at one stratum differed qualitatively from the work in another stratum. (3) Arguments were constructed in one of four ways, reoccurring at higher and higher Orders of Information Complexity. These earlier observations noted that the orders of information were chunked in only four ways, at higher and higher levels of complexity. (Jaques now identifies five Orders of Information Complexity).

The similarities in the discontinuous nature of the strata, the task assignment, and the argumentation was striking.

Having detected these similarities, Jaques and Cason conducted a study to test the following hypotheses: (1) there are patterns of Mental Processing that are readily and reliably observable (2) there are Orders of Information Complexity (3) the patterns of Mental Processes and the Orders of Information Complexity are recursive and hierarchical and (4) there is a one-to-one correspondence between strata and Complexity of Mental Processing levels.

For each subject in this study, the subject, the manager, and the manager-once-removed were asked: "If X were in a role with work that he or she really valued doing and had had the opportunity to gain the necessary knowledge and experience for the work, at what stratum (organizational layer) do you judge X would be capable of working at present?" (Jaques and Cason, 1994, p. 45), where X was the subject.

Correlations of judgments of the stratum of X made between the manager-once-removed and the subject were .96, between the manager-once-removed and the manager were .94 and between the manager and the subject were .95. These correlations provided strong evidence that the judgments of the stratum at which the subject was judged to be capable of working were internally consistent. (Jaques and Cason, 1994)

And yet, the most important finding, and strongest relationship, was a correlation of .97 between the judgments of subjects' strata and Complexity of Mental Processing levels. Consequently all individuals capable of functioning at stratum one were found to be capable of Declarative Processing at the Classes Order of Information Complexity. All individuals capable of functioning at stratum two were found to be capable of Cumulative Processing at the Classes Order of Information Complexity. All individuals capable of functioning at stratum three were found to be capable of Serial Processing at the Classes Order of Information Complexity. All individuals capable of functioning at stratum four

were found to be capable of Parallel Processing at the Classes Order of Information Complexity. All individuals capable of functioning at Stratum five were found to be capable of Declarative Processing at the Conceptual Abstract Order of Information Complexity. All individuals capable of functioning at stratum six were found to be capable of Cumulative Processing at the Conceptual Abstract Order of Information Complexity. All individuals capable of functioning at stratum seven were found to be capable of Serial Processing at the Conceptual Abstract Order of Information Complexity. Finally, all individuals capable of functioning at stratum eight were found to be capable of Parallel Processing at the Conceptual Abstract Order of Information Complexity.

The Relationship Between Jaques' Strata and Complexity of Mental Processing Levels

Strata	Complexity of Mental Processing Level
Stratum Eight	Conceptual Abstract Order of Information Complexity Parallel Processing
Stratum Seven	Conceptual Abstract Order of Information Complexity Serial Processing
Stratum Six	Conceptual Abstract Order of Information Complexity Cumulative Processing
Stratum Five	Conceptual Abstract Order of Information Complexity Declarative Processing
Stratum Four	Classes Order of Information Complexity Parallel Processing
Stratum Three	Classes Order of Information Complexity Serial Processing
Stratum Two	Classes Order of Information Complexity Cumulative Processing
Stratum One	Classes Order of Information Complexity Declarative Processing

Table 6 (Adapted from Jaques and Cason, 1994, p. 56)

As is apparent from Table 6, Jaques and Cason's study provides strong evidence for a one-to-one correspondence between stratum and Complexity of Mental Processing level.

Time -Span of Discretion

Time-Span of Discretion is an instrument that can be used to assess the roles in a Managerial Hierarchy and the level of work delegated to each role. The level of work is the weight of responsibility, or the burden someone experiences before a task is completed. Time-Span of Discretion is a property of the role.

Jaques identifies two types of roles present in Managerial Accountability Hierarchies that are relevant when determining Time-Span of Discretion: single-task roles and multiple-task roles. A single-task role is one in which the manager assigns the subordinate a task and waits until the task is completed before assigning another task. For multiple-task roles, the manager assigns the subordinate more than one task at the same time; it is the subordinate's responsibility to see that each task progresses and meets quality standards in the given time allotted to complete the task.

In determining the Time-Span measurement of a role, a distinction must be made between general responsibility and task. General responsibilities are the parameters prescribed by a manager outlining the conditions under which a task must be performed. General responsibilities are not limited in time but rather are

contingent upon conditions. Examples of general responsibilities would be "When talking to customers, be courteous." Or "When a new employee begins working with you, make sure he or she is trained in the new machinery." A task on the other hand is constrained by time; a task has a deadline. Time-Span measures the tasks for a role, not general responsibilities. (Evans, 1978)

By determining the various lengths of tasks assigned to a given role, the Time-Span measurement yields the Time-Span of Discretion of the role. Time-Span of Discretion is the "longest of the maximum-target-completion-times of tasks in the role" (Jaques, 1996, p. 37), which Jaques hypothesizes indicates the level of work of the role. The longer the Time-Span of Discretion of a role, the greater the felt weight of responsibility and therefore the greater the level of work, regardless of the job title. Jaques has found that this result holds true in 15 different countries. (Jaques, 1996)

While Time-Span of Discretion is the measure of the level of work in a role, Time Horizon is the metric used to measure Potential Capability of an individual. Potential Capability is the maximum level of work an individual can competently carry out at the present time, if he or she values the work and has the necessary skilled knowledge. (Jaques, 1996, Glossary)

There is a relationship between the Time Horizon of the individual and his or her Complexity of Mental Processing level. Thus individuals with the same Time Horizon would possess the same Complexity of Mental Processing Level.

Other Studies Using Time-Span of Discretion

Gould (1985a) assessed the level of work in four academic library technical services departments using an intensive interview to elicit the Time-Span of Discretion of each job. Gould concluded that Time-Span of Discretion did yield an objective measure of the managers' subjective judgment of the level of work necessary for each role.

Goodman (1967) purported to examine the relationship between Time-Span of Discretion and the level in an organization. However, Goodman defined Time-Span of Discretion in terms of two concepts: Time Extension and Time Value Orientation. Time Extension was operationalized as the average score on a seven-item Likert scale which refered to how far into the future an individual can conceptualize. Time Value Orientation was operationalized by a fourteen-item Likert scale indicating the value placed on the future relative to the present. Goodman's findings indicate (1) a low correlation between the executives' Time-Span, as measured by Time Extension and Time Value Orientation, and level in the organization ($r=.32$ and $r=.47$ respectively); (2) a low correlation between individual Time-Span as measured by Time Extension and Time Value Orientation, and job Time-Span as determined by a questionnaire; (3) a low correlation between individual time perspective, as indicated by the Time Value Orientation measure, and job Time-Span; (4) a low relationship between Time-Span, level of abstraction (determined by the percentage of time a person spent planning activities

relative to doing activities, as well as taking into consideration the nature of the task) and job Time-Span; (5) a low correlation between job Time-Span and individual Time -span; (6) when job Time-Span and individual Time-Span were consistent, there was greater job satisfaction; (7) there is no difference in job satisfaction scores when an job Time-Span is greater than individual Time-Span. (Goodman, 1967)

Given Goodman's use of the term Time-Span of Discretion, his results could be construed to contradict some of Jaques' findings. However, a direct comparison between Goodman's and Jaques' work is not practicable. Jaques and Goodman conducted their research using distinctly different instruments. Goodman's instrumentation included Time Extension and Time Value Orientation. Time Extension assesses possible events and Time Value Orientation assesses the degree to which the subject would like to adopt specific behavior patterns relative to others. Jaques' instrument, Time-Span of Discretion, assesses objectively measurable events; Time-Span interviews are based on the actual work assigned in a particular role. Goodman asks the subject to assess his or her own Time-Span. Jaques, (Jaques, 1996) on the other hand, interviews the manager, the manager-once-removed, and the subordinate to obtain Time-Span measurements. The manager's interview is critical to obtaining an accurate measurement.

CHAPTER 3
METHODOLOGY

The purpose of this study is to determine if mental complexity is a factor in the election of Presidents of the United States. Specifically, is the presidential candidate with the highest mental complexity elected President by United States citizens who participate in the general presidential election process?

Therefore this study reflects a qualitative inquiry into the nature of the content of existing debate transcripts. The triangular process included a review of the debate transcripts that exhibited the highest levels of complexity of mental processing by each of the candidates. Experts included Dr. Jaques, Ms. Cason, and Dr. Mehltretter, a consultant who uses Requisite Organization in his practice.

Sample

The subject sample selected for this study was United States presidential candidates who participated in public debates where transcripts of the debates were easily accessible.

The sampling technique used for this study was convenience sampling. The data collected on the debates were transcripts of those presidential debates posted on the Internet under the Commission on Presidential Debates or the New York Times, as well as one set of transcribed debates in a book (Holzer, Harold. The Lincoln Douglas Debates. [1993]).

The total number of debates analyzed was 34. Twenty Nine (29) were presidential debates, five (5) were vice-presidential debates. The total number of pages of transcription analyzed for the presidential debates was 888. The total number of pages of transcription analyzed for the vice-presidential debates was 136. A page with less than half of a page filled was not included in the count. All material was single spaced.

The total number of debates per presidential candidate examined are shown in the chart below.

Debate Transcripts per Presidential Candidates

Presidential Candidate	Number of Debates in which Candidate Participated	Number of Pages of Debate Transcripts Per Candidate
Anderson, John	1	16
Bush, George	3	136
Bush, George W.	3	110
Carter, Jimmy	4	87
Clinton, Bill	4	140
Dole, Bob	2	43
Douglas, Stephen A.	7	361
Dukakis, Michael	2	39
Ford, Gerald	3	63
Gore, Albert	3	110
Kennedy, John F.	4	97
Lincoln, Abraham	7	361
Nixon, Richard	4	97
Perot, Ross	3	97
Reagan, Ronald	2	40

Table 7

Debate Transcripts per Vice-Presidential Candidates

Vice-Presidential Candidates	Number of Debates in which Candidate Participated	Number of Pages of Debate Transcripts Per Candidate
Bentsen, Lloyd	1	23
Bush, George	1	22
Cheney, Dick	1	32
Ferraro, Geraldine	1	22
Gore, Albert	2	58
Kemp, Jack	1	21
Leiberman, Joe	1	32
Quayle, Dan	2	60
Stockdale, James	1	37

Table 8

Debate Transcripts per Presidential Primary Candidates

Presidential Primary Candidates	Number of Debates in which Candidate Participated	Number of Pages of Debate Transcripts Per Candidate
Bradley, Bill	1	23
Bush, George W	1	38
Forbes, Steve	1	38
Gore, Albert	1	23
Hatch, Orrin	1	38
Keyes, Alan	1	38
McCain, John	1	38

Table 9

Conceptual Framework

Complexity of Mental Processing is a model that indicates the size and scope of the world in which one can analyze, interpret, model, and fully participate. There are two components to Complexity of Mental Processing: Orders of Information Complexity and Mental Processing level.

Orders of Information Complexity is a taxonomy used to categorize information according to its level of abstraction and its complexity, or the number of variables, rate of change, and ease in identifying the variables. On the following page, the five orders are listed from least to most complex. (See Glossary)

Orders of Information Complexity:

1. Self Explanatory Gesture
2. Specifics
3. Classes
4. Conceptual Abstract
5. Universals

The other component, Mental Processing levels, indicates the way in which people group and compare information. Below, the four processes are listed in order of their use in handling complexity, from least to most complex. (See Glossary)

Mental Processes

1. Declarative
2. Cumulative
3. Serial

4. Parallel

While Mental Processing levels indicate *how* ideas are related, Orders of Information Complexity indicate the complexity of the "*what*," or the complexity of the content that is discussed. Mental Processing levels are recursive, in that the progression of the four Mental Processing levels (Declarative, Cumulative, Serial, and Parallel) can be found within each of the Orders of Information Complexity.

While Jaques identified five Orders of Information Complexity, only two Orders of Information Complexity were applicable to this study, Classes and Conceptual Abstract.

Information is expressed at the Classes level using words as symbols to refer to tangible objects that are not present in the environment. Information is expressed at the Conceptual Abstract level using words as symbols to refer to other words, which then refer to tangible objects.

Concepts and Classes

There are words or word combinations that are constructs, that by their very definition are abstract. Despite the fact that these words are defined as abstract and would be categorized at the Conceptual Abstract level, there are individuals who concretize these words. This is done by reframing the concept of these words or attending to only specific attributes of the concept. Concretizing abstract concepts is a method of reducing complexity.

Consider how you use the word "energy". Energy, as it is used by physicists, is at the Conceptual Abstract Level and would be defined as a scalar quality which describes the state of the system. (Herman Matthews, Ph.D.). Energy is not a tangible entity. The words do not directly refer to some physical object. Energy is determined by examining indicators, which when combined in certain ways, give you a specific representation of the state of a system.

Individuals who operate at the Classes level reduce the concept of energy such that it will describe a tangible entity. While there are probably many ways to concretize a concept, two examples will be discussed.

1. Reframing

   Energy can be written as a mathematical formula. In the case of an ideal system in a gravitational field E = the sum of the Potential Energy plus the Kinetic Energy.

An individual operating at the Classes level could work the equation and derive a number. However, that number would become an end in itself and become synonymous with the concept "energy."

2. Attending to Specific Characteristics or Indicators

    a. People talk about feeling the energy when an oven is turned on. That feeling however is not energy itself but an indicator of energy, which is temperature.

    b. People talk of a light bulb having high and low energy. However it is the luminosity of a bulb, a characteristic of energy, and not energy itself, which is being attended to.

A person at the Classes level sees energy as temperature or luminosity, not as a scalar quantity. Thus, energy is a symbol used to refer to a tangible entity, something that can be seen or felt. (Note that in this example temperature and luminosity are concretized.) Thus, words or word combinations that are defined abstractly may be used by individuals operating at the Classes level, simply by concretizing the concept.

The converse may also be true. Word or word combinations that are defined at the Classes level may be used abstractly by individuals operating at the Conceptual Abstract Level.

Take the following sentence. "Ultimately the bottom line is to put meat on the table." In most instances this word combination would be an expression categorized at the Classes level. Meat refers to food that is a tangible entity.

However, these words were spoken by a rancher to describe an aspect of the ranching business. In particular, the rancher was explaining how he evaluated a bull. He discussed how he must consider primarily the bull's genetics and the environment (i.e. climate) in which the bull resides. He further emphasized that one must sometimes accept less than the desired genetic qualities because of unfavorable environmental conditions. The rancher also spoke of the various check-points in place to assess the quality of the bull. At any of the check-points a bull could receive a negative evaluation, but it was not until five years had elapsed that he could determine that the bull met quality standards. This five-year evaluation of a bull was part of a 10-year business plan. "But ultimately the bottom line is to put meat on the table." So in relation to his original statement, "Meat on the table" was used as an abstract concept that drives the various systems in his ranching operation. His use of "meat on the table" is at a different Order of Information Complexity than simply referring to the actual physical piece of meat that is bought by a consumer at the store.

Examples of Classes and Conceptual Abstract Orders of Information Complexity

The following examples are provided to elucidate the distinction between information expressed at the Classes level and information expressed at the Conceptual Abstract level.

Example 1: Consider the word "inflation." The following is an example of inflation used at the Classes level:

> Mr. Movers, in addition to saying that this is no time for a tax cut, in view of the incipient signs of renewed **inflation**, in addition to calling for restraint in Federal spending, 15 months ago, I also suggested we ought to have an emergency excise tax on gasoline. I say that because I think, this year, we will send $90 billion out of this country to pay for imported oil, even though that, those imports have been reduced. And since I first made that proposal 15 months ago, the price of gasoline, which was then $.80, has gone up to about $1.30. In other words, we've had a huge increase of about $.50 a gallon since that time, and all of that increase has gone out of this country – or much of it – into the pockets of the American workers by reducing their tax payments, their Social Security tax payments by 50%. That, I think, in addition, would be an anti-inflationary measure that would strengthen the economy of this county. (Transcripts of the Presidential Debate: September 21, 1980)

Inflation in this context actually refers to the price of gasoline. Thus, inflation is a word used as a symbol to refer to a tangible entity.

Take the same word "inflation" and consider its use in the following context.

> I believe that the only unpopular measures, actually, that could be or would be applied, would be unpopular with the government, and with those, perhaps, some special interest groups who are tied closely to government. I believe that **inflation** today is caused by government simply spending more than government takes in, at the same time that government has imposed upon business and industry, from

the shopkeeper on the corner to the biggest industrial plant in America, countless harassing regulations and punitive taxes that have reduced productivity at the same time they have increased the cost of production. And when you are reducing productivity at the same time that you are turning out printing press money in excessive amounts, you're causing inflation. And it isn't really higher prices, it's just you are reducing the value of the money. You are robbing the American people of their savings. And so, the plan that I have proposed-and contrary to what John says, my plan is for a phased-in tax cut over a three-year period, tax increase and depreciation allowances for business and industry to give them the capital to refurbish plant and equipment, research and development, improved technology all of which we see our foreign competitors having, and we have the greatest percentage of outmoded industrial plant and equipment of any of the industrial nations produce more, have stable money supply, and give the people of this country a greater share of their own savings.

Now I know that his has been called **inflationary** by my opponent and by the man who isn't here tonight. But I don't see where it is inflationary to have people keep more of their earnings and spend it, and it isn't inflationary for government to take that money away from them and spend it on the things it wants to spend it on. I believe we need incentive for the individual and for business and industry, and I believe the plan that I have submitted, with detailed backing, and which has been approved by a number of our leading economists in the country, is based on projections. Conservative projections out for the next five years, that indicates that this plan would, by 1983, result in a balanced budget. We have to remember, when we talk a tax cut, we're only talking about reducing a tax increase, because this Administration has left us with a built-in tax increase that will amount to $86 billion next year." (Transcript of the Presidential Debate: September 21, 1980)

In the context illustrated above, inflation is a symbol that refers to other words used as symbols (i.e. the variables listed) which then refers to the reduction

of the value of money. Thus, inflation in this example is used at the Conceptual Abstract level.

In this second example, inflation is caused by the way in which certain variables interact and are manipulated; the variables being government spending, regulations, taxes, production costs, and printing press money.

Example 2: Consider the following discussions on farm subsidies.

> ...The farmer plants in the spring and harvests in the fall. There are hundreds of thousands of them. They really don't – they're not able to control their market very well. They bring their crops in or their livestock in, many of them about the same time. They have only a few purchasers that buy their milk or their hogs – a few large companies in many cases-and therefore the farmer is not in a position to bargain very effectively in the market place. I think the experience of the twenties has shown what a free market could do to agriculture. And if the agricultural economy collapses, then the economy of the rest of the United States sooner or later will collapse. The farmers are the number one market for the automobile industry of the United States. The automobile industry is the number one market for steel. So if the farmers' economy continues to decline as sharply as it has in recent years, then I think you would have a recession in the rest of the country. So I think the case for the government intervention is a good one. Secondly, my objection to present farm policy is that there are no effective controls to bring supply and demand into better balance. The dropping of the support price in order to limit production does not work and we now have the highest uh – surpluses-nine billion dollars worth. We've had a uh – higher tax load from the Treasury for the farmer in the last few years with the lowest farm income in many years. I think that this farm policy has failed. In my judgment the only policy that will work will be for effective supply and demand to be in balance. And that can only be done through governmental action. I therefore suggest that in those basic commodities which are supported, that the federal government, after endorsement by the farmers in that

> commodity, attempt to bring supply and demand into balance – attempt effective production controls – so that we won't have that five or six percent surplus which breaks the price fifteen or twenty percent. I think Mr. Benson's program has failed. And I must say, after reading the Vice President's speech before the farmers, as he read mine, I don't believe that it's very much different from Mr. Benson's. I don't think it provides effective governmental controls. I think the support prices are tied to the average market price of the last three years, which was Mr. Benson's theory. I therefore do not believe that this is a sharp enough breach with the past to give us any hope of success for the future. (Transcripts of Presidential Debates, Sept.26, 1960)

In this example subsidizing the farmer is talked about as a system, where variables are interrelated, and a change in one affects the other.

Take the same term, farm subsidies, and consider its use in the following context.

> The program I have advocated is one which departs from the present program that we have in this respect. It recognized that the government has a responsibility to get the farmer out of the trouble he presently is in because the government got him into it. And that's the fundamental reason why we can't let the farmer go by himself at the present time. The farmer produced these surpluses because the government asked him to through legislation during the war. Now that we have these surpluses, it's our responsibility to indemnify the farmer during that period that we get rid of the farmer uh – surpluses. Until we get the surpluses off the farmer's back, however, we should have a program such as I announced, which will see that farm income holds up. But I would propose holding that income up not through a type of program that Senator Kennedy has suggested that would raise prices, but one that would indemnify the farmer, pay the farmer in kind uh – from the products which are in surplus. (The Presidential Debates, September 26, 1960)

This time the concept of farm subsidies is used at the Classes level. Farm subsidies are seen as a reimbursement due to a governmental policy.

Levels of Mental Processes

All of the four mental processes, declarative, cumulative, serial, and parallel, were found in this study and can be described as follows:

Declarative: A declarative processor puts forth a position by providing a number of unrelated ideas to support the position; each of the ideas cannot stand alone.

Example:

Idea A = Position

Idea B = Position

Idea C = Position

Logic:

A or B or C

An example of declarative processing is the following response to questions posed by the candidate's opponent.

> "I desire to know whether Lincoln today stands as he did in 1854, in favor of the unconditional repeal to the fugitive slave law. To which I answer; I do not now nor ever did stand in favor of the unconditional repeal of the fugitive slave law."
>
> I desire him [the opponent] to answer whether he stands pledged today, as he did in 1854, against the admission of any more slave states into the Union, even if the people want

them. I answer I do not nor ever did stand pledged against the admission of any more slave states into the Union.

I want to know whether he stands pledged against the admission of a new state into the Union with such a constitution as the people of that state may see fit to make. I answer I do not stand pledged against the admission of the people of that state with such a constitution as they may see fit to make.

I want to know whether he stands today pledged to the abolition of slavery in the District of Columbia. I answer, I do not stand today pledged to the abolition of slavery in the District of Columbia.

I desire him to answer whether he stands pledged to the prohibition of the slave trade between the different states. I answer, I do not stand pledged to the prohibition of the slave trade between the different states.

I desire to know whether he stands pledged to prohibit slavery in all the territories of the United States, north as well as south of the Missouri compromise line. I answer, I am impliedly, if not expressly pledged to the belief in the right and duty of congress to prohibit slavery in all the United States territories.

I desire him to answer whether he is opposed to the acquisition of any more territory unless slavery is first prohibited therein.["] I answer, I am not generally opposed to the honest acquisition of territory, and in any given case I would or would not oppose such acquisition, according as I might think such acquisition would or would not aggravate the slavery question among ourselves...(Transcripts of the Presidential Debates, August 27, 1858, p. 92-93)

Cumulative: A Cumulative Processor puts forth a position by providing a number of ideas to support the position. However, in contrast with the Declarative

Processor, each of the ideas cannot stand alone. Instead, the contribution of all the ideas together is used to support the position.

Example:

Idea A + Idea B + Idea C = Position

Logic:

A + B + C

An example of Cumulative Processing is as follows:

> We won the Cold War because we invested in national security. We won the Cold War because we invested in our military. We didn't win the Cold—we won the Cold War because we invested in national security. We won the Cold War because we invested in our military. We didn't win the cold—or we won the Cold War because America had the political will and made the right decisions. Yes, we can make the cuts in defense and we have. Bill Clinton wants to cut defense another $60 billion. I'd say to the defense workers in California and elsewhere, a $60 billion defense cut is going to cut a lot of jobs out.
>
> Yes we are making a conversion and we can go to a civil space rather than having defense—or the defense industry. Well, let me say this: we would not have won the Cold War if we had listened to Senator Gore and his crowd, and had supported a nuclear freeze. If you would have supported that attitude—if you would have supported that attitude, we would not have won the Cold War. We won the Cold War because we invested and we went forward. (Transcripts of the Vice Presidential Debates, October 13, 1992, p.12.)

Serial: A Serial Processor puts forth a position by showing how one idea leads to another idea which leads to another idea. This linking of three or more ideas is called a series.

Example:

Idea A → Idea B → Idea C = Position

Logic

If A then B, If B then C

The following is an example of Serial Processing:

> The tax increase I have proposed triggers in at family incomes of $200,000 and above. Those are the people who in the 1980s had their incomes go up while their taxes went down. Middle-class people, defined as people with incomes of $52,000 and down, had their incomes go down while their taxes went up in the Reagan-Bush years because of 6 increases in the payroll taxes. So that is where my income limit would trigger. (Transcripts of the Presidential Debates October 11, 1992, p. 6)

Parallel: A Parallel Processor puts forth a position by providing a number of series (see above) which are interlinked. Thus, two or more ideas are held in parallel and one conditions the other. This argument is built on interrelationships among a number of series.

Example:

Series 1 Idea A → Idea B → Idea C

Series 2 Idea E → Idea B → Idea D

Series 3 Idea F →Idea B → Idea D → Idea G → Position

Logic:

If A then B, if and only if C then D

The following is an example of Parallel Processing:

> ...I believe that if the federal government spends money, say on the poorest of the poor children, we need to ask a simple question: What are the results? What are the results? Are the children learning? And if they are, we ought to give bonuses to schools for the poorest of the poor. But if they're not—if the poorest of the poor remain in trap schools, that money that would go to the school should go to the parent so the parent gets to make a different choice... (Transcripts of the Presidential Debate, December 6, 1999, p. 3)

Identification Guide to Aid in Complexity of Mental Processing (CMP) Recognition

Glenn Mehltretter of People Fit designed an identification guide to aid in identifying the mental processes. In my work with Glenn Mehltretter over a three-month period, this system was expanded. Below are examples of indicators which help to identify the following Mental Processes

Please note that these indicators act only as cues as well as a starting place, and should not be used as a formula to identify Mental Processes. The analysis must be based on the way in which the argument is constructed, and not on the connecting words used to make the argument.

Declarative Arguments

"Or" or "And" will often identify a declarative argument. Below are examples in which declarative arguments include these two indicators.

OR

> Let me tell you: the media have been wrong before. We have never subsidized any county—**or** any company to move from the US to Latin America. You know full well the Caribbean Basin Initiative, you've supported that. (Transcripts of the Presidential Debate, October 13, 1992, p. 9)

AND

> I think the principal that separates me is that 5 and a half million people came together on their own and put me on the ballot. I was not put on the ballot by either of the 2 parties; I was not put on the ballot by any PAC money, by any foreign lobbyist money, by any special interest money. This is a movement that came from the people. This is the way the framers of the Constitution intended our government to be, a government that comes-from the people. Over time we have developed a government that comes-at the people, that comes from the top down, where the people are more or less treated as objects to be programmed during the campaign with commercials **and** media events **and** fear messages and personal attacks **and** things of that nature. The thing that separates my candidacy and makes it unique is that this came from millions of people in 50 states all over this country who

> wanted a candidate that worked **and** belonged to nobody but them. I go into this race as their servant, **and** I belong to them. So this comes from the people. (Transcripts of the Presidential Debates, October 11, 1992, p. 3)

Cumulative Arguments

"And," "in addition," "again," "also," "but," and "First, Second, Third," often identify Cumulative Arguments. Below are examples of the indicators and how they are used in Cumulative Arguments.

AND

> I'd have confidence in him. **And** I made a good selection. **And** I've never seen such pounding, an unfair pounding, on a young Senator in my entire life. **And** I've never seen a presidential campaign where the presidential nominee runs against my vice presidential nominee; never seen one before. (Transcripts of the Presidential Debates, October 13, 1998, p. 2)

IN ADDITION

> ...My worst behavior on the basketball court, I suppose, was occasionally holding John Hablecick (ph) when I played the Boston Celtics. And actually, I knew I was doing pretty well in New Hampshire about six months into the campaign when some person came up to me and said—gave me a bumper sticker and it said: Another Celtic Fan for Bradley.
> But I also, **in addition** to holding John Halbecick (ph) occasionally, you know, there's a competition that goes on. There are elbows that are thrown. Occasional blows are thrown. That's part of the game... (Transcripts of the Presidential Debate, January 26, 2000, p. 13)

AGAIN

Well, as I said before, he used much harsher language when he talked about Bob Dole. He said that Bob Dole's solution for every single problem was to increase taxes. He said just two years ago that the Bob Dole tax increase of 1982 was the largest tax increase in the world, but let's get to the point. Medicare has been adjusted 23 times since it was created in 1965. Bob Dole, incidentally, just bragged this year that he was one of only 12 people who voted against the creation of Medicare in the first place. I don't think he's—he didn't believe in it then, and the plan that he promoted last year would have certainly been devastating to Medicare. **Again,** don't take my word for it. The American Hospital Association said it could have closed 700 hospitals. The Catholic Health Association, the AARP, and many other groups who pay careful attention to Medicare said that the Dole/Gingrich plan on Medicare would have led to deep cuts, possibly set up a two-tiered system, and would have ended the kind of Medicare system that we have. Our plan extends Medicare ten years into the future. We will always protect Medicare within the context of a balanced budget plan. (Transcripts of the Vice Presidential Debates, October 9, 1996)

ALSO

You're absolutely right, Judy. All parents deserve time and all parents should have the opportunity to spend more time with their children. But credits from Washington, raiding unemployment funds is not going to do the job.

The real way you give parents freedom is first let them keep more of what they earn in the first place. They shouldn't have to have an accountant to figure out what tax credits they qualify for. They should have it in their paycheck.

Also too, I believe that as Alan and others have pointed out, we need to have parents have control of the schools so that they can go to schools where schools can have flexibility in terms of the time the children spend there.

So the combination of genuine tax reform, where parents can make quality of life decisions, allowing parents to choose schools that work best for their children—that's the way to move forward instead of micromanaging with credits from Washington, D.C. Trust us, not Washington. (Transcripts of the Presidential Debates, December 6, 1999)

BUT

Well, here again, uh-the Panamanian question is one that's been confused by Mr. Ford. Uh-he had directed his uh-diplomatic relation uh- uh- representative to yield to the Panamanians full sovereignty over the Panama Canal Zone at the end of a certain period of time. When Mr. Reagan raised this uh-question in Florida uh-Mr. Ford not only disavowed his instructions, **but** he also even dropped, parenthetically, the use of the word "détente." I would never give up complete control or practical control of the Panama Canal Zone, **but** I would continue to negotiate with the Panamanians. When the original treaty was signed back in the early 1900s, when Theodore Roosevelt was president, Panama retained sovereignty over the Panama Canal Zone. We retained control as though we had sovereignty. Now I would be willing to go ahead with negotiations. I believe that we could share more fully responsibilities for the Panama Canal Zone with Panama. I would be willing to continue to raise the payment for shipment of goods through the Panama Canal Zone. I might even be willing to reduce to some degree our military emplacements in the Panama Canal Zone, **but** I would not relinquish practical control of the Panama Canal Zone any time in the foreseeable future. (Transcripts of the Presidential Debate, September 23, 1976, p. 15)

FIRST, SECOND, THIRD

Like Mr. Perot, I have held crack babies in my arms. But I know more about this, I think, than anybody else up here because I have a brother who's a recovering drug addict. I'm very proud of him.

> But I can tell you this. If drugs were legal, I don't think he'd be alive today. I am adamantly opposed to legalizing drugs. He is alive today because of the criminal justice system. That's a mistake. What should we do? **First**, we ought to prevent more of this on the street. Thirty years ago, there were three policemen for every crime. Now there are three crimes for every policeman. We need a hundred thousand more police on the street. I have a plan for that.
>
> **Secondly**, we ought to have treatment on demand.
>
> **Thirdly**, we ought to have boot camps for first-time nonviolent offenders so they can get discipline and treatment and education and get reconnected to the community before they're severed and sent to prison, where they can learn how to be first class criminals.
>
> There is a crime bill that lamentably, was blocked from passage once again, mostly by Republicans in the US Senate, which would have addressed some of these problems. That crime bill is going to be one of my highest priorities next January if I become president. (Transcripts of the Presidential Debates, October 11, 1992, p. 5)

Serial Arguments

"If," "then," "therefore," "because," "so," "in order to," "which," and "why" are indicators of serial arguments. Below are examples of serial arguments in which the indicators were utilized.

IF

> ...Let me tell you why this is so important. There are millions of women in this country who passionately believe in the right of a woman to privacy. And they want to stack the Supreme Court with justices who will take away the right to privacy. Make no mistake about it. That is their agenda.
>
> And **if** you support them, don't be surprised **if** that is exactly what they want to do and that is why Dan Quayle refuses to say this evening that he supports the right of a woman to choose... (Transcripts of Vice Presidential Debates, October 13, 1992, p. 28)

THEN

> ...But I want to return and say one more time; you have used our tax dollars to subsidize the recruitment of US companies to move overseas and throw Americans out of work. In Decaturville, Tennessee, not very far from my home, a factory was shut down right there when they were solicited by officials paid with US taxpayers' money, and **then** the replacement workers in a foreign country were trained with our tax dollars and **then** their imports were subsidized coming back into the US...(Transcripts of the Vice Presidential Debate, October 13, 1992, p. 10)

BECAUSE

> The tax increase I have proposed triggers in at family incomes of $200,000 and above. Those are the people who in the 1980s had their incomes go up while their taxes went down. Middle-class people, defined as people with incomes of $52,000 and down, had their incomes go down while their taxes went up in the Reagan-Bush years **because** of 6 increases in the payroll taxes. So that is where my income limit would trigger. (Transcripts of the Presidential Debate [First Half of Debate], October 11, 1992, p. 6)

SO

> This morning I was in Manchester at the Y, at an early child care program. The first three years of life are decisive in terms of early brain formation. That's why I think you begin investing in education in those first three or four years. I think then it's important to increase the Head Start slots by 400,000, because that prepares kids to go to school.
>
> And then I think it's very important to—when you get to elementary and secondary, that the biggest thing that the federal government can do in the next decade, is to try to put 600,000 new, qualified teachers in classrooms in this country, and 2,000 after-school programs for kids, **so** between 3:00 and 8:00 they have someplace to go.
>
> Then a major investment in community colleges, and more funding for special education, which would reduce the property tax burden on

New Hampshire property tax payers. (Transcripts of the Presidential Debates, January 26, 2000, p. 3)

IN ORDER TO

Governor Carter skims over a very serious and very broad subject. In January of uh-1975 I submitted to the Congress and to the American people the first comprehensive energy program recommended by any president. It called for an increase in the production of energy in the United States. It called for uh-conservation measures so that we would save the energy that we have. If you're going to increase domestic oil and gas production-and we have to-you have to give those producers an opportunity to uh-develop their land or their wells. I recommended to the Congress that we should increase production in this country from six hundred million tons a year to twelve billion two hundred million tons by 1985. **In order to** do that we have to improve our extraction of coal from the ground; we have to improve our utilization of coal-make it more efficient, make it cleaner... (Transcripts of the Presidential Debate: September 23, 1976, pp.12-13)

WHY

One of the reasons, and I first would like to know which programs you're talking about, and then we could talk on the merits of the programs. But, you see, my fundamental philosophy is give local and state government as much control as possible. That might be the explanation, if you tell me the program. I do strongly support the WIC program. I think it is good. I think part of the answer to this haunting of these children that are out there and suffering lies in extension of Medicaid to challenge the states, and maybe we're going to have to enforce more on the states in terms of Medicaid taking care of these. But, Peter, so much of it is, gets into a whole other phase of things. The neighborhood, the kind of environment people are growing up in, and that leads me to the programs I'm talking about in terms of education. I think that part of it is the crime infested neighborhoods, and that's **why** I'm a strong believer in trying to control crimes in the neighborhood, **why** I was so pleased to be endorsed by the policemen on the beat, the Boston Police Department the other day. I think they understand my commitment to helping

them in the neighborhoods. And so it's a combination of these things. But do not erode out of the system the thousand points of light. The people that are out there trying to help these kids, the programs like cities and schools, the work that Barbara Bush is doing so people can learn to read in this country and then go on and break this cycle of poverty. I'm for Head Start and moving that up. And I've already made a proposal-and yes, it will cost some money. But I favor that. So these are the combination of things I want, and the fact that I don't think the federal government can endorse a $35 billion program does not mean I have less compassion than the person who endorses such a program. (Transcripts of the Presidential Debates, September 25, 1988, p. 13)

WHICH

Let me say this about AIDS. It's the single most important public health crisis, single most important public health emergency we've had in our lifetimes and I think there are a number of things we have to do including supporting legislation which is now moving through the Congress, **which** will commit this nation to the resources to find a cure which will provide broad education and prevention, **which** will provide sensitive and caring treatment for the victims of AIDS. I think we have to demonstrate some flexibility and I think the FDA is attempting to do so now in trying to make it possible for new and experimental drugs to be available to people who are at risk of AIDS and I would hope that we could bring that kind of a policy to bear beginning in January. And I would encourage the current administration to proceed with that kind of flexibility where it's appropriate and where it's done carefully and responsibly. But we have not had the kind of leadership we should have had. In this particular area, I think the Vice President and I are in general agreement on what we have to do. The special Federal commission made good solid recommendations. I think we're both supportive of them and I would strongly lead in that area as I have in my state as Governor. (Transcripts of the Presidential Debates, September 25, 1988, p. 7)

Parallel Arguments

Multiple series are marked by several "if'" or "if-then" in combination with an if-then series that negates a previous series, using words and phrases such as "against," "at the same time," "versus," "on the other hand" are used to identify arguments in which parallel processing is used. Below are examples of markers used in Parallel Arguments.

MULTIPLE SERIES

> That tax bill does not entirely meet the criteria that I established. I think the Congress should have uh – added another $10 billion reduction in personal income taxes, including the increase of personal exemptions from seven hundred and fifty to a thousand dollars. And Congress could have done that **if** the budget committees of the Congress, and the Congress as a whole, had not increased the spending that I recommended in the budget. I'm sure that you know that in the resolutions passed by the Congress, that have added about $17 billion in more spending, by the Congress over the budget that I recommended. So I would prefer in that tax bill to have an additional tax cut and a further limitation on federal spending. Now this tax bill- hasn't reached the White House yet, but is expected in a day or two – its about fifteen hundred pages. It has some good provisions in it. It has – uh left -out some that I have recommended unfortunately. **On the other hand**, uh when you have a bill of that magnitude, with –tho-those many provisions, a president has to sit and decide **if** there's more good than bad. And from the a- analysis that I've made so far, it seems to me that that tax bill does uh-justify my signature and my approval. (Transcripts of the Presidential Debates, September 23, 1976, p. 4)

Procedures for Analysis

The following procedure was used for analyzing the presidential and vice-presidential debate transcripts.

1) Read one debate all the way through to get a "feel" for the Complexity of Mental Processing level.
2) Read the selection again to determine how the basic argument is linked together. Circle key words that indicate linkages (i.e.: or, and, if, then, but, etc.)
3) Determine if serial processing is present. If serial processing is not present, determine whether the argument is declarative or cumulative. If the reasons are unrelated, it is declarative. If the argument is based on an accumulation of reasons, often indicated by an "and" or "but," the argument is cumulative.
4) If the argument is a serial argument, place numbers in front of each series.
5) Determine whether the serial argument simply stands as one or more independent series, or if it is an argument using parallel processing. If no topics are interlinked in two or more of the series, the argument stands as a serial argument. If a topic is interlinked in more than one series, parallel processing is being used.
6) Read through the debates again to determine the Order of Information Complexity. Consider the following questions: Is the content addressing

classes of things? Does the content lead directly back to a tangible object, or is the content one step removed from the tangible? Does the speaker concretize the concepts being used? Is a concrete example of the concept provided?

7) Identify the Complexity of Information Processing level.
8) Discuss sections of the debate containing the highest Complexity of Information Processing levels with an independent person who has some familiarity with the model of Complexity of Mental Processing.
9) Discuss the sections of the debate containing the highest Complexity of Mental Processing Levels with an expert in the Complexity of Mental Processing model.
10) Make a final judgment of each candidate's Complexity of Mental Processing level.
11) Have the data validated by an expert in the Complexity of Mental Processing model.

CHAPTER 4
RESULTS AND DISCUSSION

The basic question: Is mental complexity a factor in the election of Presidents of the United States?

Specifically: Is the presidential candidate with the highest Complexity of Mental level elected President by United States citizens who participate in the general presidential election process?

Results

Using Jaques' model of Complexity of Mental Processing, seven elections were examined. Transcripts from presidential debates were analyzed to determine each presidential candidate's Complexity of Mental Processing level. In five cases, the candidates who were members of a major party and who demonstrated the highest Complexity of Mental Processing levels in the debates won the election. In the other two elections, the competing candidates demonstrated the same Complexity of Mental Processing level in the presidential debates.

Election Results

Election Year	Candidate with the Highest Complexity of Mental Processing Level Won
1858	yes
1960	yes
1976	tie*
1980	yes
1988	yes
1992	tie*
1996	yes

Table 10

***Competing candidates demonstrated the same Complexity of Mental Processing level in the presidential debates.**

There were two other significant results:

1. In 1976, both candidates demonstrated the same mental complexity in the debates. The candidate who won the election was 11 years younger than his opponent. Four years later, when he ran against an opponent who was 13 years older, he lost that election; his opponent in that election demonstrated a higher Complexity of Mental Processing level in the debates.
2. In 1988, the candidate who demonstrated the higher Complexity of Mental Processing level in the debates was elected president. Four years later when he ran against an opponent and both demonstrated the same higher Complexity of Mental Processing level in the debates, he lost that election. The candidate who won was 24 years younger.

Assessment of Presidential Candidates' Complexity of Mental Processing Levels

Presidential Candidate	Number of Debates in which Candidate Participated	Complexity of Mental Processing Level
Anderson, John	1	Conceptual Abstract Declarative Processing
Bush, George	5	Conceptual Abstract Cumulative Processing
Bush, George W.	3	Conceptual Abstract Cumulative Processing
Carter, Jimmy	4	Conceptual Abstract Declarative Processing
Clinton, Bill	4	Conceptual Abstract Cumulative Processing
Dole, Bob	2	Conceptual Abstract Declarative Processing
Douglas, Stephen A.	7	Conceptual Abstract Declarative Processing
Dukakis, Michael	2	Conceptual Abstract; Declarative Processing
Ford, Gerald	3	Conceptual Abstract Declarative Processing
Gore, Albert	3	Conceptual Abstract Cumulative Processing
Kennedy, John F.	4	Conceptual Abstract Serial Processing
Lincoln, Abraham	7	Conceptual Abstract Cumulative Processing
Nixon, Richard	4	Conceptual Abstract Cumulative Processing
Perot, Ross	3	Conceptual Abstract Serial Processing
Reagan, Ronald	2	Conceptual Abstract Serial Processing

Table 11

In addition, the Complexity of Mental Processing levels were obtained for seven vice-presidential candidates. In general, the vice-presidential candidates' Complexity of Mental Processing levels seemed to be lower than their respective presidential candidates' Complexity of Mental Processing levels.

Assessment of Vice Presidential Candidates' Complexity of Mental Processing Levels

Vice-Presidential Candidates	Number of Debates in which Candidates Participated	Complexity of Mental Processing Levels
Bentsen, Lloyd	1	Conceptual Abstract Declarative Processing
Bush, George	1	Conceptual Abstract Cumulative Processing
Cheney, Dick	1	Conceptual Abstract Serial Processing
Ferraro, Geraldine	1	Classes Parallel Processing
Gore, Albert	2	Conceptual Abstract Cumulative Processing
Kemp, Jack	1	Conceptual Abstract Cumulative Processing
Leiberman, Joe	1	Conceptual Abstract Cumulative Processing
Quayle, Dan	2	Classes Serial Processing
Stockdale, James	1	Conceptual Abstract Declarative Processing

Table 12

In addition, data from recent presidential primary election debates were examined. The results were inconclusive.

Assessment of Primary Candidates' Complexity of Mental Processing Levels

Presidential Candidates Running in Primary Elections	Number of Debates in which Candidate Participated	Complexity of Mental Processing Levels
Bauer, Gary	1	Classes Parallel Processing
Bradley, Bill	1	Conceptual Abstract Declarative Processing
Forbes, Steve	1	Classes Parallel Processing
Hatch, Orrin	1	Classes Parallel Processing
Keyes, Alan	1	Conceptual Abstract Declarative Processing
McCain, John	1	Conceptual Abstract Declarative Processing

Table 13

All the results shown in this section were validated by Kathryn Cason.

Discussion

In the data sampled for presidential candidates, it was found, with two exceptions, that there was a difference in Complexity of Mental Processing level between candidates of the major political parties in the United States. In each of these elections, the candidate with the highest Complexity of Mental Processing level displayed in the recorded records of presidential debates won. This result supports the hypothesis that Complexity of Mental Processing level of candidates from the major political parties is a factor in the election of Presidents of the United States.

There were two elections that further supported this hypothesis. Jaques has shown that as people age, their Complexity of Mental Processing increases. (Jaques, 1988) The basic premise of this study is that Complexity of Mental Processing is an indicator of the capability of an individual. In the presidential elections where each candidate had the same Complexity of Mental Processing level, the youngest candidate won. Therefore voters seem to recognize Future Potential Capability. Future Potential Capability is the maximum level at which a person will be capable of working at a designated time in the future.

In 1976, both candidates demonstrated the same Complexity of Mental Processing in the debates. The candidate who won the election was 11 years younger than his opponent. Four years later when he ran against an opponent who was 13 years older, he lost that election. His opponent in that election demonstrated a higher Complexity of Mental Processing level in the debates.

In 1988, the candidate who demonstrated the higher Complexity of Mental Processing in the debates was elected president. Four years later when he ran against an opponent and both demonstrated the same Complexity of Mental Processing in the debates, he lost that election. The candidate who won was 24 years younger.

In summary, in all cases the candidates who won the elections demonstrated the same or higher Complexity of Mental Processing level in the presidential debates as their opponent.

The debates of the presidential candidates for the year 2000 election, were analyzed prior to the election. Both candidates were found to exhibit the same Complexity of Mental Processing level in the debates.

Note that this Dissertation was copyrighted prior to the 2000 presidential election. At the time of this writing, the public opinion polls show neither candidate holds a substantial lead.

While it is true that this study did not take into account such factors such as appearance, style, body language, public dollars, etc., this limited check on the

theory does support the importance of Complexity of Mental Processing level as a factor in the outcomes of presidential elections.

One could argue that the debates are not representative of the candidates' capabilities for two reasons: (1) The debates portray only a fragment of the candidates' activities in the campaign and (2) Presidential candidates have a whole set of advisors who influence the arguments they make publicly, as well as the form of those arguments.

While the presidential debates portray only a fragment of the candidates' activities in the campaign, they do receive widespread media attention, and they are accessible to most of the United States public. From a public perspective, the presidential debates are as close a look the general public will get at the candidates' Complexity of Mental Processing.

While it is also true that advisors of various sorts influence the candidates' messages and delivery of those messages, it appears from performing an analysis of the transcripts that there are times in the debates that the presidential candidates are fully engaged in the response. These instances were often in response to questions where either the candidate was challenged, or where the candidate was responding to a favored issue. In these arguments, the candidates usually demonstrated their highest Complexity of Mental Processing level.

Therefore, using Ockham's Razor, the most plausible explanation for these results would be that United States voters respond to the Complexity of Mental

Processing of the candidates from the major political parties. And, at least part of their choice in selecting a President is Complexity of Mental Processing level.

CHAPTER 5
SUMMARY AND CONCLUSIONS

This chapter provides a summary of the study.

Study Summary

Research Question

Jaques' research of Accountability hierarchy suggests that managers and managers-once-removed recognize the mental complexity of their subordinates and subordinates-once-removed. Jaques' findings suggest this recognition drives the extant or informal structure of an organization.

This study was designed to determine if mental complexity is a factor in the election of Presidents of the United States.

The basic premise of this study is that mental complexity is an indicator of the capability of an individual.

The electoral process was used for the context of the study because large numbers of people participate in the process, a large number of ethnographic factors are represented by the voters, and the election represents a formal

expression of choice by the participants in the process. Therefore the specific question was:

> Question: Is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States citizens who participate in the presidential election process?

Review of the Literature

The research question guided the contents of the literature review.

Complexity of Mental Processing Levels

Jaques and Cason (1994), in their study of Managerial Hierarchies, used Jaques' maturational model, describing the progression of an individual's ability to process complex information. The model, Complexity of Mental Processing, is comprised of two components, Order of Information Complexity and Mental Processing levels. Observation of these two components is made possible during the presentation of an argument or position when a subject is fully engaged in the process.

Developmental Theories

Developmental models authored by a number of theorists were examined. Isaac and O'Conner created experiments to study levels of abstraction. Piaget constructed a theory of perceptual and intellectual development of children. Gillian Stamp, using Jaques' definition of strata, investigated the expression of capability using card sorting as the mechanism for that expression. Rowbottom and Billis described the manifestation of work at various levels of a Research Unit based on Jaques' findings at Glacier Metal Co. and the Rowbottom and Billis action research program in the Social Services Organization Research Unit in England. Ian MacDonald identified a five-stage developmental model for the mentally retarded. Kohlberg described a five-stage progression of moral development. In the Literature Review, each of these theories was reviewed and compared with Jaques' Complexity of Mental Processing model.

Ways of Exploring Organization

Organizations were explored in a number of ways: Jaques' theory, definitions of organizational structure, and metaphors for organizations. Jaques' work focused on the underlying structures in a Managerial Accountability Hierarchy. The review of organizational structure explored how other theorists defined and used the term. The section on metaphor focused attention on different ways of classifying organizational theories and organizations.

Strata and Time-Span of Discretion

Strata and Time-Span of Discretion grew out of Jaques' work at Glacier Metal Co. Time-Span of Discretion is used to define, in measurable terms, the level of work delegated to subordinates. Strata are the managerial layers in a Managerial Accountability Hierarchy that are characterized by work that falls within a specified range of complexity. There is a one-to-one correspondence between strata and Complexity of Mental Processing level in a Managerial Hierarchy.

Methodology

Sample

Several United States presidential candidates who participated in public debates were selected for the purpose of this study. The sampling technique used for this study was convenience sampling. The sample was obtained by collecting transcripts of presidential debates posted on the Internet under the Commission on Presidential Debates and the New York Times, as well as in one book that included the debates between two presidential candidates. The total number of debates analyzed was 34. Of these, 29 were presidential debates and 5 were vice-presidential debates.

Conceptual Framework

Complexity of Mental Processing levels were used to analyze the data. Complexity of Mental Processing Level encompasses 2 components: Orders of Information Complexity and Mental Processes. Orders of Information Complexity is a taxonomy used to classify information according to its level of abstraction and its complexity. Mental Processing level indicates the way people group and compare information.

Data and Analysis

1. The transcripts of the presidential debates from the seven elections were examined. In five of these, the candidate who was a member of a major party and who demonstrated the highest Complexity of Mental Processing in the debates won the election.
2. In two of the presidential elections, the competing candidates demonstrated the same Complexity of Mental Processing level in the debates. In both cases the candidate who won was younger than his opponent. One candidate was 11 years younger and the other was 24 years younger.
3. In general, the vice-presidential candidates' Complexity of Mental Processing levels seem to be lower than their respective presidential candidates' Complexity of Mental Processing levels.

4. Results from a presidential primary election was inconclusive.

Conclusion

The study was designed to determine if Complexity of Mental Processing level is a factor in the election of Presidents of the United States. The question explored was:

Is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States citizens who participate in the presidential election process?

The data collected in this study supports an answer of yes. Five of the presidential candidates with the highest Complexity of Mental Processing level were elected President by the United States citizens who participated in the presidential election process.

Implications and Further Study

This study addressed the question of whether mental complexity is a factor in the election of Presidents of the United States. More specifically, is the presidential candidate with the highest Complexity of Mental Processing level elected President by United States citizens who participate in the general presidential election process? The findings indicate that Complexity of Mental Processing level is a factor in the selection of a President in a general election.

Given the data and analysis of this study, it seems reasonable to conjecture that Complexity of Mental Processing level may be a critical factor in the selection of a winning candidate in the general election.

These findings give rise to a number of possibilities to explore:

1) What affect is there on the voter who is concerned with the issues and whose candidate agrees with him/her on the issues? These findings suggest the candidate with the highest Complexity of Mental Processing level will win the general election. If that voter intuitively recognizes this, and does not feel the candidate of choice has a high enough Complexity of Mental Processing level to win the election, is it possible that this condition significantly contributes to voter apathy?
2) Are there certain political, social, or economic conditions in which Complexity of Mental Processing level would not be a factor in the selection of a presidential candidate in the general election? For example, would an incumbent candidate with the highest Complexity of Mental Processing level win a general election if the stock market crashed under his or her first term of presidency? If the United States were in the middle of a war in which voters perceived the country's very survival was at stake, would voters be willing to vote out an incumbent with lower Complexity of Mental Processing than his or her opponent?

3) The data collected from the set of debates examined at the primary level was inconclusive. Is Complexity of Mental Processing level a factor in selecting a candidate in the primary elections or are candidates in the primaries selected based on factors other than Complexity of Mental Processing level?
4) Is Complexity of Mental Processing level a factor in local elections?
5) Candidates participating in the presidential debates for the general election go through extensive preparation. It would seem likely that some answers are rehearsed in advance. If candidates were to rehearse answers that seemed to demonstrate a higher level of Complexity of Mental Processing than they were actually capable of performing, would the voters recognize the authenticity of the actual level with their voting behavior?
6) The findings in this study suggest that Complexity of Mental Processing level is a factor in the selection of a President in the general election. Jaques' findings suggest Complexity of Mental Processing is a significant factor in the ability of a manger to exercise managerial leadership. Is Complexity of Mental Processing a factor in other types of leadership roles? What roles are they (i.e. religious leadership, public education leadership, union leadership, etc.)? What are the common characteristics of roles where Complexity of Mental Processing level is

a factor in the exercise of leadership? What are the common characteristics in roles in which Complexity of Mental Processing level is not a factor in the exercise of leadership?

7) Because Complexity of Mental Processing analysis is dependent on language usage, fields of study that examine language would be useful to explore. (C.R. Kline, personal communication, June 26, 2000) For example:

   A. Rhetoric-

      1. referential and embedded discourse [Christensen, Francis, (1963) A Generative Rhetoric of the Sentence, College Composition and Communication 14(3), pp. 155-161]
      2. the beginning of sentences [Christensen, Francis, (1963) Notes Toward a New Rhetoric, College Composition and Communication, 15(1), pp. 7-11]
      3. message design [Zappen, James P. (1975) Francis Bacon and the Rhetoric of Science College Composition and Communication, 26(3) pp. 244-248.

   B. Composition and Communication

      1. meaning and context [Coe, Richard M., (1975) Eco-logic for the Composition Classroom, College Composition and Communication, 26(3), pp. 232-238.

2. aesthetic distance [Stuart, Donald, (1975) Aesthetic Distance and the Composition Teacher, College Composition and Communication, 26(3), pp. 238-244.
3. T-units [Nold, Ellen W. and Brent E. Davis, (1980) The Discourse Matrix, College Composition and Communication, 31(2), pp. 141-153.

C. Hermeneutics-text and context – [Kinneavy, James L., (1983). The Relation of the Whole to the Part in Interpretation Theory and in the Composing Process, Visible Language, 17 (2), pp. 120-145.]

8. The data collected on the election between Clinton and Bush suggests the possibility that Future Potential Capability may be an important factor in the election when the presidential candidates from the major political parties demonstrate the same Complexity of Mental Processing level in the presidential debates. What effect does Future Potential have on the selection of a President?
9. In the Clinton, Bush, Perot debates, Perot demonstrated the highest Complexity of Mental Processing level in the presidential debates. While a third party candidate has never won the presidential election, third party candidates have won congressional elections. What is the role Complexity of Mental Processing plays in congressional elections with third party candidates?

GLOSSARY

Classes (Level of Information Complexity) Classes are most often used by adults. Words are used as symbols to refer to tangible entities no longer present in the environment. Those operating at this level can not only use individual intangible entities, but they can use collections of tangibles. (E. Jaques, personal communication, September 26, 2000)

Complexity of Mental Processing Complexity of Mental Processing describes the complexity of the processes an individual has available to apply to his or her work. Mental Processes and Orders of Information Complexity are the 2 components that make up Complexity of Mental Processing. (Jaques, 1988)

Conceptual Abstract (Level of Information Complexity) Conceptual Abstract is being used when language is more than one step removed from an entity. Thus words and thoughts refer to other words and thoughts. This shift is reflected in the use of collections of intangibles. (E. Jaques, personal communication, September 26, 2000)

Cumulative Processing Cumulative processors puts forth a position by providing a number of ideas to support the position. However contrary to the Declarative Processor, each of the ideas cannot stand alone. Instead, the contribution of all the ideas together are used to support the position. (Jaques and Cason, 1994; G. Mehltretter, personal communication, February 1999)

Example

Idea A + Idea B + Idea C = Position

Logic:

A + B + C

Current Potential Capability Current Potential Capability is the highest complexity level of work that an individual can assume responsibility for, given that he/she values the work and had the necessary experience and skilled knowledge required to successfully perform the work. (Jaques, 1988)

Declarative Processing A Declarative processor puts forth a position by providing a number of unrelated ideas to support his or her position. Each idea stands alone. There is no explicit connection between the ideas. It can be recognized by its staccato-like quality produced by the speaker's presentation of disconnected statements. (Jaques and Cason, 1994; G. Mehltretter, personal communication, February 1999)

Example:

Idea A = Position

Idea B = Position

Idea C = Position

Logic:

A or B or C

Depth Structure Depth structure is the underlay that drives the social structure. This implies that "there exist underlying systems or wholes which can be discovered and which can give explanatory meaning to the world of observation." (Jaques, 1976, p. 42)

Future Potential Capability Future Potential Capability is the level of potential capability a person will be able to exercise at a designated time in the future. (Jaques, 1988)

Level of Work Level of work refers to "the weight of responsibility felt in roles as a result of the complexity of the work in the role." (Jaques, 1996)

Managerial Accountability Hierarchy "A system of roles in which an individual in a higher role (manager) is held accountable for the outputs of persons in immediately lower roles (subordinates) and can be called to account for their actions." (Jaques, 1988)

Mental Processes Mental Processes are processes that determine how information gets organized. Jaques postulates that these processes progressively increase in complexity. There are four mental processes: (1) Declarative Processing, (2) Cumulative Processing, (3) Serial Processing, and (4) Parallel Processing. (Jaques and Cason, 1994)

Orders of Information Complexity If the mental processes are the "how" people think, Orders of Information Complexity are the "what" people think about. Orders of information complexity are the increasingly complex chunks of data in the external world which we must take in and give name to and use to inform our cognitive processing to solve problems." (Jaques, 1991b, p.57) There are five Orders of Information Complexity (1) Self Explanatory Gesture, (2) Specifics, (3) Classes, (4) Conceptual Abstract and (5) Universal.

Parallel Processing Parallel Processors put forth a position by providing a number of series (see above) which are interlinked. Thus two or more ideas are held in parallel. This argument is built on interrelationships among a number of series. (Jaques and Cason, 1994; G. Mehltretter, personal communication, February 1999)

Example

Series 1	Idea A ->Idea B-.>Idea C
Series 2	Idea E->Idea B -> Idea D
Series 3	Idea F ->Idea B -> Idea D -> Idea G -> **Position**

Self Explanatory Gesture (Level of Information Complexity) Self Explanatory Gesture is more concrete than the other Orders of Information Complexity. Expression takes the form of gestures and physical touch with objects. Infants function at this level.

Serial Processing Serial Processing puts forth a position by showing how one idea leads to another idea, which leads to another idea. This linking of three or more ideas is called a series.

Example

Idea A -> Idea B -> Idea C = Position

Logic:

If A then B, If B then C

Specifics (Level of Information Complexity) Specifics is most often used by children. Those who operate at this Order of Information Complexity limit their use of language to tangible objects either existing in the environment or presumed to be present in the environment because of the recency of their presence. Their language is often paired with the object by pointing to the location the object resides or is thought to reside. (E. Jaques, personal communication, September 26, 2000)

Surface Structure Surface structure arises from defining a concept in terms of its properties. Applying this definition to the concept of social structure, the surface structure would be "the system or network of connected roles which can be deduced or abstracted by direct observation." (Jaques, 1976)

Time Horizon "Time Horizon is the longest time-span that person can handle in any kind of work." It is a method for measuring an individual's potential capability. (Jaques, 2000)

Time-Span of Discretion Time-Span of Discretion is "the longest period which can elapse in a role before the manager can be sure that his subordinate has not been exercising marginally sub-standard discretion continuously in balancing the pace and the quality of his work." (Jaques, 1971p. 17)

Universals (Level of Information Complexity) Universals are used to solve problems which concern entire societies, moral systems, artistic masterpieces, and significant reforms in scientific theory. (Jaques, 1988)

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