THEORY OF MANAGERIAL ORGANIZATIONS

INVESTIGATING THE OPTIMUM MANAGER-SUBORDINATE RELATIONSHIP OF A DISCONTINUITY THEORY OF MANAGERIAL ORGANIZATIONS: AN EXPLORATORY STUDY OF A GENERAL THEORY OF MANAGERIAL HIERARCHY

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Preface

This research explores the requisite relationship between managers and their subordinates in managerial hierarchies as stipulated by a general theory of managerial hierarchy (GTMH) developed by Dr. Elliott Jaques. Dr. Jaques writes, "When managers and immediate subordinates are in roles in adjacent layers, things can work well; if within same layer, the manager is "breathing down the necks" of the subordinates; if more than one layer apart, the manager is "pulled down in the weeds".

Jaques' empirical finding of the Manager-Subordinate Relationship (MSR) describes how a subordinate, in a managerial hierarchy, feels towards the manager, and how the manager feels towards the subordinate. Optimum MSR is achieved when the subordinate feels *just right* towards the manager. In Optimum MSR, the manager also feels just right towards the subordinate and that the subordinate does not "pull the manager into the weeds."

In the non-Optimal Manager-Subordinate Relationship (non-effective management according to Dr. Jaques' theory), the subordinate reports either that the manager is *too close* (breathing down the necks), or *too far* (pulled down into the weeds). The manager in non-Optimum MSR also reports either of the two conditions: that the subordinate is either too close or too far.

The relationship between the working stratum of managers and subordinates and Jaques' manager-subordinate relationship-types has not been tested. This study is the first attempt to test these specific theoretical propositions developed by Jaques, and possibly advance general theory of managerial hierarchy.

The study's primary research question is whether there is a relationship between the working roles of the managers and subordinates, and Jaques' MSR.

The study's exploratory secondary research question attempts to discover the effects of the current potential capability of manager and subordinate on the MSR as defined by Jaques and Cason. The effects of current potential capability on the MSR are not described by general theory of managerial hierarchy, though Dr. Jaques discussed privately with the author the possibility that capabilities may play a significant part (in addition to the working stratum), impacting the manager-subordinate relationship.

The exploratory proposition of the secondary question is whether MSR correlates strongly when the manager's role is one stratum higher than the subordinate's role and the manager's current potential capability (CPC) corresponds with the manager's role stratum, and the subordinate's current potential capability corresponds with the subordinate's role stratum.

The author believes it is possible to test the primary research question, and thus, test this aspect of the theory (this proposition has not been tested). Furthermore, the secondary question could potentially advance the theory relating capabilities of managers and subordinates to their working strata.

Contents

Chapter 1.
Introduction

In his paper, "A Dynamic Theory of Personality"[1] (1935), Kurt Lewin described his longing for a dynamic theory of the social sciences and of psychology, in particular. He compared the state of psychology to the Aristotelian theory of natural sciences, which was static and incapable of dealing with the dynamics of moving bodies. Lewin wrote that contemporary psychology was too static to deal with the dynamics of living humans and incapable of predicting or explaining the dynamics of specific behavior of actual living people.

Dr. Elliott Jaques developed his theories over 55 years, spanning the latter half of the twentieth century into the early twenty-first century. He contends that his theories are dynamic, are based on science, and address the phenomena of organizations, thereby responding to Kurt Lewin's quest for a Galilean mode of thought in the social science field. Dr. Jaques considers the Galilean mode of thought dynamic – he writes about Galileo and dynamics in physics:

> Galileo's stroke of pure genius was to recognize that it was possible to measure velocity by measuring the same two points—a lead ball and the starting end of an undefined plan—and then measuring the time it took the lead ball to reach equal distances down the ramp. He thus got change in distance between the two

[1] Lewin, Kurt (1935). A dynamic theory of personality. New York, NY: McGraw-Hill.

points in given times—and measured an acceleration! Modern physics (dynamics) was born.[2]

This research tests a general theory of managerial hierarchy developed by Dr. Elliott Jaques, and investigates and attempts to discover the relationship between managers and subordinates in managerial-type organizations.[3] Dr. Jaques believed his theory was the first theory capable of understanding, explaining, and predicting, the dynamics of behavior in managerial organizations, thus, becoming a foundation for the author's research.

Theoretical Background

A theory is good theory if it satisfies two requirements: It must accurately describe a large class of observations on the basis of a model that contains only a few arbitrary elements, and it must make definitive predictions about the results of future observations.[4]
Stephen W. Hawking

Jaques' Stratified Systems Theory evolved from and is based upon the General Theory of Bureaucracy,[5] introduced by Dr. Elliott Jaques in the late 1970s. The General Theory of Bureaucracy and the Stratified Systems Theory (also known as the Requisite Organization theory)[6] developed into the new theory[7] addressing the phenomenon of the managerial type of organizations, hereinafter referred to as a general theory of managerial hierarchy (GTMH).[8] The figure on the following page depicts the general progression of Dr. Jaques' and his colleagues' thought and theory development since the 1950s.

This research concentrates on the concepts of a general theory of managerial hierarchy as they relate to the research questions. The paper includes the foundations for the Theories of Life,

[2] Jaques, Elliott (2002). Suggested concepts for "Space" and "Time". Gloucester, MA: Unpublished Paper.

[3] Managerial organizations, also called managerial systems, employment hierarchies, accountability hierarchies and bureaucracies are the type of organizations that consists of managers and subordinates individually hired for a wage or salary with an employment contract. Managerial systems are generally organized by associations, such as shareholders, partnerships, states, individuals and other non-managerial entities.

[4] Hawking, Stephen W. (1988). A brief history of time: from the big bang to black holes. New York, NY: Bantam Books.

[5] Jaques, Elliott (1976). A general theory of bureaucracy. London, UK: Heinemann Educational Books.

[6] Jaques, Elliott (1996). Requisite organization: a total system for effective managerial organization and managerial leadership for the 21st Century. Arlington, Virginia: Cason Hall & Co.

[7] There appears to be widespread confusion about which theory is current and whether the three theories are different or the same.

[8] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

Information Complexity, and Time and Space only as they relate to a general theory of managerial hierarchy and this study.

Throughout his lifetime, Dr. Elliott Jaques developed many theories dealing and addressing different phenomena, and so, it is necessary to depict how all Jaques' theories fit together, and from where general theory of managerial hierarchy is derived. Historically, this theory was also known under different names, such as Stratified Systems Theory and Requisite Organization Theory, and the following figure depicts how the theories have been developed and related to each other:

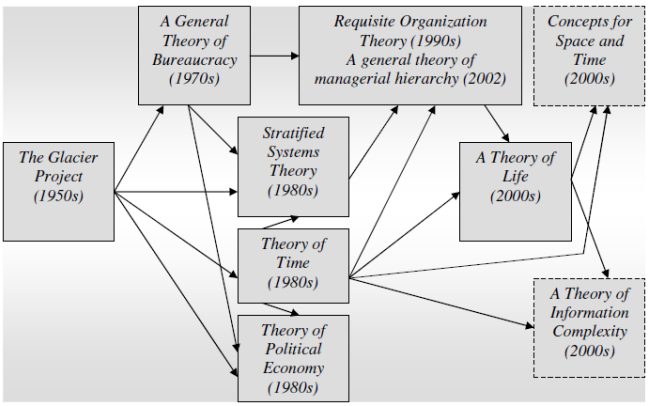


Figure 1. *Historical Development of the Theories*[9]

Jaques' known work started with the Glacier Project in the 1950s. Then Jaques discovered a time-span measurement instrument to measure[10] the level of work in a managerial hierarchy – appendix 2 (page A-4) provides a description of this instrument – which culminated in his publication of the Time-Span Measurement Handbook in 1964.[11]

The discovery of this instrument helped Jaques analyze other types of organizations, and he developed a "general theory of bureaucracy"[12] in the 1970s, which was a starting point a general theory of managerial hierarchy (2002).[13] In the 1980s Jaques

[9] The boxes with uninterrupted lines denote a completed theory, and the boxes with interrupted lines denote unfinished theories.

[10] Appendix 1 explains how and why Jaques uses the word measure in his publications; the word measure has a precise and special meaning within all of Jaques' theories.

[11] Jaques, Elliott (1964). Time-Span Measurement Handbook.: Cason Hall.

[12] Jaques, Elliott (1976). A General Theory of Bureaucracy. London, UK: Heinemann Educational Books.

[13] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

renamed and modified the theory to "Stratified Systems Theory," and in the 1990s, he further re-worked and renamed it Requisite Organization Theory,[14] and later in 2002, he renamed it again to "general theory of managerial hierarchy," which is what the theory is called nowadays. Jaques' other work includes a theories of time (1980s),[15] political economy (1980s),[16] Theory of Life (2000s),[17] and the beginning of Concepts for Space and Time [18] and Information Complexity (2000s).[19] The latter works, unfortunately, have not been completed.

A general theory of managerial hierarchy complies with Stephen Hawking's definition of a good theory, as quoted previously, because it precisely describes the managerial organizations worldwide and makes definitive predictions about the future developments of these organizations and their behavior. Thus, the theory is testable and refutable because a comparison can be made between predictions and future observations.

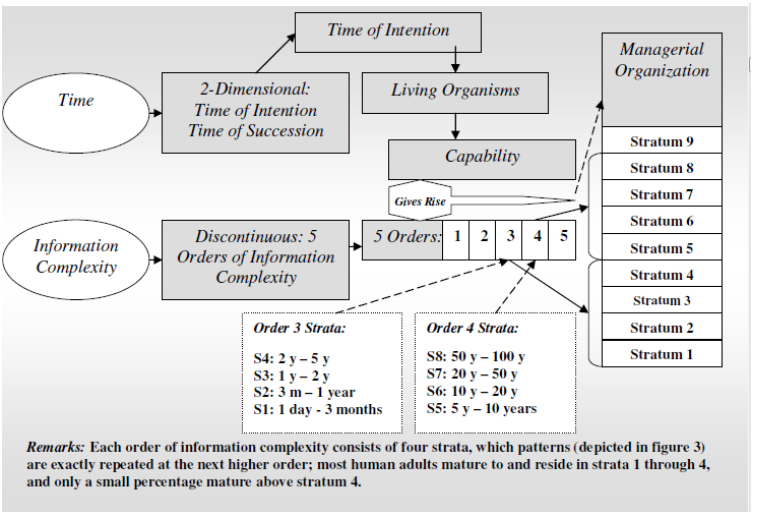


Figure 2. *Foundations of a general theory of managerial hierarchy*

[14] Jaques, Elliott (1996). Requisite Organization: A Total System for Effective Managerial Organization and Managerial Leadership for the 21st Century. Arlington, Virginia: Cason Hall & Co.
[15] Jaques, Elliott (1982). The Form of Time. New York, New York: Crane, Russak & Company.
[16] Jaques, Elliott (1982). Free Enterprise, Fair Employment. New York, NY: Crane, Russak & Company.
[17] Jaques, Elliott (2002). The Life and Behavior of Living Organisms: a General Theory. Westport, CT: Praeger Publishers.
[18] Jaques, Elliott (2002). Suggested concepts for "Space" and "Time".: Unpublished Paper.
[19] Jaques, Elliott (2002). Orders of Complexity of Information and of the Worlds We Construct.: Unpublished Paper.

Hawking, one of the world's leading theoretical physicists, asserts that a good theory should contain only a few arbitrary elements. A general theory of managerial hierarchy is founded on only two fundamental concepts: (1) time and (2) information complexity. The following figure depicts how these two concepts establish a general theory of managerial hierarchy.[20]

The first fundamental proposition and assumption is that time is two dimensional, consisting of (1) succession (the normal passing clock time) and (2) intention (plans to achieve certain desired results by a certain deadline or, as Dr. Jaques maintains, to achieve "what by when"). Intentionality is the main characteristic that defines living organisms and distinguishes them from physical objects. For example, physical objects do not try to achieve goals within a certain timeframe—or, in Dr. Jaques' words, "they are not going anywhere." Living organisms,[21] on the other hand, are trying to achieve their goals, such as satisfy hunger, write a paper, read a book, and so on, by a specific deadline. All living organisms, thus, reside in a five-dimensional world—the three space coordinates and the two time dimensions, i.e., succession and intention.

The clock time, the one that is most understood by the researchers and the society in general, measures how long it took for the events to occur – Elliott Jaques calls it time of succession[22]. Dr. Jaques writes[23] that ancient Greeks called this aspect of the time phenomenon *Chronos*, and he proposes to think of it as a dimension of time. The other is the time of intention, or as Dr. Jaques writes ancient Greeks called it *Kairos*, the time of opportunity. Time is two-dimensional consisting of the dimensions of succession and intention, or how long it took for the event to occur (natural sciences event), and *by when* someone intends to achieve certain results (social sciences event).

Humans are the only known species to have the capability to plan events into the longest possible future to deal with the changing worldly events. They span across the five orders of information complexity,[24] while other known species mature only

[20] The development of the theories of information complexity and time and space has unfortunately been interrupted by the sudden death of Dr. Elliott Jaques on March 8, 2003 (at age 86).

[21] Within the scope of this analysis, the discussion is strictly limited to the single- and multi-cellular organisms, and excludes trees and plants from the paper's scope.

[22] Jaques, Elliott (1982). The Form of Time. New York, New York: Crane, Russak & Company.

[23] Ibid.

[24] Jaques, Elliott (2002). Orders of complexity of information and the worlds we construct. Gloucester, MA: Unpublished Manuscript.

within the first order. Most human adults operate in Order 3, which means that they are capable of planning events between one day and five years into the future. Extraordinary humans reside in the next order of capability, Order 4, and are capable of executing goals lasting between 5 to 100 years into the future (depending on to which stratum[25] the individual has matured). Still fewer people, those who are considered to be geniuses, reside in Order 5, and have the capability to foresee, plan and work on events beyond 100 years time-span.

The evidence (data) has shown that all living organisms, regardless of the species, deal with the rising complexity of information in four distinct ways: in declarative, cumulative, serial, and parallel modes. These four modes are repeated exactly in the next higher order, as shown in the following two figures:

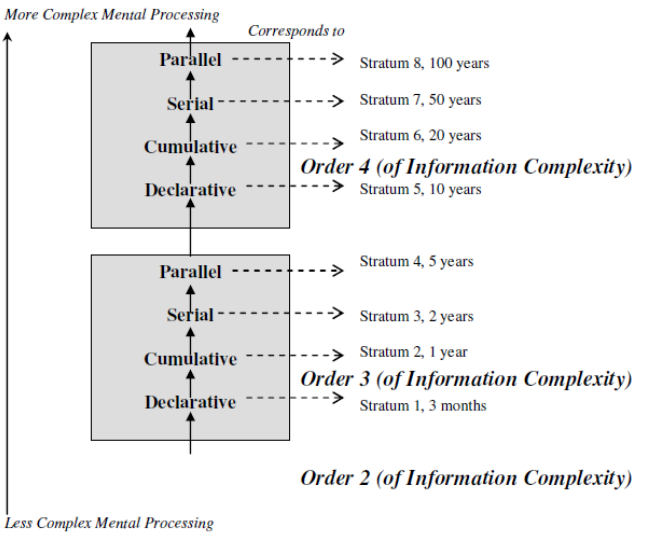


Figure 3. *Repeating Modes*

Four discontinuous[26] and objectively noticeable strata lie within each order of information complexity. The species mature from the lowest stratum to the highest possible depending on the internal growth capability of the organism, which has not been found to be

[25] Refer to figure 2 above.

[26] The strata are discontinuous because there is no intermediary state to which the organism matures when growing in capability from stratum n to stratum n+1, and there is a clear and observable boundary between each stratum.

dependent on any social factor, such as education, status in society, and so on.

GTMH main proposition is that the discontinuous capability of humans has created the discontinuous levels of managerial organizations. Because humans' capability spans several orders of information complexity,[27] they naturally develop a managerial organization where roles are formed at different strata. The managerial organization consists of roles, and, according to GTMH, each manager-subordinate role should be a stratum apart, where the manager's role is exactly one stratum higher than the subordinates' roles and where each person's capability matches the role's stratum.

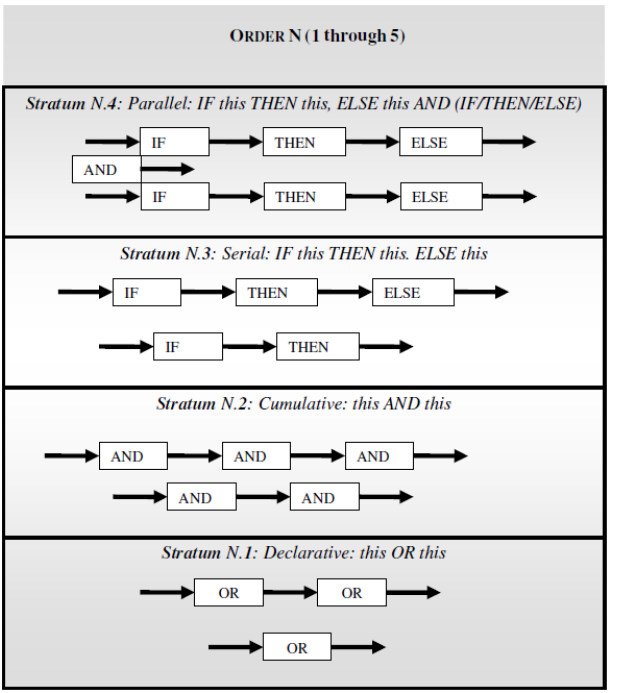


Figure 4. *Information Processing Modes*

Dr. Jaques' role-measuring instrument, also known as the time-span of discretion (TSD), measures the size of discretion the employee has to make his or her decisions as authorized by the manager. Dr. Jaques has found that only two different types of roles exist in managerial hierarchies—single-task and multi-task—

and each role is measured in different ways. In both cases, the manager determines the size of the subordinate's role by setting a limit on how much time the subordinate is allowed to make his or her own decisions before reporting back to the manager for another project or authorization (multi-tasking role) or how long it would take a manager to find out if the subordinate's work is substandard (single-tasking role).

Each role can be measured precisely, and the ratio-scale data for the size (level) of the role can be obtained using what is known as "the role-measuring instrument."[28] The following eight strata are identified by Jaques' general theory of managerial hierarchy:

Table 1.1. *Time-Span of Discretion Period*

Time-Span of Discretion Period		Stratum of the Role
1 day	– 3 months	Stratum 1
3 months	– 1 year	Stratum 2
1 year	– 2 years	Stratum 3
2 years	– 5 years	Stratum 4
5 years	– 10 years	Stratum 5
10 years	– 20 years	Stratum 6
20 years	– 50 years	Stratum 7
50 years	– 100 years	Stratum 8

Dr. Jaques devoted three years to developing the role-measuring instrument in the 1960s[29] in order to measure the size of the role in any managerial hierarchy not depending on the occupation type. For example, the role of an accountant in stratum 3 would be equivalent to the role of a software engineer working in the same stratum.

No instrument precisely measures each person's capability, although Jaques and Kathryn Cason have developed several evaluative methods[30] that can evaluate the capability of a human to determine to which stratum and to which level—high, middle, or low—within that stratum the member has matured.[31] Furthermore, the data collected by Jaques show that capability matures in stable and predictable patterns based on the in-born trajectory rate and the time of succession (clock-time). For example, the data show that a person whose capability is determined at a certain age will grow

[28] The time-span of discretion measuring instrument is described in Chapter 1 Appendix 2.
[29] Jaques, Elliott (1964). Time-span measurement handbook. Cason Hall.
[30] Jaques, Elliott & Cason, Kathryn (1994). Human capability. Rockville, MD: Cason Hall.
[31] The methods used to evaluate the capability of the person are described in Chapter 1 Appendix 3.

(or decline)[32] to predictable levels of capability at various ages, as defined by the "potential progression chart"[33] developed by Jaques. The person whose capability is high stratum 2 at age 20 will mature to high stratum 5 by age 70, and the person whose capability is low stratum 4 at age 20 will mature to low stratum 8 by age 60. Thus, capability is predictable at any time of succession into the future when the person would mature from one stratum to the next. If the trajectory rate is high enough, the evaluative methods help identify the highest order and the highest stratum within this order to which the person can mature.[34]

Having recognized the main cause for the rise of the managerial organization,

Dr. Jaques identified major components of an organization and their relationships to one another, such as manager, subordinate, roles, authorities, accountabilities, and others,[35] in accordance with the General System Theory, originally developed by Ludwig von Bertalanffy.[36] The main proposition of the General System Theory is that systems are "sets of elements standing in interrelation." Dr. Jaques thinks of the managerial organizations as a "complex of interacting components"[37] (pp. 38, 91).

Following Stephen Hawking's requirements of a good theory, a general theory of managerial hierarchy makes definitive predictions for all managerial organizations that could be tested objectively and scientifically. Some general predictions are:

If the CEO's role is stratum *n*, but the incoming CEO's capability is less than *n* (one or more strata below *n*), the company will suffer—there will be an outflow of people, the new CEO will be fired, or the company will be reduced in size to match the capability of the CEO. Instead of being the stratum *n* company, it will become an *n-m* company. Furthermore, a market test could be constructed. If the new CEO's capability is a stratum or more higher than the previous, the market value of the company will

[32] Depending on the trajectory rate, each member either always increases in capability with age, or the capability diminishes in old age because of the low initial trajectory.

[33] Jaques, Elliott (1996). Requisite organization: a total system for effective managerial organization and managerial leadership for the 21st century. Arlington, Virginia: Cason Hall & Co.

[34] The current predictability rates do not account for high-velocity/gravitational variables because they play an unnoticeable role as evidenced by data collected by Jaques. These effects, however, should be considered in further development of a general theory of managerial hierarchy.

[35] Jaques, Elliott (2002). "The psychological foundations of managerial systems: a general systems approach to consulting psychology." San Antonio, TX: Midwinter Conference of the Society of Consulting Psychology.

[36] Bertalanffy, Ludwig von (1968). General system theory: foundations, development, applications. New York, NY: George Braziller.

[37] Ibid.

rise, and the shares of stock will rise in value and price—the opposite of what would happen if the new CEO's capability were below the requirements of the role.

If the manager's role is one stratum higher than the subordinate's, and the capabilities of the manager and the subordinate match the complexity of the role, this would constitute an effective manager-subordinate relationship, with both the manager and subordinate reporting feeling comfortable in their working relationship.[38]

Users of a general theory of managerial hierarchy could create other tests, such as role-based pay, to evaluate logical corollaries.

In summary, a general theory of managerial hierarchy is scientific and based on few arbitrary elements with definitive boundaries and predictions that are objectively testable. Furthermore, GTMH[39] allows ratio-scale measurements of the size of the role (level of work) via a time-span measurement instrument[40] and an accurate objective evaluation of the capability of the member of the human species.[41] The time-span measuring instrument, developed by Dr. Jaques, measures the level of work with ratio scale values to compare the working roles in managerial organizations across different occupations, industries, and nations. The time-span measuring instrument allows the size of the role to be identified, thus, making a scientific analysis of a managerial organization possible. Furthermore, Dr. Jaques believed that this measuring technique could possibly change the field of psychology because it allowed precise measuring of people's intentions. This latter point, however, is beyond the scope of this research.

Delimitation of the Study

This study is limited to managerial organizations only – organizations of other kinds, such as societies, associations, tribes, and others that are not managerial corporate bureaucracies are outside the scope of this study.

The major reason that all non-managerial organizations are outside of the project's scope is that at the present development of a general theory of managerial hierarchy, it is possible to measure the level of work using the time-span of discretion instrument only in managerial-type organizations. At the present time, there is no

[38] The author is testing the manager-subordinate relationship in an attempt to validate and possibly advance a general theory of managerial hierarchy in this research.
[39] GTMH stands for Jaques' general theory of managerial hierarchy; this and other Jaques' terms are defined in Appendix 5.
[40] Jaques, Elliott (1964). Time-span measurement handbook. Cason Hall.
[41] Jaques, Elliott & Cason, Kathryn (1994). Human capability. Rockville, MD: Cason Hall.

precise ratio-scale instrument to measure the level of work within organizations which are not managerial bureaucracies, and thus, the study is limited only to managerial hierarchies due to lack of the measuring instruments to measure the level of work in other types of organizations.

Research Questions

My theoretical proposition stems from two key discoveries that were made through the use of the two measures. The first was that there is one, and only one system of requisite layers for all managerial hierarchies, with boundaries between layers identifiable by time-span measurement… When managers and immediate subordinates are in roles in adjacent layers, things can work well; if within same layer, the manager is "breathing down the necks" of the subordinates; if more than one layer apart, the manager is "pulled down in the weeds."[42]

Dr. Elliott Jaques

Research Question 1

The study's primary research question is whether there is a relationship between the working roles of the manager and subordinate, and the MSR.[43] In other words, this question could be described as follows:

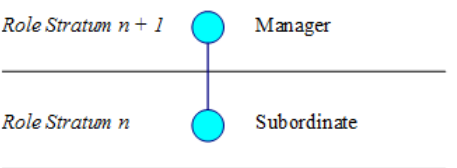


Figure 5. *Optimum Manager-Subordinate Relationship (just right)*

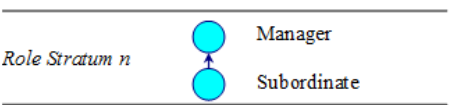


Figure 6. *Non-optimum Manager-Subordinate Relationship (too close)*

[42] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

[43] MSR stands for Jaques' Manager-Subordinate Relationship; this term is explained on the next page, and in Appendix 5.

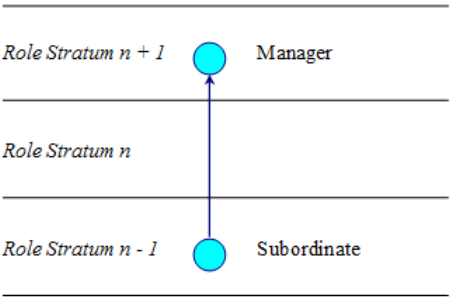


Figure 7. *Non-optimum Manager-Subordinate Relationship (too far)*

This empirical finding of the Manager-Subordinate Relationship (MSR) by Dr. Elliott Jaques describes how a subordinate, in a managerial hierarchy, feels [44] towards the manager, and how the manager feels towards the subordinate. Optimum MSR (OMSR) is achieved when the subordinate feels just right towards the manager. In OMSR, the manager also feels just right towards the subordinate and that the subordinate does not "pull the manager into the weeds."

In the non-Optimal Manager-Subordinate Relationship (non-OMSR) (non-effective management according to Dr. Jaques' theory), the subordinate reports either that the manager is too close (breathing down the necks), or too far (pulled down into the weeds). The manager in non-OMSR also reports either of the two conditions: that the subordinate is either too close or too far.

Research Question 2

The study's secondary (exploratory) research question attempts to discover the effects of the current potential capability of manager and subordinate on the MSR as defined by Jaques and Cason.[45] The effects of current potential capability on the MSR are not described by general theory of managerial hierarchy, though Dr. Jaques discussed privately with the author the possibility that capabilities may play a significant part (in addition to the working stratum) impacting the manager-subordinate relationship[46], and thus this proposition is exploratory in nature.

The exploratory proposition of the secondary question is whether MSR correlates strongly when the manager's role is one stratum higher than the subordinate's role and the manager's

[44] Jaques believes that the subordinate (and the manager) intuitively knows whether the manager is breathing down the subordinate's neck, is too distant, or manages just right.
[45] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.
[46] Jaques, Elliott (2001-2003). Personal Communication.

current potential capability (CPC) corresponds with the manager's role stratum, and the subordinate's current potential capability corresponds with the subordinate's role stratum.

Importance of the Study

Most work in modern democratic societies is conducted in special types of organizations – managerial hierarchies. Managerial hierarchy is the most common worldwide organization of citizens of a country to earn a living in the modern civilization, which consists of manager and subordinate roles occupied by people contractually hired to perform in that specific role. Thus, because the managerial organization is one of the most fundamental work institutions in the modern civilization, any study conducted to investigate, explain, test, or better this form of organizing people has a potential of improving and impacting the society in a positive way, and thus, is necessary to do.

This research investigated the relationship between managers and subordinates – which are the two fundamental parts of the managerial organization. Dr. Jaques (1976, 1989, 1996, 2002) offers a theoretical way proposing the solution to the problem of ineffective structuring managers to subordinates, but his solution has not been fully tested.

As mentioned earlier, this research is the first study to test Dr. Jaques' theoretical propositions regarding managers and subordinates. Furthermore, this research attempts to discover the effects of human capability on the relationship between managers and subordinates.

Having conducted the study, in addition to testing Dr. Jaques' theoretical findings, and possibly discovering new principles and amending the theory, the investigation will have practical implications to structuring and designing the roles and relationships between managers and subordinates in managerial-type organizations.

Chapter 2.
Literature Review

Definition of a Scientific Critique

After reading through an exhaustive collection of references purportedly related to Jaques' theories, the majority of which were collected by Kenneth Craddock,[47] the author concluded that most of the literature, in fact, is not closely related. The few scientific critiques that have been undertaken of Jaques' work are discussed and examined in this chapter.[48]

In order to separate scientific critiques from speculative opinions, one must define exactly what constitutes a scientific critique. In this paper, a scientific critique is considered an argument based upon logical or theoretical foundations that are testable with data, or could potentially be tested with data,[49] or the actual empirical tests. An unscientific critique, then, is an argument not possible to test with data, thus, non-testable.[50] An

[47] Craddock, Kenneth (2002). Requisite leadership theory: an annotated research bibliography on Elliott Jaques. New York, NY: Columbia University.

[48] Having reviewed Kenneth Craddock's work, the author believes that most of the references that Craddock has collected as "corresponding to the works of Dr. Elliott Jaques," in fact, are loosely related to Jaques' theories.

[49] The author considers a proposition to be scientific even if an empirical test (or series of tests) is impossible to implement at the present time due to a variety of reasons, such as technological limitations and others; nonetheless, theoretically, a test(s) must be constructed that when, in the future, it becomes possible to test the proposition(s), it could be done.

[50] The word non-testable in this sentence has its absolute meaning that to test the propositions of the argument is impossible at any present time or future – the test cannot possibly be constructed.

argument that cannot be tested with data is considered unacceptable in this paper because its propositions are speculative. Some of the more interesting unscientific critiques, however, will be discussed later in section 2.3.

Stephen Hawking demonstrates the constitution of a scientific critique on the change of thought from the Aristotelian theory to the atomists in the early 1900s. He writes that Einstein's paper (1905) "pointed out what was called Brownian motion–the irregular, random motion of small particles of dust suspended in a liquid–could be explained as the effects of atoms of the liquid colliding with the dust particles"[51] (p. 64). Einstein's critique of the Aristotelian theory, which claimed that the universe was made up of four basic elements—earth, air, fire, and water—and that the matter was continuous, was scientific, based upon theoretical propositions found in the atomic theory, and could be tested with data. Indeed, unscientific critiques of the Aristotelian theory, Hawking writes, have not settled the differences between the two schools of thought. He pointed out that the matter was settled in the early 1900s only when Einstein provided a scientific critique supported with data, which could be tested independently and objectively. Similarly, this paper attempts to differentiate between scientific and unscientific critiques in order to move the theory along rather than perpetuate a speculative proposition.

Hawking provides another example that demonstrates the difference between a scientific and unscientific critique. In A Brief History of Time, Hawking writes that when Einstein became unpopular, a book called 100 Authors Against Einstein was published, to which Einstein responded: "If I were wrong, then one would have been enough"[52] (p. 178). A similar premise stands for critics of Jaques' theories—there may be a number of critics, but few researches actually tested the premises, conclusions, and stipulations on which the theory is founded. Furthermore, historical developments of theories in other fields, such as physics, show that only testable scientific critiques make a difference in the development of thought and only testable scientific critiques gain acceptance. Only scientific critiques are considered fundamental contributions, while speculative opinions, even though interesting, do not reach the level of a serious debate, either to refute or accept the propositions of theories, including a general theory of managerial hierarchy.

[51] Hawking, Stephen W. (1988). A brief history of time: from the big bang to black holes. New York, NY: Bantam Books.
[52] Ibid.

Scientific Critique

The author conducted an extensive search, identified and reviewed all discovered during the investigation scientific critiques and studies of Dr. Jaques' theories and found none that disagreed with his findings. All, in fact, have been confirmatory. Although the number of studies and tests of the theories are limited, some important and credible work has been done. Most notable are the studies completed over a period of 25 years by John Isaac and those undertaken by several doctoral fellows, who tested portions of the theories as their doctoral theses.

Isaac's work has confirmed Jaques' discontinuity of human development and his hierarchal strata proposition. In his studies, Isaac created and advanced the scientific methods to evaluate the capability of a human. His methodology tested the person's capability to solve a problem under increasing duress, observing the point at which time the person becomes incapable of solving the problem. This method, then, tested the maximum capability of the person at that specific moment.

Considerable work [53] has also been done on fair pay in managerial organizations, all of which have confirmed Jaques' theoretical proposition that people in the same role feel the same fair compensation (in the same geographical area), not depending on the profession, specialty, or other factors. Another study investigated a change in small business when a reasonably capable (according to Jaques' theory) individual took charge of a business transition. Finally, another study confirmed Jaques' proposition that the more capable candidate has always won the presidential election in the United States. All these studies are described in the sections following.

John Isaac

John Isaac, a researcher in the United Kingdom, worked independently of Jaques on investigating the nature of human capability and ways to measure this capability. He collected data, analyzed them, and devised numerous tests to evaluate the person's capability. Nonetheless, his studies largely confirm Dr. Jaques' fundamental premise of the discontinuity in the capability of human beings.

Levels of Abstraction in Logic and Human Action book, compiled and edited by Dr. Jaques and published in 1978, includes re-publication of four of Isaac's essays. Isaac had published these

[53] All works mentioned in this paragraph are described in detail in the next sub-chapters, each of which summarizes and discusses each study in detail.

articles in the Journal Human Relations[54] years before allowing them to be reprinted in this book. His essays are the most substantial scientific critiques of Dr. Elliott Jaques' theories regarding the stratification of bureaucracies[55] based on the discontinuous psychological development of the human species.

Isaac's article, "Experimental Treatment of Discontinuity Theory of Psychological Development,"[56] describes a test of Jaques' fundamental assumptions (axioms) forming the basis of a general theory of managerial hierarchy. Isaac tests this assumption—that the managerial levels are based upon the discontinuous capacity[57] of humans or upon their diverse psychological development—by assigning the same task to a sample population. He examines the different ways each type of the capacity population will solve the same-complexity problem, hoping to find objective and distinguishing characteristics between different emerged behaviors. Isaac's assumption is that an individual would behave in six qualitatively different patterns. Thus, the result of the experiment must be a multi-modal distribution as supporting evidence of the discontinuous capacity of humans. Isaac writes:

> The experimental work is directed to testing the proposition that with a large number of persons involved in some problem situation, measurements made of each individual's performance in terms of a parameter or combination of parameters are distributed multi-modally. (p. 42)

Isaac designed several problems as an experiment to use on more than 500 subjects. Analyzing the results, he came to a conclusion that supports multi-modality,[58] confirming the hypothesis of the discontinuous psychological development of humans. Isaac (1978)[59] reports: "It may be concluded that the form of these distributions is dependent, not on the forms of the particular problems from which they arose, but on the psychological structures of the subjects who solve the problems" (p. 58).

[54] More information about the journal Human Relations is available on the web site, www.sagepub.com/journal.aspx?pid=123.
[55] The terms "bureaucracy" and "managerial hierarchy," in this paper and in Jaques' works are synonyms.
[56] Isaac, D. J. & O'Connor, B. M. (1978). Experimental treatment of discontinuity theory of psychological development. London, U. K.: Heinemann Educational Books.
[57] Isaac uses the term capacity in his writings, which Dr. Jaques calls capability – both words are the exact synonyms of the term describing the human capability.
[58] Multi-modality is Issac's mathematical term for describing discontinuous capabilities of people in his studies.
[59] Ibid.

He conducted the same experiments with a younger population of 12- to 17-year olds only to abandon them because too many could not resolve the problems. Instead, he opted for a less abstract problem from a Multiple Choice Apparatus, credited to R. M. Yerkes (1924). The results were consistent with the Isaac's hypothesis of multi-modality.

Isaac's overall conclusion and analysis of data confirm the discontinuity of human capacity, and he concluded that the tests confirm his discontinuity theory.

Isaac's "Use of Loss of Skill under Stress to Test a Theory of Psychological Development"[60] describes another test of the theory of discontinuity of psychological development of humans. It adds more support to the basic foundation of a general theory of managerial hierarchy.

The premise that John Isaac used is the loss of skill under stress or "collapse of organized behaviour through the imposition of excessive levels of information input" (p. 71). Isaac's proposition is that giving the subjects a problem of the same complexity, then training them to resolve it under no duress, and increasing the rate of incoming information at fixed times should produce a multi-modal distribution of the population solving the problem because the lower-strata individuals would be unable to organize information of the complexity of the higher strata.

Isaac's experiment, which was controlled for errors introduced by the instruments,[61] was conducted using subjects from secondary schools and universities. His tests confirmed multi-modal distributions of the capacity of the population.

"Separation of Two Adult Populations Identified with Two Levels of Psychological Development"[62] article documents Isaac's experiment using the idea of "loss of skill" to identify discontinuous groups of populations based upon their capability. The experiment confirms that a group of individuals (meeting all criteria) actually contains several distinct groups. Isaac's premise is that the individual loses the ability to operate and organize information under the rising levels of stress brought on by the increased rate in which the new information arrives requiring a decision to be made. Based on the test results, Isaac identified six distinct levels of information abstraction, revealing multi-

[60] Isaac, D. J. & O'Connor, B. M. (1978). Use of loss of skill under stress to test a theory of psychological development. London, U. K.: Heinemann Educational Books.

[61] Isaac constructed sophisticated mechanisms to control for errors – for an accurate description of the control mechanism please see his original essays, in which he described his experiments in such a detail that it would be possible to replicate all of his studies and tests.

[62] Ibid.

modality, and supporting the original premise of the discontinuous psychological development of humans.

In his fourth article, "A Discontinuity Theory of Psychological Development," [63] John Isaac discusses the theory that he constructed in 1962 and rigorously tested during the subsequent years. His premise is that psychological development is discontinuous, proceeding from a distinct and identifiable stage to another distinct and identifiable stage. Other theorists, such as Paiget, have suggested the discontinuity of psychological development but did not develop quantitative methods to test their suppositions. Isaac created quantifiable means to test his suppositions, the results and analysis of which are consistent his theoretical propositions. His theory is:

> …based on the idea that psychological development proceeds discontinuously; that is, individuals develop through a sequence of clearly discriminated stages or levels, the term "clearly discriminated" here implying a lack of intermediate forms between an earlier and later stage (p. 96).

Isaac gives three requirements for an "adequate" theory:

1. The theory must comprise a system of structures relating to a sequence of developmental stages.
2. The system of structures must provide quantitative statements. The theory must also provide ideas suggesting the general form of experimental procedure. (Isaac suggests ratio-scale quantitative measures rather than surveys, questionnaires, verbal reports, etc.)
3. The theory must be sufficiently abstract for the experiments designed to test it to be in no way related to the sources of the theory. From this, it follows that the theoretical work would be completed before experimental work commenced.

Isaac continues to describe his theory in general terms, identifying five distinct levels of psychological development and discussing empirical and rigorous tests, results of which confirm that the population studied belonged to one of the levels.[64] He used the premise that higher-level individuals could cope with higher-level problems and easily with lower-level ones, while lower-level

[63] Isaac, D. J. & O'Connor, B. M. (1978). A discontinuity theory of psychological development. London, U. K.: Heinemann Educational Books.

[64] Most of Isaac's research, particularly the mathematical theories he developed to describe these five orders of psychological development, the author believes, is lost. Mrs. Cason, who was friends with John Isaac (and a fellow researcher), has concurred the author's conclusion (Cason, Kathryn (2005). Personal Discussion). Even though the math behind Isaac's theories appears to have been lost, Isaac's findings closely and independently correspond to Jaques' findings of distinct levels of psychological development.

individuals could not resolve the higher-level-abstraction problems. Isaac also tested the loss of skill when the rate of information is increasing for the individual to make decisions correctly before the rate at which the complete loss of skill occurs. The higher-level individuals organized information better and achieved higher rates than individuals belonging to the lower levels of psychological development.

In addition, Isaac created mathematical descriptions for each level. All experiments were rigorously quantitative. All conformed to and were consistent with the original idea of the humans' discontinuous psychological development.

Fair Pay

Other short-term[65] independent studies have been conducted by several researchers correlating the size of the role in a managerial hierarchy and the pay the employee thought was fair for his or her role in the managerial hierarchy. All of these studies confirm Dr. Jaques' general theory of managerial hierarchy.

The fundamental premise for these studies is Dr. Jaques' finding that an employee in a managerial organization has an intuitive evaluation of the fair pay for his or her working role. Dr. Jaques' theoretical hypothesis is that the size of the role determines the felt fair pay (FFP), thus creating and proposing a proper pay structure that depends upon the size of the role, measurable via the time-span of discretion measurement instrument. The studies have also found a significant correlation (.89 to .95) supporting Dr. Jaques' premise that employees in different types of occupation (in the same geographical/economical area) report the same amount for the felt fair pay in diverse roles of similar sizes (as measured via the time-span of discretion measurement instrument).

Gould[66] (1984) tested the FFP hypothesis among librarians and found a significant correlation (correlation coefficient of 0.95). Having confirmed Dr. Jaques' premise and as suggested by a general theory of managerial hierarchy, Gould proposed a five strata organization of the library department, identifying and describing each role (and pay within the role). Boals[67] (1985) studied a similar phenomenon at the University of Southern

[65] Any study conducted within five years or less is considered in this paper to be a short-term study; only John Isaac's work has extended over a twenty-five year period.

[66] Gould, Donald Porter (1984). An examination of level of work in academic library technical services departments utilizing time-Stratified Systems Theory. Los Angeles, CA: University of Southern California.

[67] Boals, David Michael (1985). Levels of work and responsibility in public libraries. Los Angeles, CA: University of Southern California.

California. His research, independent of Gould's study, found a correlation between the size of the role and felt-fair pay at 0.95 correlation. Boals then summarized independent studies by Richardson (1971), Gould (1984), Jaques (1976), and himself stating:

> Taken together with the results of this study these findings provide persuasive evidence that there is a very strong relationship between time-span and fair pay. This mounting body of evidence, drawn from so many independent studies, suggests that the relationship between time-span and fair pay represents more than wishful thinking, poor study design, or researcher-induced bias (p. 116).

As part of his 1965 doctoral dissertation, Atchison[68] attempted to correlate "felt-fair pay" with Jaques' proposition of time-span of discretion to explain the phenomenon of felt fair pay correspondence with a possible range of other phenomena. After collecting and analyzing data, he concluded that Jaques' time-span of discretion provided a more consistent correlation than the two other variables—the classification method of job evaluation and the maturity curve method. Atchison writes:

> The time span of discretion was the only one of the three methods whose correlation with perceived equity[69] was substantially the same in both organizations. Thus, the time span of discretion gave the most consistent results from one organization to the other (p. 3).

Jaques' "felt-fair pay" proposition is that employees in managerial organizations working in similar and/or diverse roles with corresponding time-spans (in a comparable geographical and economical location) report identical amounts they feel would be a fair compensation in their roles. Atchison's independent scientific research and findings confirm one of the predictions of a general theory of managerial hierarchy.

Roy Richardson[70] (1971), as part of his doctoral dissertation at the Southern Illinois University, studied the correlation of felt fair pay with the size of the role in a managerial organization. He evaluated the GTMH[71] premise that people occupying diverse occupation roles of a similar role stratum, measured by the TSD

[68] Atchison, Thomas Joseph (1965). A comparison of the time span of discretion, a classification method of job evaluation, and a maturity curve plan as methods of establishing pay differentials for scientists and engineers using perceived equity as a criterion. Seattle, WA: University of Washington.

[69] The "perceived equity" term that was used by Atchison is Jaques' felt fair pay.

[70] Richardson, Roy (1971). Fair pay and work: an empirical study of fair pay perception and time span of discretion. Carbondale and Edwardsville: Southern Illinois University Press.

[71] GTMH stands for Jaques' General Theory of Managerial Hierarchy.

(time span of discretion measurement instrument), should report similar felt-fair-pay amounts, presuming the same geographical location. Richardson's research demonstrates this finding and empirically confirms Jaques' theoretical proposition. Richardson's general hypothesis is that "there is a direct, linear relationship between TSD as measured by the manager and the FFP as perceived by the subordinate" (p. 45). Richardson found a correlation at 0.862, "clearly" confirming his main supposition and supplying additional support for the a general theory of managerial hierarchy.

Confirmation by a Report for the U.S. Department of Defense

Gillian Stamp[72] of Brunel University completed a longitudinal study in 1988 for the United States Department of Defense. His research, "Longitudinal Research into Methods of Assessing Managerial Potential," tested and confirmed Jaques' organizational theory, then called Stratified Systems Theory. Stamp tested two premises of Jaques theory: first, that human capability grows and matures at different accelerating rates and second, that the levels of work are discontinuous. Of his research, he writes:

The research described in this report… provides further confirmation for these hypotheses:

1. The hypothesis that there is discontinuity between levels of complexity in work and in individuals.
2. The hypothesis that adults do develop… at broadly predictable rates, and that there are differences between individuals. (pp. 37-38)

Stamp continues with his final conclusion that his report is a "confirmation and in some ways, an extension of Stratified Systems Theory" (p. 38).

Change in Small Business

King[73] (1997) investigated the effects of predecessors' and successors' potential capabilities on the changes in performance (adjusted gross sales) in small businesses, comparing the results three years before succession with three years after the succession.

[72] Stamp, P. Gillian (1988). Longitudinal research into methods of assessing managerial potential. Alexandria, Virginia: U.S. Army Research Institute for the Behavioral and Social Sciences, Cameron Station.

[73] King, Sandra West (1997). Managerial leadership capability and organizational performance: the relationship between predecessors' and successors' potential capability and organizational performance following a succession in family-owned businesses. Washington, DC: The George Washington University.

King's conclusions confirm the implications of a general theory of managerial hierarchy: that a business leader's potential capability (PC) is a significant factor in determining the success or failure of the business. King writes: "The difference in PC between predecessor and successor was significantly associated with business performance in the third year following succession" (p. 82). She recommends using Jaques' theory in overall planning for succession in family-owned small businesses, having validated some of the implications of the theory, such as capability effects on the leadership changes in family-owned small businesses.

Satisfaction in the Workplace

Nyberg (2004), as part of her doctoral dissertation, completed a study on people's satisfaction in the workplace based on the several criteria of the general theory of managerial hierarchy.[74] Particularly, she investigated whether a person's capability corresponding to the complexity of the role had any relationship to the person's overall satisfaction with his or her role in the managerial organization. Nyberg's study found support for this relationship concluding that when the person's capability matches the complexity of the role, the employee is more satisfied with the role he or she is performing within the organization.

United States Presidents

Alison Brause, a doctoral fellow at The University of Texas at Austin, as part of her doctoral work, has completed a creative and scientific study testing one of the implications of a general theory of managerial hierarchy regarding the human capability to deal with information complexity by evaluating United States presidential candidates' capabilities as a predictive factor in winning the general elections.[75] The main proposition of the study was that the major party candidate demonstrating the highest capability wins the general elections. The highest level of capability was determined using Jaques' evaluative method of analyzing the complexity of an argument's structure by each presidential candidate and classifying the argument into one of the strata of information processing (see figures 2 and 4 in Chapter 1, pages 1-5 and 1-8).

[74] Nyberg, Beverly J. (2004). The Impact of Person-Job Role and Person-Superior Fit on Employee Satisfaction. Washington, DC: The George Washington University.

[75] Brause, Alison (2000). An investigation of presidential elections using Jaques' construct of mental complexity. Austin, TX: The University of Texas at Austin.

After analyzing presidential debates, Brause (2000) determined that in five out of seven elections, the candidate with the highest stratum capability has won the election. In the other two elections, in which the candidates' capability strata were the same, the younger candidate became the president of the United States, consistent with the theoretical prediction that the younger candidate has a higher future potential capability.

Applicable Theoretical Discussion
St. Augustine and Alvin Toffler

…such considerations are too remote in time to consider them. The fact that the plant could trigger devastating ecological consequences a generation later simply does not register in their time frame… Their time horizons must be extended…. Every society faces not merely a succession of *probable* futures, but an array of *possible* futures, and a conflict over *preferable* futures.[76]
Alvin Toffler

St. Augustine's[77] work is directly related to Jaques' theories through his analysis of the time phenomenon. He questions the use of the word "time" in everyday language and tries to understand what is meant when we speak about time-related concepts, such as past, future, and present. He asks the questions, "what is time, and what is future or present." His argument is that the past is something that is no more, so it does not exist. The future is something that is still not, so it also does not exist. He focuses on understanding what is meant by "past month" or "future month" and concludes that neither exists. St. Augustine then divides the time periods to weeks, days, hours, minutes, and seconds and demonstrates that neither past nor future exists. Thus, according to St. Augustine, even though we use the time concept in our language, physically this concept does not exist, except for the continuous ever-going present, which encompasses present past and present future.[78]

Further, in his analysis, St. Augustine asks where the future is, and how it is that some can predict the future. His conclusion is that the future is not in the future, but it is in now, in the present. Understanding complex relationships and intentions allows us to

[76] Toffler, Alvin (1970). Future shock. New York, NY: Random House.
[77] Saint Augustine (1961). Confessions. New York, NY: Penguin Books.
[78] St. Augustine goes further in his analysis and attempts to understand change and time in relationship to God, concluding that time does not exist for God; therefore, what happened "before time" is meaningless. He interestingly hints that there is no such thing as time except for the ever-continuous present. He continues to imply that since God resides "outside time," then so does humanity. (This last note is, of course, the author's interpretation.)

see "in the future" because we can predict how the present events may unravel.

Jaques believed that his own work builds on St. Augustine's ideas of the concept of time in developing his own theories. He agreed that neither past nor future exists; rather, both past and future exist in the continuous present—the present past and present future. Dr. Jaques uses St. Augustine's concepts of time to define life[79] and apply the concept to a general theory of managerial hierarchy to demonstrate the five dimensional world of the living organism (3 spatial dimensions and 2 time dimensions: clock-time and the time of intention). In 1982 he writes, "Past, present and future… are modes of organization of our current mental experience in terms of time"[80] (p. 76).

> In 2002 Dr. Jaques continues: St. Augustine, about 500 A.D…recognized that past, present, and future were merely psychological states, namely, the past comprised our memories, the present our current observations, and the future our anticipation or desires[81] (p. 240).

Based on this analysis and building upon St. Augustine's premise, Dr. Jaques proposed a five dimensional analysis of the social phenomena (human beings and organizations) rather than four dimensional of the physicist. He argued that: "A 5-D world (three spatial and two time dimensions) really is necessary for locating a person engaged in work"[82] (p. 241).

Alvin Toffler,[83] a respected futurist, has concluded that the revolution in social sciences will come only with the new understanding of time. In his book, Future Shock, Toffler (1970) conveys an idea similar to those proposed by St. Augustine and Dr. Jaques: "…it is time to erase, once and for all, the popular myth that the future is 'unknowable' "[84] (p. 408). He demonstrates how governments and corporations attempt to identify various possible futures and makes assertions that some of the predictions, short- and long-term, are accurate. He points out that these predictions are based on examining the current events and trends. Toffler's analysis is identical to St. Augustine's in that he asserts that the future is in the present and is based on current unfolding events.

[79] Dr. Elliott Jaques defines and build a theory of life in one of his major works, first published in 2002, in the book called "The Life and Behavior of Living Organisms: A General Theory."
[80] Jaques, Elliott (1982). The form of time. New York, New York: Crane, Russak & Company.
[81] Jaques, Elliott (2002). The life and behavior of living organisms: a general theory. Westport, CT: Praeger Publishers.
[82] Ibid.
[83] Toffler, Alvin (1980). The third wave. New York, NY: Bantam Books.
[84] Toffler, Alvin (1970). Future shock. New York, NY: Random House, Inc.

Alvin Toffler [85] (1980) further maintains that significant temporal differences exist in the three waves of modern civilization—the agricultural, industrial, and information age. The term "time" was understood and used in an entirely different manner in these distinct civilizations.

In the agrarian society, Toffler writes, time was not synchronized and was not precise. "Agricultural populations developed remarkable precision in the measurements of long spans of time… but seldom developed precise units for measuring short spans… a farmer might refer to an interval as a 'cow milking time'" (p. 103). The agricultural society generally understood time as a cyclic phenomenon.

In the second wave, [86] the industrial revolution dramatically changed the temporal understanding of society; it synchronized and "made time linear" (p. 104). Toffler writes: "Synchronization. Standardization. Linearization" brought massive changes to the society (p. 105). Toffler believes that the second wave synchronized and mechanized the society in time—everyone had to report to work at the same time, take breaks at the same time, and stop working at the same time because the assembly line could not support any unsynchronized pattern of getting something done.

The third wave has again dramatically changed the temporal dimension of society. Toffler discusses the introduction of "flex-time" to the workplace. The mechanical synchronization of the second wave, prevalent during the industrial society, was replaced by a more individualized time required and implemented within the society. (p. 246)

Following Toffler's analysis and St. Augustine's propositions, Toffler's fourth wave might be the temporal change Dr. Jaques has suggested in the new understanding, and most importantly, new usage of time in modern society. A dynamic concept of time of intention and the five-dimensional world may bring a change to the modern societal order as well as the organization and composition of society. Both Toffler and Jaques call for longer time-horizons for the modern society and agree that the future lies in the present past. Toffler argues that each new civilization (and its rise) requires and has a different understanding and concept of time, which Dr. Jaques has proposed (the Toffler's time-requirement for the

[85] Toffler, Alvin (1980). The third wave. New York, NY: Bantam Books.

[86] Toffler calls the agricultural revolution the First Wave, the industrial revolution the Second Wave, and the post-industrial present the Third Wave. He writes (1980): "The First Wave of change – the agricultural revolution – took thousands of years to play itself out. The Second Wave – the rise of industrial civilization – took a mere three hundred years. Today history is even more accelerative, and it is likely that the Third Wave will sweep across history and complete itself in a few decades" (The third wave, p. 10).

modern civilization) – a five-dimensional world based on St. Augustine's work.[87]

Kurt Lewin

Even though Lewin's studies were completed in the 1930s, his deep understanding and analyses of the field and its needs remain current today and explain much regarding the millennia of the mode of thought in psychology and social sciences, dating back to Aristotle and Galileo, and continuing to present day.[88] Lewin (1931) in The Conflict Between Aristotelian and Galilean Modes of Thought in Contemporary Psychology discusses their major differences of philosophies and draws conclusions about modern psychology. He also identifies the needs of the modern psychologists to look toward the Galilean development of social sciences. He maintains that the Aristotelian mode of thought is static and unable to explain the dynamic behavior of people and points out that modern psychology is still being hindered by the Aristotelian mode of thought.

Lewin predicts that the science of psychology will change its philosophy to the Galilean method, which is more precise, dynamic and rigorous and so more useful in the development of modern natural sciences. Lewin writes: "The dynamic problems of physics were really foreign to the Aristotelian mode of thought." He further claims that modern psychology is static in nature but the underlining phenomenon, in effect, is dynamic.

In one of his most profound and fundamental points, Lewin identifies the need for dynamics in social sciences, which is a fundamental premise for the Galilean thought and opposite the static and imprecise thought of Aristotle. He continues to assert that "teleology assumes a direction of events toward a goal" and gives examples of a child who has two tempting items—a toy and candy—in front of him and the choice the child has to make to obtain one over the other.[89] Lewin stops short of differentiating a natural science event and the social science event, even though he speaks of vectors and goals, which is very close to Jaques' ideas and theories. Lewin does not differentiate between the living

[87] Dr. Jaques has also found support for his 5-D world idea in the writings and understanding of time by ancient Greeks – in his book, The life and behavior of living organisms, he writes about *kairos* and *chronos* – the two words for time used by Greeks, which are identical to Dr. Jaques' time-dimensions of intention and clock (pp. 240-241). He also talked about the work of Confucius to demonstrate that his own discoveries have been used and discovered by other people, some of them, long-ago.

[88] Kurt Lewin's work is seminal in psychology and illuminates the contemporary state of thought on modern social sciences and standing issues to be resolved in psychology in general.

[89] Lewin never explained why the child had to pick one of the objects rather than both.

organisms attempting to achieve a goal(s) and goal-less physical phenomena.

Furthermore, Lewin faults the Aristotelian mode of thought in psychology for its inability to apply the theory concretely to specific situations. Jaques refers to it as "a most serious test of reduction of the theory to tangible applications." Lewin writes that psychology cannot predict the behavior of a specific child at a specific moment. Similarly, Jaques writes that any fifth order[90] theory should be reducible to all lower orders to the very first order of information complexity and be applied concretely in first order tangibles. The theory must be able to predict a specific event in a specific situation, such as the behavior of a specific individual at a specific moment of time and place.[91] Lewin, though less poignant than Jaques, contends that modern psychology is Jaques':

> …hollow high sounding words devoid of lower level complexity content, and unable to explain the occurrence of a particular case, and by this is meant not the behavior of an abstractly defined "average child," but, for example, the behavior of a certain child at a certain moment.

In summary, Lewin believes that the social sciences of today face the same limitations as the Aristotelian theory. He suggests that we turn more to the Galilean mode of thought in psychology, a more dynamic, precise science. Although Lewin does not identify the precise dynamic goal, he does echo Jaques' dynamic approach and theories.

Jean Piaget

In his article, "The Theory of Stages in Cognitive Development," Piaget asserts that all children develop through definable and discontinuous stages.[92] He writes, "we postulate four major periods in development" (p. 2). Piaget's description of each stage resembles Jaques' four stages—declarative, cumulative, serial, and parallel modes. To support his theory of stages in child development, Piaget gives examples of specific logical problems that a child developed to a certain stage is able to resolve, but a child who has not matured to that stage cannot. Piaget writes:

> At certain ages the child is able to solve the problems in quite specific areas. But if one changes to another material or to another situation, even with a problem which seems to

[90] Please refer to figure 2 above for the chart describing the orders of information complexity.
[91] Jaques, 2002. Orders of complexity.
[92] Piaget, Jean (1971). The theory of stages in cognitive development. New York, NY: McGraw-Hill Book Company.

> be closely related, lags of several months are noted, and in some cases even of 1 or 2 years (p. 10).

Piaget's observations are that the child would not be able to resolve a certain logical problem until he or she has matured to a certain stage of development. Overall, Piaget's research and findings support Jaques' findings of discontinuous development of humans. The only difference is that Piaget's theory applies to children, while Jaques' spans human development from birth to old age.

Non-Scientific Critique
Dr. Harry Levinson

> Dr. Harry Levinson is a recognized authority in the United States on management, psychology, and organizations. He is chairman of the Levinson Institute and professor emeritus of Harvard Medical School and has achieved many recognitions and awards from a variety of organizations, academia, and other societies, including the American Psychological Association.[93]

Because of the small quantity of written critiques and studies of a general theory of managerial hierarchy, the author interviewed several well-known management authorities to learn their impressions of the theory, its shortcomings, and its logic. The first interview[94] was on April 25, 2002, with Dr. Harry Levinson, who knew of only one book in the United States critiquing Dr. Elliott Jaques' theories, and it was published in the 1970s. According to Dr. Levinson, Dr. Jaques' theories have not been widely critiqued for the following reasons:

1. Because the theories require a different way of thinking and training and not many industrial psychologists have studied them.
2. Because Dr. Jaques' theory is "very complex" to study and comprehend; it would take executives some time to even begin to understand the theory. Also, the theory is foreign to the orientation of the industrial psychology.
3. No follow-up dissertations or Ph.D. studies investigate, test, and generally carry the theory forward.

According to Dr. Levinson, these three reasons are why practically so very few have worked on Jaques' theory. He believes the theory is so complex that no one is really knowledgeable or familiar enough to develop it.

[93] (2002). The Levinson Institute. http://www.levinsoninst.com: World Wide Web.
[94] Levinson, Harry (2002). Interview on Elliott Jaques' theories.

Despite these barriers, Dr. Levinson contends that Dr. Jaques has been more innovative and thoughtful on the logic of management and its implications than anyone else he knows. Overall, he believes, that Dr. Jaques has made a "tremendous contribution."

He also believes that Dr. Jaques was so heavily involved with the theory that he denied psychology and people's feelings, which, Dr. Levinson argues, are not irrelevant. Dr. Levinson asked whether a paranoid person is going to feel right in the requisite organization.[95] Another question Dr. Levinson raised is about promoting people, which may lead to narcissistic and omnipotent views regardless of how the logical structure of the organization is, and this could upset the entire organization's functioning. This is an example of how individual psychology comes into the picture and how it may create problems with Dr. Jaques' theory. Dr. Levinson says that if he were to write a critique of the theory, a major issue would be that the theory does not address the individual's psychology.

Dr. Levinson declares that the Jaques' requisite organization's structure is logical and should be adopted and applied to evolve into a more useful structure. He believes that CEOs should recognize how to manage change and filter it down their organizations, but he feels that this is one of the theory's shortcomings because it does not address the change process—how to push change from above to make people adapt. People may have to deal with loss and cope with the changing responsibility. For most organizations, change is complex and needs to be managed sensitively.

Regarding Jaques' theory that capability changes with age, Dr. Levinson believes that this proposition is possible. Also, he believes that organizations would benefit by promoting according to the level of the current potential capability, e.g., a person who has matured to stratum 4 (capability) and presently occupies a stratum 3 role should be trained and then promoted for a stratum 4 role.

Dr. Peter Vaill[96]

Dr. Peter Vaill, formerly a professor of Management Science of The George Washington University, who recently served as distinguished chair in Management Education at the Graduate School of Business, University

[95] Requisite Organization is the actual result (structure, design, etc.) of a general theory of managerial hierarchy applied to a managerial organization.

[96] http://www.phd.antioch.edu

of St. Thomas, is currently a professor of Management at Antioch University. An author of more than 50 journal articles and a book, Learning as a Way of Being: Strategies for Survival in a World of Permanent White Water, published in 1996,[97] Dr. Vaill is considered an expert and authority in the field of management.

The interview with Dr. Vaill took place on December 5, 2002. Admitting that he has not studied Dr. Jaques' theories for the past five or six years, he nonetheless stated that he believes GTMH lacks evidence for a strong correlation between the level of work and current potential capability of the person. For example, Dr. Vaill feels that it is possible for a person whose current potential capability is stratum 3 to work successfully in the stratum 5 role. Dr. Vaill believes that the current potential capability is not the only factor in determining whether the executive can or cannot do the job; instead, he says, there are many other factors to consider when deciding the person for the executive role.

Dr. Vaill thinks that Dr. Jaques' theories are too extreme, too absolute, and too rigid (and thus, in his eyes, disqualify themselves) to grow and to be adopted in the field.

Dr. Gilles Amado[98]

Dr. Gilles Amado is a professor in Organizational Psychology in the HEC School of Management in France. He holds a Ph.D. in Clinical Psychology from Université de Paris II, France, and has published an article in the journal Human Relations critiquing Jaques' approach to organizations.

In his critique of a general theory of managerial hierarchy, Amado[99] (1995) argues against Jaques' approach because he does not use psychoanalysis or the study of unconsciousness in the organizational consultancy. Amado believes that both are vital to the study of organizations. Jaques[100] (1995) responded to Amado's critiques, explaining why the psychoanalytical approach is dysfunctional and hurtful to organizations and people in them.

Jaques' major point is that organizations:

> …are not understood. There are differences between various types of organizations. The paranoiagenic environment that exist in organizations is not caused by the unconscious processes of individuals comprising the

[97] http://www.academy.umd.edu/scholarship/casl/klspdocs/follower_contributors.htm
[98] http://www.hec.fr
[99] Amado, Gilles (1995). Why psychoanalytical knowledge helps us understand organizations; a discussion with Elliott Jaques. Human Relations, 48(4), pp. 351-357.
[100] Jaques, Elliott (1995). Why the psychoanalytical approach to understanding organizations is dysfunctional. Human Relations, 48(4), pp. 343-349.

> organization, but rather the improper design of the organization, undefined authorities and accountabilities, mismatch between roles and people's capabilities—all these create negative aspects or symptoms that psychoanalytical approach is trying to address, which overall, fixing symptoms is dysfunctional and unrealistic.

Jaques gives an example of the dysfunctional organization of organizational consultants/psychoanalysts.

Christopher Ridgeway[101] (1997) responded to the debate between Jaques and Amado by suggesting that they should reconcile both arguments as the organizational consultants are already very confused by what and how to advise their clients and they need to appear more respectable in the eyes of their clientele. He believes that such debates hurt organizational consultants and, therefore, should not continue. Ridgeway[102] voices a trend among the academicians that has gained support and agreement from many organizational and management theorists. The author's own personal experience at several national and international academic conferences verified the resistance to any new theory in the field of management. During discussions on the need for a testable theory in the field of organizations, the author noticed an adamant disapproval by several colleagues who argued that there is no need for theory because the social sciences are different from the natural sciences. They further argued that organizations today are already doing well, so no new theories, especially testable propositions, are required. The author is concerned that this trend, which seems to promote organizational consultants, may be hurtful and unethical to people who work in organizations.

Dr. James R. Meindl

Dr. James R. Meindl[103] was the Donald S. Carmichael Professor of Organization and Human Resources at the School of Management of the University of Buffalo, The State University of New York. He held a Ph.D. from the University of Waterloo, and published a review[104] of the

[101] Ridgeway, Christopher (1997). Some brief comments on the Jaques-Amado debate. Human Relations, 50(6). pp. 751-755.

[102] Christopher Ridgeway is an organizational consultant. He published his article in the same journal shortly after Dr. Amado and Dr. Jaques debated the approach to study and consult with organizations. The author considers Ridgeway's article to be an important contribution and believes that it illuminates serious flaws in the modern approach of organizational consultants.

[103] Meindl, James R. (2004). Faculty Biography Pages. www.mgt.buffalo.edu/CFDOCS/Forms/faculty/bios/faculty.cfm?fac=meindl: World Wide Web.

[104] Meindl, James R. (1994). Strategic Leadership: A Multiorganizational-Level Perspective. The Academy of Management Review, 19(2), 345-348.

> Strategic Leadership book [105] in the Academy of Management Review critiquing the Stratified Systems Theory described and addressed by the book.[106]

Meindl's review of the Strategic Leadership book is considered by some management authorities as a serious critique of Jaques' works. Boal (2004) writes, "Meindl questions the importance of the book since, in his view, Jaques work was not important."[107]

Even though Meindl's review appears critical of Jaques' Stratified Systems Theory (SST), he harshly critiques the book's failure to present the theory rather than Jaques' work itslef. Meindl writes:[108]

The editors state that SST is deceptively simple. The simple part is covered in the book. The deceptive part is not well exposed for readers… Reading the rest of the volume requires high tolerance for ambiguity and a willingness to play with loosely formulated (or at least presented) theory… the editors wanted to bring SST into the center stage of the strategic management and leadership research. I am not sure this volume accomplished that.

Overall, Meindl does not say anything about SST besides that the book, which was not written by Dr. Jaques or his colleagues, does a poor job explaining the fundamentals of SST, and he regrets a 'half-hearted' effort by the book's authors to demonstrate how SST has influenced their own work, when in fact, it did not.

Most authors of the book themselves do not understand the fundamental principles behind Jaques' theories, and claim that SST is deficient based on their incomplete understanding of the fundamentals of the theory. One of the authors of the book, Boal (1992), builds a complex argument that SST does not deal adequately with time, and suggests that the time perspective must be improved. Boal writes, "the SST perspective is overly simplistic… by focusing on only the calendar time of feedback, SST has not addressed other equally important aspects of time: synchronization, sequence, rate, and allocation… we have argued that a broader conception of time needs to be incorporated in SST" (p. 242-243, 253).[109]

It is possible that Boal is correct regarding the time phenomenon, but her premise is too general and could apply to any

[105] Phillips, Robert L.;Hunt James G. (1992). Strategic Leadership: A Multiorganizational-Level Perspective. Westport, CT: Quorum Books.
[106] It has become known to the author that Dr. James R. Meindl has recently passed away.
[107] Boal, Kim (2004). Personal Communication.: e-mail.
[108] Meindl, James R. (1994). Strategic Leadership: A Multiorganizational-Level Perspective. The Academy of Management Review, 19(2), 345-348.
[109] Phillips, Robert L., Hunt, James G. (1992). Strategic Leadership: A Multiorganizational-Level Perspective. Westport, CT: Quorum Books.

theory. Boal echoes Alvin Toffler, who argues that each new civilization understands time differently and structures its work around the new understanding of time. Toffler continues that large-scale progress occurs when time is understood differently from a previous generation. Countering Boal's critique, Jaques has offered an entirely new understanding of time (time of intention), which has become one of the most fundamental principles behind the theory, and developed a five-dimensional world of a biological organism.

The author tends to agree with Meindl that the book Strategic Leadership, at the minimum, requires a serious revision, and, in its present version, is a rather confusing and misleading critique of Jaques' theory.[110]

Summary

Alvin Toffler, in his book, Creating a New Civilization, argues that all ideas must be accepted for a communal discussion to create a new twenty-first century civilization. He writes:

The responsibility for change lies within us…. This means fighting off the idea-assassins who rush forward to kill any new suggestion on grounds of its impracticability, while defending whatever now exists as practical, no matter how absurd, oppressive, or unworkable it may be…we have a destiny to create. (p. 108)

This chapter has summarized the foundations of the organizational theories Dr. Elliott Jaques has developed, and it has identified several independent scientific critiques of the theories, all of which have confirmed Jaques' theoretical propositions.

The core of a general theory of managerial hierarchy is built on two factors—complexity of information and time of intention—that characterize all living (sentient) organisms trying to achieve certain goals while juggling and understanding the dynamic and changing information available. Humans, the most advanced organisms in terms of ability to plan things further into the future, appear to process information in distinct modes, differentiated by the capability to which a member has matured. According to the data, most human adults mature to Order 3 of five[111] orders of the

[110] The author also wonders how come Dr. Elliott Jaques refused to contribute to Strategic Leadership – it is the author's hunch that the main reason is that the book misses, misguides and confuses the theorists interested in Jaques' theories.

[111] In his book, The life and behavior of living organisms, Dr. Jaques (2002) describes six orders of information complexity. Shortly after publishing the book, Dr. Jaques revised his thinking and asserted that there are only five orders of information complexity because he could support only the first five orders with actual data; also, his description of the 6th

information complexity band. Within each order of the complexity band, Dr. Jaques has identified four distinct strata. Some humans mature to a higher order of capability, Order 4 (occupying strata 5 through 8), and are capable of managing more complex situations.

These strata, 1 through 8, according to the theory and supporting data, are distinct and identifiable, naturally creating a certain type of organization of human labor—managerial hierarchy. A general theory of managerial hierarchy addresses dynamic issues of design and structure as well as other human issues in this type of organization. Furthermore, Dr. Jaques discovered a way to employ ratio-scale measurements to determine the size of the role in this managerial hierarchy, in order to develop the theory so that it is precise, testable, and predictive.

This paper, in addition to presenting a summary of a general theory of managerial hierarchy, has included known critiques and independent studies of the theory and its predictions. All of the independent studies show support for the theory, and none of the theorists have disagreed scientifically with the theory. A 25-year study in the nature of discontinuity in human capability, undertaken by John Isaac, has confirmed Jaques' propositions. Piaget' Theory of Stages in Cognitive Development also supports Jaques' findings of discontinuous human development in children. Other shorter-term endeavors include doctoral dissertations, most notably by Sandra King of The George Washington University, Allison Browse of The University of Texas at Austin, and Thomas Atchison of the University of Washington. These dissertations tested some aspects of the theory and confirmed Jaques' findings.

Non-scientific critiques of the theories are also mentioned in this paper to give a broader analysis of the general discussions. However, as Stephen Hawking asserted, only scientific work makes a longitudinal difference in the field. It is the author's conclusion that more scientifically based studies need to be initiated to refine, test, and study the propositions and assumptions of the theories. At present, however, independent research and studies have confirmed all of Jaques' propositions.

According to Hawking, the Aristotelian mode in natural sciences lasted until the early 1900s until Einstein published a scientific paper[112] offering an explanation of a certain natural event in which he scientifically and objectively asserted could be explained by particles moving and colliding. Until Einstein's paper

order applies to the 5th order – this is an important—but unpublished—revision to his latest edition of the theory of life.

[112] Hawking, Stephen W. (1988). A Brief History of Time: From the Big Bang to Black Holes. New York, NY: Bantam Books.

in 1905, debates and discussions between the atomists and Aristotelians continued, without either school prevailing. Similarly, it is the author's belief that more scientific studies of a general theory of managerial hierarchy should be initiated in order to test the new school of thought that Dr. Jaques has offered and developed.

Kurt Lewin (1931) compares the Aristotelian mode of thought in psychology to the Aristotelian mode of thought in natural sciences and suggests that the static mode of psychology must give way to a dynamic school of thought. He begins but does not finish his theory on vector psychology[113] (which is in agreement with Jaques' theories, except that Dr. Jaques has developed and refined the ideas further).

Analogously, it took almost 200 years after Galileo's discovery of how to measure acceleration that the Aristotelian mode was replaced with modern physics. Dr. Jaques discovered the time-span measurement instrument in the early 1960s to measure the size of the role in a managerial hierarchy (with ratio-scale values). If history is to be the indicator of the future (which according to St. Augustine may not be the most accurate way to predict the present events), it may well take some 100 to 300 years after Jaques' discovery of the time-span instrument of intention measurement that the Aristotelian mode of thought may be replaced with modern social sciences. Then, Kurt Lewin's search for a dynamic mode may well be over with the first complete, testable, and science-based dynamic organizational theory, a general theory of managerial hierarchy.

Chapter 3.

[113] Kurt Lewin's death right after World War II, in 1947, is likely the main cause for the unfinished theory on vector psychology.

Methodology

Overview

This chapter describes the methods, research design, and pilot study employed in the research endeavor. This chapter first describes the design and methodology, and then proceeds to the description of the completed pilot study by the author which tested methodology and data analysis techniques for the main research study. The procedures and techniques used are based on Jaques' general theory of managerial hierarchy.

This study aims to test and advance Jaques' general theory of managerial hierarchy (GTMH). The study investigates Jaques' finding of Manager-Subordinate Relationship (MSR) in managerial hierarchies. The researcher, using a clinical research approach, surveyed existing managerial organizations, thus, conducting a field study, which satisfies the research and theory testing/advancement because the studied phenomenon is universal according to the theory and applicable (according to the theory) to all managerial systems worldwide.

Description of the Research
Research Design and Methodology

The research question is whether there is a relationship between Jaques' Manager-Subordinate Relationship (MSR) and structuring of roles in the managerial hierarchy (the manager's role is one stratum higher the subordinate's). This phenomenon, in effect, constitutes the effective managerial relationship in the managerial hierarchy according to Jaques' general theory of managerial

hierarchy. Manager-Subordinate Relationship (MSR) describes how a subordinate, in a managerial hierarchy, feels towards the manager, and how the manager feels towards the subordinate – it is an empirical finding by Dr. Elliott Jaques of the criterion for effective management. Optimum MSR is achieved when the subordinate feels *just right* towards the manager – the subordinate is comfortable towards the manager's directions, communications, and overall feels that the relationship is as it should be. In Optimum MSR, the manager also feels right towards the subordinate that the subordinate understands the manager's directives, and that the subordinate's manager is not "pulled down into the weeds" (p. 11).[114]

In the non-Optimal Manager-Subordinate Relationship (non-OMSR) (non-effective management according to the theory), the subordinate reports either that the manager is *too close*, or *too far*. When the subordinate feels that the manager is too close – the manager is breathing down the subordinate's neck. When the subordinate feels that the manager is too far, the subordinate feels that the manager is not providing the directions s/he should, and feels lost.

The manager, in non-OMSR, also reports either of the two conditions: that the subordinate is either too close or too far. The manager feels too close when the subordinate does not listen nor need directions – the manager cannot set a context for the subordinate's work because the subordinate is ready to assume the manager's role. The manager feels too far when the subordinate pulls the manager "down into the weeds" – the relationship feels uncomfortable because the subordinate's need for directions pulls the manager into unnecessary levels of details to set the context for the subordinate's work – the manager feels that there should be another manager between him/her and the subordinate.

The study's premise is that there is a relationship between the requisite working stratum of manager and subordinate and Optimum MSR, and non-requisite structuring and non-OMSR.

MSR (Managerial Hierarchy) = {too close, too far, just right}

In other words, the above expression states that the manager-subordinate relationship in a managerial hierarchy belongs to one, and only one of the following relationships: too close, too far or

[114] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

just right, the latter premise constituting the phenomenon of effective management.

The data collected in this study will contain the measured level of work (role stratum) of managers and subordinates in managerial hierarchies. It is possible to measure the level of work of each individual in the managerial hierarchy with a ratio-scale measure (by interviewing the individual's manager – see chapter 1 and appendices 1 and 2 for a complete description of the measuring process). Having measured the roles of manager and subordinate, the roles are matched with the appropriate stratum (Ivanov, 2002)[115].

The following table summarized the strata and time bands for each stratum.

Table 3.1. *Time-Span of Discretion Period*

Time-Span of Discretion Period	Stratum of the Role
1 day – 3 months	Stratum 1
3 months – 1 year	Stratum 2
1 year – 2 years	Stratum 3
2 years – 5 years	Stratum 4
5 years – 10 years	Stratum 5
10 years – 20 years	Stratum 6
20 years – 50 years	Stratum 7
50 years – 100 years	Stratum 8

The measure for the stratum 1 role would fall within the limits of one day and three months, stratum 2 – between one year and two years, and so on as depicted in the above table. The study's proposition is that when the manager's role is exactly one stratum above the subordinate's role, both, the manager and subordinate should feel just right about their manager-subordinate relationship (OMSR). When the manager's role is more than one stratum higher than the subordinate's role, both, the manager and subordinate should report too far about their manager-subordinate relationship (non-OMSR), and when the manager's role is within the same stratum as the subordinate's role is, both will report feeling too close about their manager-subordinate relationship.

Research Question 1

The following analysis would satisfy the study's Research Question 1. Having collected data and determined the working

[115] Ivanov, Sergey. "Recommendations for the Practical Use of Elliott Jaques' Organizational and Social Theories in the Information Technology Field: Teams, Software, Databases, Telecommunications and Innovations." (2002)

stratum and the MSR, it is possible to draw a correlation between the requisite layering of manager and subordinate and the MSR. Finding/not finding a correlation would test Jaques' general theory of managerial hierarchy in its ability to predict (or not predict) the MSR in managerial hierarchies.

Research Question 2

The following analysis would satisfy the study's Research Question 2. As a secondary research question, the researcher attempts to discover the effects of the capability of manager and subordinate on the MSR as defined by Jaques and Cason[116]. The exploratory proposition is that MSR correlates strongly when the manager's role is one stratum higher than the subordinate's role, and additionally, the manager's current potential capability (CPC) corresponds with the manager's role stratum, and the subordinate's current potential capability corresponds with the subordinate's role stratum.

Selection of Subjects

The subjects will be selected from one or more managerial hierarchies. The only criterion for selecting a sufficient number of cases would be the ability to run appropriate statistical analysis to ensure that the sample-size is appropriate for the statistical techniques used in the analysis – the statistical techniques and rationale are explained in depth in the section below (section 3.2.6 on page 3-13), Data Processing and Analysis.

Any subject employed in the managerial hierarchy is constituted to be a valid case to study and collect data because a general theory of managerial hierarchy postulates universal principles pertaining to all managerial systems not depending on sex, culture, region and/or any other factor except that the person is being employed in a managerial-type organization. Thus, for the purpose of this research, any managerial organization (with a sufficient-enough number of cases for conducting statistical tests) will suffice to explore and test the research questions.

Sample Justification

This study does not use the random sampling technique because according to the theory each sample is representative of the

[116] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.

population (general theory of managerial hierarchy postulates that the MSR and stratification of work are universal phenomena). The fundamental essence of having a random sample is to ensure that threats of biased and unrepresentative samples do not impact the study and its outcomes; random sampling is a technique that helps create a sample that represents the population so that the outcomes of the study and its conclusions could be generalized to the population.

There is no need for the random sampling technique in this study because any sample represents the population of managerial systems precisely (according to the theory). According to a general theory of managerial hierarchy, all managerial hierarchies can be evaluated similarly based on the level of work (role stratum) of its employees in working roles, thus, allowing comparing various organizations in geographically different parts of the world and/or of various industry-types. Measuring the level of work of employees is universal (according to the theory), and thus, any sample based on the principles of a general theory of managerial hierarchy theory should represent the population of managerial hierarchies, thus, making the study generalize-able.[117]

The researcher will attempt to collect approximately thirty cases[118] in order to run the statistical techniques deployed (and described in the analysis section below) for the analysis; thirty-cases would be considered a sufficient sample[119] to be error-prone and generalize-able to the population of managerial hierarchies.

Instrumentation

The main instrument to be used in this study is *time-span of the role*, also called *time-span of discretion*. The time-span of the

[117] Measuring the size of the role in various types of managerial organizations is analogous to measuring temperature in different parts of the world – in both cases, the measuring instruments allow obtaining data for comparison and analysis. Given, there may be a specific research investigating the differences that occur in different geographic areas when the measuring results are the same, but the author's current research endeavor does not investigate the differences between managerial hierarchies of 'same' roles – this would be a future effort built on the results of this present research.

[118] Nonetheless, the research is using the purposive strategic sampling technique and will collect data from the managerial organization(s) selected purposely – technology-oriented as the study has originally started to investigate the managerial structures in the information technology organizations, but the theory allows wide generalizations to all types of managerial hierarchies, thus, all cases, not necessarily related to information technology, will also be included in the study's sample.

[119] Collecting more than thirty cases also may not feasible because of lack of time and financial resources available to the investigator. Future work would ideally include more cases. The researcher will try, though, to collect as many cases as possible, and if feasible, will attempt to proceed beyond thirty-cases.

discretion measures the size of the role in managerial hierarchies with ratio-scale data – the complete description of this instrument is available in the Jaques' "Time-span Measurement Handbook."[120] The size of the working role, also called the level of work, or working stratum of the subordinate is measured by asking the subordinate's manager about the longest project or assignment that the manager delegates to the subordinate, and is defined as the "targeted completion time of the longest task or task sequence in the role."[121] The time-span of discretion instrument's measuring unit is time – minutes, hours, days, months, years, and so on.

Once the size of the subordinate's role has been determined, it is translated into a stratum, to identify the stratum of the subordinate's role, as shown in Table 3.1 on page 3-3. Once the strata of manager and subordinate are determined, it is possible to calculate how many strata are between the manager's and subordinate's role, which is the independent variable in the analysis.

The managers and subordinates will also answer questions how they feel towards each other after being explained what *too close*, *just right*, and *too far* outcomes are of the manager-subordinate relationship. The manager will answer confidentially whether the subordinate feels to be too close, too far, or just right, and the subordinate will answer (also confidentially) whether the manager is too far, too close, or just right, thus, enabling to evaluate the optimum and non-optimum outcomes of the manager-subordinate relationship, constituting the relationship's effectiveness. In this research, each outcome of the MSR is not going to be evaluated to the strength of the feeling. For example, reports such as close, a little close, and similar will all be evaluated and reported as too close – the strength of the MSR is deferred for future research. Similarly, all responses in the too far category, such as a little far, far, and the like will also be generalized to and reported in the too far MSR category.

Additionally (as a secondary research question), using the methodology used by Jaques and Cason in the research described in the "Human Capability" book[122], current potential capabilities of managers and subordinates will be evaluated. The Manager-Once-Removed (MoR), Manager (M), and Subordinate (S) will be asked about S' potential capability to work at the next managerial level had the S had (right now) all the necessary skills, knowledge and experience. Knowing the working stratum of the M and MoR, it is

[120] Jaques, Elliot (1964). Time-Span Measurement Handbook.
[121] Jaques, Elliot (2002). The Life and Behavior of Living Organisms: a General Theory.
[122] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.

possible to translate the potential capability of the S to the potential role stratum. This process follows Jaques' field procedures described in his Human Capability book.[123]

To evaluate the M, who does not have a M or MoR – for example, a CEO or President of the company, the potential capability of this person could be evaluated using an alternative method, also described in the "Human Capability" research by Jaques and Cason[124] – the person could be engaged a discussion in which the interviewee is going to evaluate the patterns of the argument that characterize each stratum. Having engaged the interviewee in a spontaneous discussion (the interviewee will be asked to rate afterwards his/her involvement on a scale from 1 (engaged the least) to 5 (engaged the most) (per suggestion of Cason)[125] to determine the maximum stratum of the composed spontaneous argument corresponding to the potential capability stratum (when the person is engaged strongly into the discussion). This latter method, however, is not going to be used in this research for a variety of reasons, including that the CEO or President may indeed be capable at working in *Stratum n + 1*, but is 'restricted' by the Board of Directors, and thus, is forced to work in *Stratum n* instead. Furthermore, having the current potential capability to work in *Stratum n + 1*, does not necessarily guarantee the person is actually working in this stratum due to personal, health, and other reasons. When possible, the researcher will attempt to interview the corporate Board to determine the level of work of the President or CEO of the company, if the opportunity presents itself, otherwise, these cases will not be part of the study (though will be retained in the database for future research).

Field Procedures

Each interview to take place is relatively short. The following types of people employed in managerial hierarchies are to be interviewed: S, M and MoR.

The interview with subordinate takes approximately 5 minutes[126]. The researcher will ask the person about his/her potential capability, and verify the time-span of the subordinate's role learned when interviewing the subordinate's immediate manager – this verification was suggested by Dr. Elliott Jaques to double-check and prevent errors – every attempt will be made to

[123] Ibid.
[124] Ibid.
[125] Cason, Kathryn (2002). Personal Discussion.
[126] The researcher's data recording sheet is included in the appendix in the end of this chapter.

reconcile significant differences in responses.[127] For example, if M says that time-span for subordinate's role is 3 years, and subordinate thinks that it is 3 days, then the researcher will re-interview the manager and subordinate to learn if this is a researcher's interviewing error. The responses that are approximately the same (fall within the same stratum) – 5 months by manager/3.5 months by subordinate are considered acceptable as both responses indicate the same level of work and that both, manager and subordinate consider the subordinate's longest assignment at roughly the same discretionary time-lengths.

It may seem strange that both, M and S, could report different outcomes pertaining to the subordinate's longest assignment – the theoretical justification for this possible outcome is that the time-spans of assignments are (generally) not explicitly specified by managers to subordinates as most organizations nowadays are not requisite, though both, manager and subordinate have a gut-feel-limit what could be the maximum length of time by which the assignment must be completed within the discretionary powers of the subordinate – a complete description of the process and roles is available in the "Requisite Organization" book[128] by Dr. Elliott Jaques.

The last inquiry to the subordinate will be about his/her feeling towards the manager – too close, too far, or just right, after a sufficient explanation of each type of MSR.

When interviewing the manager, the researcher will ask about potential capability (just like the subordinate was asked), and also about his/her thinking about the longest assignment to verify the time-span of the manager's role derived from interviewing his or her immediate manager. Furthermore, the manager will be interviewed in regards to all subordinates reporting to him/her (with the exception of secretary/administrative/executive assistants)[129] to measure the level of work of each of the subordinates with time-span of discretion. The researcher will also ask about the potential capabilities of each of the subordinates, and the types of MSR towards each subordinate and immediate manager.

[127] Jaques, Elliott (2001). Personal Communication.

[128] Jaques, Elliott (1996). Requisite Organization: A Total System for Effective Managerial Organization and Managerial Leadership for the 21st Century. Arlington, Virginia: Cason Hall & Co..

[129] Secretaries and administrative/executive assistants represent 'special' roles within the managerial hierarchy, and should be excluded from the analysis. GTMH suggests that a mismatch in strata could be high for a good and effective relationship between a manager's role in stratum n+1 and his or her secretary's role in stratum n-1.

When interviewing MoR, the interview will include the entire interview of manager, and in addition, the MoR will be asked about the potential capability of the subordinates-once-removed (SoRs).

Data Collection and Recording

All of the data collected will include the following:[130]

All Participants:
1. Age of the participant
2. Gender
3. Experience in the role (how long the participant has worked in the position)
4. Age of the manager-subordinate relationship (how long the subordinate has been reporting to the manager in the present roles)

Subordinate:
1. Verification of the Subordinate's Time-span of Discretion (time-span of the role).
2. Felt current potential capability (of him/herself).
3. Type of MSR towards the manager (too close, too far, or just right).

Manager:
1. Time-span of Discretion for roles of each subordinate.
2. Verification of own time-span of discretion.
3. Felt current potential capability (of him/herself).
4. Type of MSR towards each subordinate.
5. Type of MSR towards his/her manager.
6. Felt current potential capability for each subordinate.

Manager-once-Removed:
1. Time-span of Discretion for roles of each subordinate.
2. Verification of own time-span of discretion.
3. Felt current potential capability (of him/herself).
4. Type of MSR towards each subordinate.
5. Type of MSR towards his/her manager.
6. Felt current potential capability for each subordinate.
7. Felt current potential capability for each subordinate-once-removed.

[130] The sample size and sampling technique is described in detail in section 3.2.2.2 on page 3-5.

In addition, the researcher will record in a narrative format employees' unusual stories, explanations and everything additional people share to retain so that later on this additional information could possibly help explain and interpret the study's analysis of quantitative data.[131]

All of the data will be recorded confidentially on the data-recording sheet (see appendix 9 for this form). Afterwards, all data will be recorded in the proprietary database application developed by the researcher in order to organize and store the data in a manner most applicable for analysis. Furthermore, all data in the database is going to be verified again (on a different day) against the paper-recorded information in order to eliminate data-entry errors (by the researcher), and ensure all information corresponds.

The researcher obtained the permission from The George Washington University's Office of Human Research, to conduct the research and collect the data specified. This study has been approved by the Institutional Review Board (IRB) of the Office of Human Research, which has legally bound all data to be absolutely confidential; the study's IRB number is U110411ER.[132]

Data Processing and Analysis

The data to be processed will be stored in a proprietary database designed by the researcher, implemented in the Microsoft Access 2003 DBMS[133]. Once the data[134] has been verified in the database by the researcher, the SPSS statistical package (student version SPSS 9.0) will be used to build a correlation to test the strength of the relationship between the difference of working strata of manager and subordinate, and the MSR.

The following ordinal-scale variables will be derived from data for the testing of the main proposition:

1. Manager's Role Stratum, M(RS)
2. Subordinate's Role Stratum, S(RS)
3. Subordinate's MSR-type towards the manager, S(MSR)
4. Manager's MSR-type towards the subordinate, M(MSR)

[131] During the pilot study one employee said that she purposefully worked in a lower stratum role than was her capability because she wanted to spend more time on Yoga, community service and her family.

[132] This previous IRB number that was approved for this study was U070228.

[133] DBMS stands for Database Management System.

[134] The word *data* in this study will be treated as a singular entity; at the present time the word data is used sixty-percent in singular form (Dictionary.com), and this study will adhere to this new language trend.

Role Stratum (RS) is the ordinal-scale evaluation[135] of the phenomenon. It is an ordinal-scale because all stratum are positioned in order, and defined strictly within a certain time-band, in an increasing order from Stratum 1 to Stratum 8 (within the third and fourth order of information complexity), as depicted on figure 5 and table 3.1 (both abave).

The types of manager-subordinate relationships are also considered an ordinal-scale evaluation. According to the proposition of a general theory of managerial hierarchy, the order of MSR types are determined by the differences of manager's role stratum and subordinate's role stratum, such as, if the M works in stratum 4, and subordinate works in stratum 3, the difference between the strata is 1, according to which the theory would suggest "just right" type of MSR between both, the manager and subordinate; thus the study is going to conduct two tests, one correlating actual subordinates' MSR with the suggested by the theory, and the other – managers' MSR correlating with the suggested theoretical outcome.

Furthermore, if the difference of strata is more than 1, the theory suggest a "too far" MSR for both, the managers' reported data, as well as subordinates'. The larger the difference is, the more distant and strong this type of MSR becomes, growing from "a little too far," "too far," to "really too far."

Similarly, the "too close" type of MSR is equally ordered by the difference of strata (and the closeness within the strata), as follows: "a little too close," "too close," "really too close." The first state, "a little too close," could happen when one or both roles are on the border of the next stratum, for example, S in low 2, while the manager in high 2/border stratum 3. When the gap is closer, the stronger reporting of "too close" is suggested by the theory.

This study, though, does not concern about the strength of MSR types – this is deferred to future work, and all reports belonging to a specific MSR will be aggregated under one MSR type, such as "really too far," "too far," and "a little too far" will be aggregated under the "too far" type.

In summary, according to a general theory of managerial hierarchy, the smaller the difference is between the level of work of manager and subordinate in the "too close" type of MSR, more "too close" the subordinate and manager feel towards each other. Similarly, the bigger the difference between the level of work of

[135] The word *measure* is reserved strictly for ratio-scale types of data; all other uses of other types of data, such as nominal, ordinal and intervals are called evaluation (in this study).

manager and subordinate is in the "too far" type of MSR, the more distant the manager and subordinate will feel toward each other.

The following data will be collected for analysis:[136]

Time-span of the Role, t(r)→ Ratio-scale, time →converted into Ordinal scale, stratum
Manager's Role Stratum, M(r)
Subordinate's Role Stratum, S(r)

Manager-Subordinate Relationship → Ordinal scale, MSR type
MSR of S toward M, S(MSR)
MSR of M toward S, M(MSR)

Current Potential Capability, c → Ordinal scale, stratum
Manager's Current Potential Capability, M(c)
Subordinate's Current Potential Capability S(c)

Time-span of the role will be converted into the ordinal-type data because the research hypothesis is that MSR is effected by the difference of strata of manager's and subordinate's roles, and not the precise time-span within each stratum. Thus, having prepared the ordinal scale data for analysis and study the strength of the correlation between the dependent (MSR) and independent (difference of strata) variables, the research will use the correlation methods to test the strength of the relationship between these variables.

Research Question 1

The first test will be run to test the correlation between the roles of manager and subordinate, and the subordinate's MSR. The second test will be run to test the correlation between the roles and the manager's MSR.

Kendall's and Spearman's correlations will be used as the primary analysis techniques because the independent and dependant variables are of ordinal scales (regression requires interval/ratio-scale data, and thus, will not be used in this analysis). Kendall's rank correlation (Kendall tau_b)[137] as well as Spearman's rho (on a confidence level of 95%) will determine if there is a correlation, and its strength. The researcher is using Kendall's tau

[136] Cases where the age of the manager-subordinate relationship or the person's time in the role has been too short will be reported (Chapter 4), but they will be excluded from the analysis (for example, when the subordinate has been a recent appointee and worked only for one day or one week in the role).

[137] (2005). Kendall's rank correlation. [Retrieved from].

coefficients to state the strength of all relationships. Kendall's tau is considered to be more meaningful than Spearman's rho because it "measures the strength of dependence between two variables."[138]

No correlation[139] would indicate a possible deficiency in the theory, while a statistically significant correlation would confirm a possible validity of the theory, and will advance it by indicating whether or not Jaques' MSR is possibly related to roles in managerial hierarchies.

After the survey is completed, the difference of working strata of manager and subordinate is calculated. For example, if the manager's role is stratum 4, and the subordinate's is stratum 3, this is the requisite relationship according to Jaques' theory, and is the difference between roles is 1.

MSR is coded as follows: too far (2), too close (0), and just right (1). According to the theory, expected (theory-predicted) MSR in a requisite relationship is just right (1). If the relationship is not requisite, for example, too close, then predicted MSR is 0, and if too far, then 2. Actual MSR values are collected during the survey, thus, analysis will compare actual MSR with expected.
The following table[140] will be entered into SPSS to run the analysis:

Table 3.2. *Actual/Expected MSR Example*

Actual MSR (received during survey)	Expected (theory-predicted) MSR, Based on Roles of Manager and Subordinate
just right	too close
just right	too close
too close	just right
just right	just right
too far	just right
just right	just right
too close	just right
just right	too close
just right	too far
too far	just right
just right	just right
just right	just right
just right	just right
just right	too close
too close	too close
too close	too close
just right	too close
too far	too close
just right	too close
just right	just right
just right	just right

[138] (2005). Kendall's rank correlation. [Retrieved from].
[139] Both correlations are analyzed in Chapter 4.
[140] This table is only an example the author has made up to demonstrate how results may look.

just right	just right
too far	just right
too far	too far
too far	too far

To answer Research Question 2, the table above will be reconstructed where the manager's role stratum corresponds to the manager's current potential capability, and the subordinate's role stratum corresponds with the subordinate's current potential capability.

Research Question 2

As a secondary research question, the researcher will attempt to discover a stronger relationship between the difference of strata (n) and S(MSR) where manager's current potential capability (M(c)) and subordinate's current potential capability (S(c)) correspond to the level of work, or in other words, where M(c) = M(r) and S(c) = S(r). Additionally, if the data is sufficient, the researcher will attempt to discover a stronger relationship between the difference of strata (n) and M(MSR) where M(c) = M(r) and S(c) = S(R). Both tests, if successful, would be theoretical and empirical advancements to a general theory of managerial hierarchy.

Methodological Assumptions and Limitations

The first assumption, which is largely philosophical, is borrowed from Dr. Elliott Jaques' "The Life and Behavior of Living Organisms" book[141], in which he articulated one of the most fundamental core assumptions of his theories, which is that *the world the living organisms observe exists independently of the observers*:

> "any organisms of any species… will operate… as to show evidence of observing… the same physical boundaries, and in the same state of movement. In light of this phenomenon of commonly shared entification… there must be a real world out there…" (148).

Assuming the world exists independently of us, the following methodological assumptions and limitations tender this study, as follows (with explanations in the next paragraph): the study is limited to managerial hierarchies only, recording error, time-span measurement error, researcher/interviewee fatigue, interviewee lying and computational error.

[141] Jaques, Elliott (2002). The Life and Behavior of Living Organisms: a General Theory. Westport, CT: Praeger Publishers.

At first, this project is limited to managerial hierarchies only, which is a generalize-ability limitation in terms that the results could only be generalized to one type of organizations – managerial accountability hierarchies, which is exactly designed as such by the study to explore a general theory of managerial hierarchy, which applies specifically to this type of organizations only.

The recording error of the researcher will be avoided from occurring using the following strategies: verifying interviewees' answers, double-checking the entered data into the study's database with the paper-based collected information, and double-checking the database information again. Verifying interviewees' answers is important and will be conducted in the following manner in respect to measuring the size of the role: the subordinate's level of work will be measured by interviewing his/her immediate manager; in addition when interviewing the subordinate, the researcher will ask a verifying question about the subordinate's level of work. Both answers should match or be close to one another – if there is a discrepancy, the researcher may re-interview the individuals to ensure that the correct data was recorded.[142] In addition, to prevent recording errors, the researcher will do his best to come rested to the interview and be most attentive to ensure that in fact the answers heard are recorded properly.

The time-span measurement error will be prevented by verifying the level-of-work as explained in the paragraph above, as well as the researcher's fatigue. Furthermore, experience has shown that an average interview takes between 5 to 10 minutes, which is a relatively short time to enter the fatigueless state; same applies to the interviewee fatigue – a relatively short interview should not pose a risk of fatigue.

The researcher will also attempt to prevent interviewee deception by verifying the answers of other interviews. Should there be a discrepancy in the reported time-span of the role, the researcher will re-interview to ensure that none of the above errors have occurred (both, the subordinate and manager should be in a relative agreement about the same factual things, such as the size of the subordinate's role). The research questions are also not intrusive and do not demand any sensitive information, and thus, should not normally cause excessive stress, anxiety, ecstasy/glory or any other feeling motivating people to deceive. Also, the

[142] This verification was suggested to the author by Dr. Elliott Jaques during the design of the study.

researcher expects to interview normal people working in normal managerial organizations, and thus, there should not be any reason to deceive, particularly, considering that all responses are confidential.

The last possible error that could potentially lead to erroneous results is a computational mistake. In order to prevent computing errors, the data will be analyzed several times on different days to ensure that there is no accidental computing error, for example, researcher's clicking on the wrong button.

Overall, having evaluated the error threats to the study, the researcher will employ strategies to prevent these errors from occurring and minimize their impact on the study.

Pilot Study

The researcher conducted a pilot study between April 2001 and August 2002 to assess the feasibility of the research questions, data collection, and methodology. Dr. Elliott Jaques assisted the researcher in initiating and completing the pilot project as part of an advanced management course[143] at The George Washington University.[144]

In addition to assessing the viability of the entire research endeavor, the study allowed the researcher to learn specific, but important, how-to details of a general theory of managerial hierarchy, for example how to measure the time-span of discretion in various roles.

The researcher conducted 172 interviews in 15 organizations worldwide, 12 in the North America and 3 in Europe. Having conducted the interviews, the researcher disqualified most of the cases due to learning: there were interviews in which the researcher did not collect enough data, etc., but overall the entire exercise served a useful "learning" purpose and a proof of concept. Twenty-nine cases, with complete and accurate data, were selected for analysis.

Pilot Study Results

Research Question 1

Twenty-nine cases were analyzed with the SPSS statistical package. The 29 raw data cases constituted valid cases testing the correlation between roles of manager and subordinate, and

[143] The author has successfully completed this class in the fall of 2002 – see Dr. Elliott Jaques' note in the appendix.

[144] Jaques, Elliott (2001). Management 398 Graduate Course. Washington, DC: The George Washington University.

subordinate's MSR; the correlation exists and is significant at the 95% confidence level. The correlation strength is 0.378, which indicates a relationship, but not as strong as the researcher expected.[145]

Research Question 2

The researcher performed an additional test correlating the subordinate's MSR with the roles of manager and subordinate, where the subordinate's current potential capability corresponded with the subordinate's role stratum, and the manager's current potential capability corresponded with his/her role stratum (the study's secondary research question). In this case, the preliminary data shows there is no correlation. Also, there were only ten cases identified when the capabilities of managers and subordinates matched their roles; many employees' capabilities were bigger than the organizational roles in which they worked.

Pilot Study Conclusion

The goal for the pilot study was not to produce interpretable results and/or advance a general theory of managerial hierarchy; the goal of the study was strictly to evaluate the feasibility of the entire research endeavor (data collection, methodology, analysis), and to test whether the study is doable; the effort proved the study to be feasible.

The pilot study demonstrated that it was possible to collect necessary data and analyze it scientifically, and obtain meaningful and interpretable results. The current results received will not be counted into the study's conclusion; because the researcher was learning and making mistakes while collecting data. The pilot study was completed after the investigator achieved and mastered and perfected the practical methods of data collection (as directed by Jaques).

In addition, the pilot study not only shows that the study is possible, it also hints at a possibility of a major break-through advancing the theory, such as obtaining a possible evidence whether the requisite alignment[146] of organizational roles is sufficient for an effective managerial hierarchy. The entire research

[145] The researcher is using Kendall's tau coefficients to state the strength of all relationships. Kendall's tau is considered to be more meaningful than Spearman's rho because it "measures the strength of dependence between two variables" ((2005). Kendall's rank correlation. http://www.statsdirect.com/help/nonparametric_methods/kend.htm: StatsDirect).

[146] A manager's role is one stratum above the subordinate's role.

holds the possibility of a significant theoretical and practical advancement.

Summary

In summary, the methodology and tests for the study have demonstrated that the research is feasible. Furthermore, to ensure the study has minimized errors, portions of the research have been refereed, published and presented at several national and international conferences (see appendix 8). The author believes that the study is scientifically strong, and has the potential to produce a possible advancement within a general theory of managerial hierarchy, which could be applicable and usable by modern organizations, and in particular – managerial hierarchies.

Chapter 4.
Results

Participants

Seven corporations participated in the research, three in the United States in the Washington DC metropolitan area, and four in Riga, Latvia (a recently independent republic of the former Soviet Union). The following subchapters briefly describe each organization, but do not identify them. The research cannot identify and disclose participants for a variety of reasons, including guaranteed confidentiality of every participant, competitive information, and university regulations.[147]

United States

There were three companies participating in the United States in the Washington DC region (companies US1, US2 and US3).[148] Two different divisions of Company US3 participated independently. These divisions invited the author separately from each other, as independent entities. They are located in different buildings, and do not interact with each other; they report to different management structures within the company, and perform distinctively different organizational functions. The researcher,

[147] This study has been approved by the Institutional Review Board (IRB) of The George Washington University's Office of Human Research; the study's IRB number is U110411ER

[148] The investigator collected data for all of the organizations in the United States in September/October 2005.

therefore, reported them separately as Company US3a and Company US3b.
Additionally, it is important to note that none of the companies above have ever heard of or used Dr. Elliott Jaques' requisite design principles in their practices; thus, all companies surveyed are non-requisite.

Company US1

Company US1 is a family-owned and operated business run by a husband, whose title is President, and his wife, whose title is CEO. Neither husband nor wife report to each other, and their titles in respect to each other are rather misleading because they work as partners managing different aspects of the business; the husband tends to be the real CEO of the entire company managing most day-to-day operations and developing new businesses strategically. The husband runs all of the various (external) divisions of the business, while his wife manages HR and accounting. All of the VPs report directly to the President (husband). They both started the business in 1987, and since then it grew to a multi-million-dollar-corporation operating globally: Europe, South America, and Asia (among several locations in the United States). The researcher investigated the headquarters (located in the Washington DC metro area), which employs most of the employees and hosts the main divisions.

Company US2

Company US2 is a government agency. The investigator surveyed most employees in this organization, which is run by a board of elected officials. This organization consists of medical professionals, most of whom have been with the organization for many years.

Company US3a

Company US3 is a large multi-national corporation located in Northern Virginia. The researcher investigated (independently) two diverse division of this organization, and thus, the researcher chose to report them separately as Division A and Division B (below). Division A provides professional information technology support services, and tends to operate globally, though the researcher surveyed only employees in the United States.

Company US3b

Division B is different from Division A. Besides being located in a different location, these divisions perform different strategic functions within the company through different management structures altogether. The researcher felt that it was most proper to report and analyze these structures separately.

Latvia

The researcher visited Riga, Latvia in March 2005. Four Latvian companies participated; one is local, one operates in the Baltic countries (Latvia, Lithuania, Estonia), and two are global corporations.[149]

Company L1

Company L1 is a family-owned and operated business in Riga, Latvia. The owners were excited to participate in the research because they participated in the author's earlier investigation (the pilot study in May 2002).[150] Much has changed since 2002; in 2002 the husband ran the entire business, but since then the wife took over, and the husband appears no longer to participate actively in day-to-day operations, except for strategic decisions.

Company L2

Company L2 is also a family-owned and operated business, also run by husband and wife. The family-dynamics structure is almost identical to Company L1: the wife runs the entire business, while the husband helps with strategic decisions. Company L1 and L2 are also competitors in some areas of their business.[151]

Company L3

Company L3 is a local franchise of a large global company. The local franchise conducts business in the Baltic countries as well as Russia. This corporation operates globally: in the United States, Europe, and Australia.

Company L4

[149] The researcher mostly used English or precise Russian translation for non-English speakers (the researcher speaks English and Russian natively); though many people in Latvia tend to be fluent in English.

[150] The author described this pilot study in chapter 3.

[151] The author cannot reveal the nature and specifics of each business because they would be easily identifiable by people living in these areas; also the owners' of these businesses are followed by the paparazzi in Riga, and so, the researcher wants to avoid unwanted publicity to his private and confidential research participants.

Company L4 is a global European company with a branch in Latvia. This corporation operates all over the world, including the United States, Europe, and Russia.

Research Question 1

The research question is whether there is a relationship between Jaques' Manager-Subordinate Relationship (MSR) and the requisite structuring of the managerial hierarchy (the manager's role is one stratum higher than the subordinate's). Manager-Subordinate Relationship (MSR) describes how a subordinate, in a managerial hierarchy, feels towards the manager, and how the manager feels towards the subordinate – it is an empirical finding[152] by Dr. Elliott Jaques of the criterion for effective management. Optimum MSR is achieved when the subordinate feels *just right* towards the manager – the subordinate is comfortable towards the manager's directions, communications, and overall feels that the relationship is as it should be. In Optimum MSR, the manager also feels right towards the subordinate that the subordinate understands the manager's directives, and that the subordinate's manager is not "pulled down into the weeds" (p. 11).[153]

In the non-Optimal Manager-Subordinate Relationship, the subordinate reports that the manager is either *too close* or *too far*. When the subordinate feels that the manager is too close – the manager is breathing down the subordinate's neck. When the subordinate feels that the manager is too far, the subordinate feels that the manager is not providing the directions s/he should, and feels lost.

The manager, in non-Optimum MSR, also reports either of the two conditions: that the subordinate is either too close or too far. The manager feels too close when the subordinate does not listen nor need directions – the manager cannot set a context for the subordinate's work because the subordinate is ready to assume the manager's role. The manager feels too far when the subordinate pulls the manager "down into the weeds" – the relationship feels uncomfortable because the subordinate's need for directions pulls the manager into unnecessary levels of details to set the context for the subordinate's work; the manager feels that there should be another manager between him/her and the subordinate.

[152] Even though Jaques discovered these relationships in his research-consultancy practice, he has never been able to test them. This study is the first to test these specific Jaques' theoretical propositions.

[153] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

The study's premise is that there is a relationship between the requisite working stratum of manager and subordinate and MSR.

The data collected in this study contains the measured level of work (role stratum) of managers and subordinates in managerial hierarchies. It is possible to measure the level of work of each individual in the managerial hierarchy with a ratio-scale measure (by interviewing the individual's manager – see Chapters 1 and 3, and Appendices 1 and 2 for a complete description of the measuring process). Having measured the roles of manager and subordinate, the researcher matched the roles with the appropriate stratum (Ivanov, 2002)[154]. The researcher conducted the correlation tests of the strength of the relationship between the stratification of work roles (roles)[155] of manager and his/her subordinate and the manager's MSR towards the subordinate, and the subordinate's MSR towards the manager.[156]

All Cases

The analysis demonstrates that there is a statistically significant relationship between the roles of manager and subordinate, and the manager's MSR, the roles and the subordinate's MSR. For example, if the manager's role stratum is 5 and subordinate's is 3, according to Jaques' theory, the manager should feel *too far* from the subordinate, and the subordinate similarly towards the manager. If the manager's role stratum is 4 and subordinate's 3, they both should feel *just right* toward each other.

The data demonstrates support for these Jaques' propositions. At the 99% confidence levels, the research can conclude that there is 25.5% correlation between the roles and managers' MSR towards the subordinates, and 24.7% correlation between the roles and subordinates' MSR towards their managers.[157]

[154] Ivanov, Sergey. "Recommendations for the Practical Use of Elliott Jaques' Organizational and Social Theories in the Information Technology Field: Teams, Software, Databases, Telecommunications and Innovations." (2002)

[155] Instead of saying stratum of the role (or roles' strata), the researcher will use the term *role* to specify the stratum of the role.

[156] For example, the manager's role stratum is 4, and the subordinate's is 3. Thus, according to Jaques' theory, the manager should experience the Optimum MSR towards the subordinate (just right), and the subordinate should similarly experience the Optimum MSR towards the manager (because the difference of their working strata is one stratum, as Jaques would have recommended).

[157] The researcher is using Kendall's tau coefficients to state the strength of all relationships. Kendall's tau is considered to be more meaningful than Spearman's rho because it "measures the strength of dependence between two variables" ((2005). Kendall's rank correlation. http://www.statsdirect.com/help/nonparametric_methods/kend.htm: StatsDirect)

There also appears to be a statistically significant relationship between the manager's MSR and subordinate's MSR on the 95% confidence level, with the correlation of 18.5%.

The following terms and abbreviations were used to report (and code) data definitions in the "SPSS 12.0 for Windows" statistical analysis software and in this chapter:

Table 4.1 . *Terms and Abbreviations Used*

Term	Description
N	Number of cases
Mgr2Sub	MSR of Manager towards the Subordinate
Sub2Mgr	MSR of Subordinate towards the Manager
Role	Stratum of the Role

The following table summarizes the results for research question 1:

Table 4.2. *Summary of Results for Research Question 1*[158]

RESEARCH QUESTI ON 1					
	TOTALS:[159]	Companies:[160]			
		All Cases:			
	US & Latvia				
N	*99*				
Mgr2Sub	!5.5% (at 99%)[161]				
Sub2Mgr	24.7% (at 99%)				
		United States:			
	US	*US1*	*US2*	*US3a*	*US3b*
N	*49*	*25*	*6*	*15*	*3*
Mgr2Sub	*No correlation*[162]	*No correlation*	Sample too small	42.9% (at 95%)	Sample too small
Sub2Mgr	*No correlation*	*No correlation*	Sample too small	53.5% at (95%)	Sample too small
		Latvia:			
	Latvia	*L1*	*L2*	*L3*	*L4*
N	*50*	*4*	*15*	*11*	*20*
Mgr2Sub	37.3% (at 99%)	Sample too small	*No correlation*	75% (at 99%)	*No correlation*
Sub2Mgr	43.1% (at 99%)	Sample too small	*No correlation*	58% (at 95%)	47% (at 95%)

United States

The analysis of collective data in the United States demonstrates that there appears to be no statistically significant relationship between the roles and the MSR of either manager or subordinate.

[158] The researcher is using Kendall's tau coefficients to state the strength of all relationships. Kendall's tau is considered to be more meaningful than Spearman's rho because it "measures the strength of dependence between two variables" ((2005). Kendall's rank correlation. http://www.statsdirect.com/help/nonparametric_methods/kend.htm: StatsDirect).

[159] TOTAL represents the aggregate (total) number of cases summed together as N specifies (99 total cases, 49 for US, and 50 for Latvia).

[160] US1 means that results belong to US Company 1, L1 that results belong to Latvian Company 1, etc.

[161] 25.5% (at 99%) means that the strength of the correlation is 25.5% at the 99% significance level.

[162] *No correlation* means that the researcher has found no statistically significant correlation.

Company US1

The analysis of data for Company US1 demonstrates that there appears to be no statistically significant relationship between the roles and the MSR.

Company US2

Company US2 does not have enough cases to conduct analysis.

Company US3a

The analysis demonstrates that there is a statistically significant relationship between the roles and the MSR. At the 95% confidence levels, the research can conclude that there is 42.9% correlation between the roles and managers' MSR towards their subordinates, and 53.5% correlation between the roles and subordinates' MSR towards their managers.

Company US3b

Company US3b does not have enough cases to conduct analysis.

Latvia

There appears to be statistically significant relationships between the roles and the MSR of manager and subordinate. At the 99% confidence levels, the research can conclude that there is a 37.3% correlation between the roles and managers' MSR towards their subordinates, and 43.1% correlation between the roles and subordinates' MSR towards their managers.

Company L1

Company L1 does not have enough cases to conduct analysis.

Company L2

The analysis of data for Company L2 demonstrates that there appears to be no statistically significant relationship between the roles and the MSR.

Company L3

There appears to be statistically significant relationships between the roles and the MSR of manager and subordinate. At the 99% confidence level, the research can conclude that there is a 75% correlation between the roles and managers' MSR towards their subordinates, and at the 95% confidence level there is a 58% correlation between the roles and subordinates' MSR towards their managers.

Company L4

There appears to be statistically significant relationships between the roles and the MSR of the subordinate. At the 95% confidence level, the research can conclude that there is a 47% correlation between the roles and subordinates' MSR towards their managers, but no correlation between the roles and managers' MSR towards their subordinates.

Research Question 2

The study's secondary (exploratory) research question attempts to discover the effects of current potential capability of manager and subordinate on the MSR as defined by Jaques and Cason.[163] The exploratory proposition of the secondary question is whether MSR correlates strongly when the manager's role is one stratum higher than the subordinate's role and the manager's current potential capability (CPC)[164] corresponds with the manager's role stratum, and the subordinate's current potential capability corresponds with the subordinate's role stratum.

All Cases

There appears to be a statistically significant relationship between the roles (matched with current potential capability), and the MSR of subordinate, but no statistically significant relationship between the roles and the MSR of manager. At the 99% confidence levels, the research can conclude that there is 56.7% correlation between the roles and subordinates' MSR towards their managers. The following table summarizes the results for research question 2:

Table 4.3. *Summary of Results for Research Question 2*

RESEARCH QUESTION 2					
	TOTALS: *All Cases: US & Latvia*	Companies:			
N	*21*				
Mgr2Sub Sub2Mgr	*No Correlation* 56.7% (at 99%)				
	United States:				
	US	*US1*	*US2*	*US3a*	*US3b*
N	*5*	*1*	*0*	*4*	*0*
Mgr2Sub	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small
Sub2Mgr	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small

[163] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.

[164] Jaques defines the term current potential capability as "a person's highest potential capability in the sense of the maximum level at which someone could work at the present time, given the opportunity to do so and provided that the work is of value to him/her, and given the opportunity to acquire the necessary skilled knowledge." (Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.)

	Latvia: Latvia	*L1*	*L2*	*L3*	*L4*
N	*16*	*1*	*11*	*1*	*3*
Mgr2Sub	*No Correlation*	Sample too small	*No Correlation*	Sample too small	Sample too small
Sub2Mgr	63.4% (at 99%)	Sample too small	67.1% (at 95%)	Sample too small	Sample too small

United States

The US companies studied do not have enough cases to conduct analysis; there weren't enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum

Company US1

Company US1 does not have enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum.

Company US2

Company US2 does not have any cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum.

Company US3a

Company US3a does not have enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum.

Company US3b

Company US3b does not have any cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum.

Latvia

There appears to be a statistically significant relationship between the roles and the MSR of subordinate, but no statistically significant relationship between the roles and the MSR of manager. At the 99% confidence levels, the research can conclude that there is 63.4% correlation between the roles and subordinates' MSR towards their managers.

Company L1

Company L1 does not appear to have enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum (only one case).

Company L2

There appears to be a statistically significant relationship between the roles and the MSR of subordinate, but no statistically significant relationship between the roles and the MSR of manager. At the 99% confidence levels, the research can conclude that there is 67.1% correlation between the roles and subordinates' MSR towards their managers.

Company L3

Company L3 does not appear to have enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum (only one case).

Company L4

Company L4 does not appear to have enough cases in which a manager and subordinate work one stratum apart, and their current potential capabilities match their working stratum.

Summary

Having conducted research in the United States in the Washington DC metropolitan area, and Riga, Latvia, the researcher has found the following results, summarized in the table below as follows:

Table 4.4. *Summary of Results*

		RESEARCH QUESTİON 1			
	TOTALS:	Companies:			
	All Cases:				
	US & Latvia				
N	*99*				
Mgr2Sub	25.5% (at 99%)[165]				
Sub2Mgr	24.7% (at 99%)				
	United States:				
	US	*US1*	*US2*	*US3a*	*US3b*
N	*49*	*25*	*6*	*15*	*3*
Mgr2Sub	*No correlation*[166]	*No correlation*	Sample too small	42.9% (at 95%)	Sample too small
Sub2Mgr	*No correlation*	*No correlation*	Sample too small	53.5% at (95%)	Sample too small
	Latvia:				
	Latvia	*L1*	*L2*	*L3*	*L4*
N	*50*	*4*	*15*	*11*	*20*
Mgr2Sub	37.3% (at 99%)	Sample too small	*No correlation*	75% (at 99%)	*No correlation*
Sub2Mgr	43.1% (at 99%)	Sample too small	*No correlation*	58% (at 95%)	47% (at 95%)
		RESEARCH QUESTİON 2			
	All Cases:				
	US & Latvia				
N	*21*				
Mgr2Sub	*No Correlation*				
Sub2Mgr	56.7% (at 99%)				
	United States:				
	US	*US1*	*US2*	*US3a*	*US3b*
N	*5*	*1*	*0*	*4*	*0*
Mgr2Sub	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small
Sub2Mgr	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small
	Latvia:				
	Latvia	*L1*	*L2*	*L3*	*L4*
N	*16*	*1*	*11*	*1*	*3*
Mgr2Sub	*No Correlation*	Sample too small	*No Correlation*	Sample too small	Sample too small
Sub2Mgr	63.4% (at 99%)	Sample too small	67.1% (at 95%)	Sample too small	Sample too small

[165] 25.5% (at 99%) means that the strength of the correlation is 25.5% at the 99% significance level.

[166] *No correlation* means that the researcher has found no statistically significant correlation.

Chapter 5.
Conclusions and Recommendations

Development of Theory

My work has been developmental work in progress, and it is only in the last few years that there has begun to emerge anything like a total system to be implemented, by myself and some few consultant colleagues.[167]
Elliott Jaques

This dissertation is a continuous research endeavor of the general theory of managerial hierarchy, developed by Dr. Elliott Jaques. In 2002, Jaques identified the managerial system, its parts, and relations among these parts in his theory of managerial hierarchy.[168] His key observation was that "When managers and immediate subordinates are in roles in adjacent layers, things can work well; if within same layer, the manager is "breathing down the necks" of the subordinates; if more than one layer apart, the manager is "pulled down in the weeds."[169]

This research is the first study to test this specific Jaques' discovery in several managerial-type organizations in the United States and abroad (Latvia). The first research question attempts to find a relationship between the roles of manager and immediate subordinate towards their manager-subordinate relationship, whether it is *too close* ("breathing down the necks"), *too far* ("pulled down into the weeds") or *just right*. The second research

[167] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.
[168] Ibid.
[169] Ibid.

question, exploratory in nature, calibrates the first question on the account of Jaques' other finding, of current potential capability, and attempts to identify the relationship in cases where not only the manager works one stratum higher than the subordinate, but also where each worker's capability matches his or her working stratum. Altogether, the researcher identified 99 cases for the study, 49 in the United States and 50 in Latvia. To obtain one valid case for a subordinate, the researcher has had to survey at least the subordinate him/herself, immediate manager and manager-once-removed to follow Jaques' protocol for identifying the stratum of the role, the current potential capability of the subordinate and other pertinent information. Some companies had only a few employees and/or not enough managerial levels to attain statistical reliability at the company level. In these cases, the researcher could still use them in the aggregate analysis of all cases (as well as for each country). The researcher considers ten or more cases as sufficient for the analysis. Additionally, the researcher uses the 95% statistical confidence level or better to state results from analyzing data.

Interpreting Results

Research Question 1

The data shows approximately a 25% correlation between the predictive aspect of Jaques' general theory of managerial hierarchy, which describes how managers and subordinates would feel towards each other based on the sizes (strata) of the roles of manager and subordinate. This means that the research found approximately a 25% correlation between the measured Jaques' manager-subordinate relationship types [170] and the following theoretical predictions: when managers and immediate subordinates work in roles one stratum apart, they feel *just right* towards each other; if within same layer, they feel *too close*; if more than one layer apart, they feel *too far*.[171]

In the United States, there were two companies which had more than ten cases: companies US1 and US3. Analyzing data for company US1 shows no statistically significant correlation, while conducting the same analysis for company US3 demonstrates a statistically significant correlation between the roles and the manager-subordinate relationship-types: just right, too far and too close.

[170] Jaques' manager-subordinate relationship (MSR) types are just right, too far or too close.
[171] Ibid.

The Latvian data shows similar results: there is no statistically significant relationship in Latvian company L2, while Latvian companies L3 and L4 have statistically significant relationships. Latvian company L3 has a 75% correlation between the roles and the manager's MSR, and 58% correlation for the subordinate's MSR. Latvian company L4, on the other hand, has no statistically significant relationship for the manager's MSR, but 47% correlation for the subordinate's MSR. The only fundamental similarity between US company US1 and Latvian companies L1 and L2 is that these companies are family-owned and operated. In fact, in each company, both husband and wife are actively involved in managing the business as presidents, CEOs, and the like.[172]

US companies US2 and US3 and Latvian companies L3 and L4 are not family-owned and operated. US company US3 and Latvian company L4 are global multi-national corporations, while Latvian L3 is a franchise of a global multi-national corporation.

The following table summarizes the results for research question 1:

Table 5.1. *Summary of Results, Research Question 1*

	RESEARCH QUESTION 1				
	TOTALS:[173]	Companies:[174]			
			All Cases:		
	US & Latvia				
N	*99*				
Mgr2Sub	25.5% (at 99%)[175]				
Sub2Mgr	24.7% (at 99%)				
			United States:		
	US	*US1*	*US2*	*US3a*	*US3b*
N	*49*	*25*	*6*	*15*	*3*
Mgr2Sub	*No correlation*[176]	*No correlation*	Sample too small	42.9% (at 95%)	Sample too small
Sub2Mgr	*No correlation*	*No correlation*	Sample too small	53.5% at (95%)	Sample too small
			Latvia:		
	Latvia	*L1*	*L2*	*L3*	*L4*
N	*50*	*4*	*15*	*11*	*20*
Mgr2Sub	37.3% (at 99%)	Sample too small	*No correlation*	75% (at 99%)	*No correlation*
Sub2Mgr	43.1% (at 99%)	Sample too small	*No correlation*	58% (at 95%)	47% (at 95%)

These results are inconclusive (as indicated by "*No correlation*") regarding whether family-owned and operated

[172] The George Washington University's Professor Emeritus Jerry B. Harvey, Ph.D., when discussing with the author the data and results, suggested that the author has made a significant discovery differentiating family-owned and operated companies from the Jaques' classical managerial organization.

[173] TOTAL represents the aggregate (total) number of cases summed together as N specifies (99 total cases, 49 for US, and 50 for Latvia).

[174] US1 means that results belong to US Company 1, L1 that results belong to Latvian Company 1, etc.

[175] 25.5% (at 99%) means that the strength of the correlation is 25.5% at the 99% significance level.

[176] *No correlation* means that the researcher has found no statistically significant correlation.

organizations support Jaques' premises, but they show clearly that non-family owned managerial organizations do support Jaques' premises.

Research Question 2

Answering the study's exploratory research question 2, the study finds a 56.7% correlation between the roles and subordinate' MSR. The study, on the other hand, finds no statistically significant correlation between the roles and the manager's MSR.

The following table summarizes the results for research question 2:

Table 5.2. *Summary of Results for Research Question 2*

RESEARCH QUESTION 2					
	TOTALS:		Companies:		
	All Cases:				
	US & Latvia				
N	*21*				
Mgr2Sub	*No Correlation*				
Sub2Mgr	56.7% (at 99%)				
	United States:				
	US	*US1*	*US2*	*US3a*	*US3b*
N	*5*	*1*	*0*	*4*	*0*
Mgr2Sub	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small
Sub2Mgr	Sample too small	Sample too small	Sample too small	Sample too small	Sample too small
	Latvia:				
	Latvia	*L1*	*L2*	*L3*	*L4*
N	*16*	*1*	*11*	*1*	*3*
Mgr2Sub	*No Correlation*	Sample too small	*No Correlation*	Sample too small	Sample too small
Sub2Mgr	63.4% (at 99%)	Sample too small	67.1% (at 95%)	Sample too small	Sample too small

In US companies studied people are found to be more capable than their roles. The researcher, therefore, cannot find pairs of managers and subordinates whose capabilities match the size of their roles to conduct a meaningful analysis. In Latvia, three of the four companies do not have many employees in roles matching employees' current potential capabilities. In the fourth company, family-owned and operated company L2, the relationship between the difference of roles of manager and subordinate, and the subordinate's MSR is significant with correlation strength of 67.1%.

Interpreting Results

The data shows that Jaques' observations hold in managerial organizations, particularly in non-family owned and operated businesses. Describing a managerial organization, Jaques writes:[177]

[177] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

> Management organizations are not systems of individual people working together in amorphous groups or teams, whose relationships are dominated by personality differences and problems of group dynamics. Management organizations are systems of specified roles in which people are employed, and of role relationships which call for specified requisite behaviors between role incumbents, behaviors which need to be established and contractually required, regardless of the personality makeup and values of the individual. (p. 4)

The correlations' strengths varied from as low as 0% in family-owned and operated companies to as high as 75% for manager's MSR in non-family businesses. For subordinate's MSR, in family-owned and operated corporations, these strengths were in the range of 0% to 67% (when roles matched with capabilities). In non-family managerial organization, the strengths varies between 43% to 58%.

Interpreting these results, the research shows that Jaques' manager-subordinate relationship has a relatively significant relationship with stratification of roles of manager and subordinate in non-family-owned and operated managerial organizations, and possibly even in family-owned and operated companies when people's roles are matched with their capabilities. These results tend to support Jaques' theory.

Furthermore, the data suggests that family-owned and operated companies are not classical managerial organizations Jaques describes.

Jaques writes:[178]

> … managerial systems …are a post-tribal successor to extended family work in tribal societies (p. 19, 20).

The research shows that present family-owned and operated companies belong to a different class of organization, a hybrid between "family work in tribal societies"[179] and the modern corporation, at least where husband and wife actively manage day-to-day operations of the business. These family-type businesses have properties of associations, or member-based organizations which Jaques described in his General Theory of Bureaucracy book[180] (1976), whose members are usually family relatives, and of managerial organizations, consisting of hired employees for lower-level roles managed by the family members. These types of

[178] Ibid.
[179] Ibid.
[180] Jaques, Elliott (1976). A General Theory of Bureaucracy. London, UK: Heinemann Educational Books.

organizations appear not to abide by the principles Jaques identified for managerial organizations as they are rather a hybrid of member-based family relatives in top management roles and contractual employees in subordinate roles.

The author believes that these types of organizations require a different classification and further research, and possibly a different name separating them from managerial organizations; the author calls these family-type organizations family-owned and operated managerial organizations.

Even though the data appears not to support the MSR principle of Jaques' theory in the family-owned and operated organizations, when calibrated for people's capabilities, the data demonstrates that the MSR principle may still hold (for the subordinate's MSR, at a relatively high strength of 67% in one family-owned and operated company). This finding may suggest that if the family-owned and operated business is organized based on Jaques' theoretical principles, it may still achieve a requisite organization with predictable optimum manager-subordinate relationships structures, and as close as it can get to a requisite[181] managerial organization structure-wise.

Having classified the family-type managerial organizations into their own class, the author sees appropriate to classify the other managerial organizations into managerial organizations and requisite managerial organizations (MO and RMO [182]). The following table summarizes the results of the data based on these new classifications:

[181] Requisite organization would mean that the company is designed using Jaques' principles.

[182] The researcher realizes that even a requisite managerial organization may need to be classified into different sub-classes based on the amount of Jaques' principles implemented and in use. Despite that, the researcher still thinks that any requisite managerial organization, in theory, should reveal higher correlations. The author hopes to achieve and test these propositions in his future work.

Table 5.3. *Correlations for Family and Managerial Organizations*

	Family	Managerial Org[183]	RMO[184]
RESEARCH QUESTİON 1			
N	*44*	*55*	
Mgr2Sub	*No correlation*[185]	35.6% (at 99%)[186]	Unknown[187]
Sub2Mgr	*No correlation*	36.7% (at 99%)	Unknown
RESEARCH QUESTİON 2			
N	*13*	*8*[188]	
Mgr2Sub	*No correlation*	*No correlation*	Unknown
Sub2Mgr	56.1% (at 95%)	73.4% (at 95%)	Unknown

The data, thus, demonstrates that Jaques' relationships hold in managerial organizations with a correlation strengths at around 35%. When aligning for capabilities, the data shows that many people have greater capabilities than the roles they are in, and in general, are mismatched to their roles based on their current potential capabilities (CPC). Therefore, the researcher has not identified many subordinate-manager pairs where their roles matched their current potential capabilities. Nonetheless, the data tends to show that when aligning for capabilities, both family-based and managerial organizations tend to hold Jaques' relationship for the subordinate, but not for manager.

Identifying these statistically significant relationships, the researcher believes there is a need to collect data in several requisite managerial organizations and to compare the results; the researcher hopes to achieve this in his future endeavors and encourages others to follow.[189]

[183] The author assumes that the companies studied are not requisite because they were not designed or established based on Jaques' principles.

[184] These types of organizations are hard to come by as many of them do not reveal that they are requisite for competitive advantage reasons; also, some requisite organization consultants "hide" their clients and prohibit research at all costs (this was the experience of the author trying to extend this study to include for a Toronto-based requisite managerial organization – even though the company seemed interested, the consultant blocked the author's research). The author sees researching requisite managerial organizations as the next step in his near-future research endeavors.

[185] *No correlation* means that the researcher has found no statistically significant correlation.

[186] 35.6 % (at 99%) means that the strength of the correlation is 35.6% at the 99% significance level.

[187] The researcher purposefully left the RMO column blank to identify the need for future research in requisite managerial organizations.

[188] Even though the sample size is smaller than 10, the researcher still thinks it is an important finding because many people are mismatched to their roles to obtain a large-enough sample.

[189] Identifying and particularly finding RMOs, the researcher found out, is not a simple endeavor because most RMOs do not disclose themselves for competitive advantage reasons. The investigator did find one RMO, but the organization's consultant sabotaged the researcher's efforts to conduct this study in the company, even though, superficially, "everyone" is interested in Jaques' research.

Theoretical Implications

Jaques writes (2002) that his thoughts and theories are always in development.[190] The data analysis for this research endeavor shows that family-owned and operated businesses and managerial organizations are different in nature, and thus, require a different theoretical framework. Jaques' general theory of managerial hierarchy depicts the relationships and identifies parts of a managerial organization, but apparently excludes family-owned and operated managerial organizations, which are rather a hybrid of top management of family owners and contractual employees in lower-level roles. This study has not explored the parts and pieces of family-based organizations, but the data shows that Jaques' general theory of managerial hierarchy should develop a new chapter characterizing, identifying and elaborating on these types of organizations, and possibly comparing them with managerial and requisite managerial organizations in long-term studies for effectiveness, productivity, growth and other business and industry criteria.

Family-based organizations have significant family-dynamics between husbands, wives, daughters, and sons, who end up managing employees, that are not present in managerial or requisite managerial organizations, and that possibly affects the nature of the relationship between managers and subordinates. The researcher hypothesizes that this happens because of unclear authorities and accountabilities. All managerial organizations suffer from unclear roles, and unspecified authorities and accountabilities; but the family-owned and operated companies, the researcher believes, suffer the most because the owners can have a complete authority over everything. Even in managerial organizations, no manager has an absolute authority, and always is a contractual employee of the organization. The family members are not contractual employees of the company, without a possibility of being "let go" for incompetence, mismanagement, and other actions. The family members can act as they please within the corporate entity, with or without the best intention for the business endeavor. As one owner of a family-owned and operated company put, "I care more about this woman than anything in this world, and I don't really care if she runs the enterprise to the ground."[191] Thus, the researcher thinks that family-owned and operated companies fundamentally differ from non-

[190] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.
[191] Ivanov, Sergey (2005). Personal Interview.

family-based corporations, and Jaques' theory should account for them differently.

Another classification is necessary to differentiate managerial organizations from Jaques' requisite managerial organizations. Jaques' requisite organization would have all of the roles, authorities and accountabilities clearly specified, while most managerial organizations do not specify the roles, authorities and accountabilities explicitly. The researcher thinks that unclear roles, mismatched capabilities, unspecified authorities and accountabilities are the shortcomings of organizational systems Jaques believes are a threat to the well-being of people. He writes about managerial organizations and the importance of studying them,[192]

> During the last century these systems have come to absorb and to affect 70% to 90% of all those who work for a living in our economically advanced nations. The shortcomings in these systems have become a threat to the well being of the employees and their families and the nations in which they work – in the USA some 250 million people (p. 2).

The research demonstrates that the relationships that Jaques empirically found have statistical significance in terms that the relationship between the manager and the subordinate may correlate strongly to the (Jaques'-defined) strata of their roles. Whether the strength of this relationship would increase or decrease in a requisite organization is unknown, and the researcher thinks it is crucial for a future development of the theory and understanding of the management-work phenomenon to prevent and avoid the shortcoming of these systems for the benefit of everyone employed as well as the society at large.

Furthermore, Jaques argues that even the best-managed companies are under-performers; Jaques writes,[193]

> …although modern capitalist democracy has proven to be economically very successful, it is realizing only 50-60% of what could be realized, if its managerial systems were requisitely organized. And the potential gains in social good could not only be spectacular, but are urgently necessary, if we are going to sustain a healthy free enterprise democratic society (p. 16).

Therefore, these types of research, the author believes, are necessary. The data shows that the relationships Jaques talks about hold, but that the theory should separate the managerial, requisite

[192] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.
[193] Ibid.

managerial, and family-based managerial organizations. In his theory, Jaques says (2002) that there need to be established psychologically requisite relationships between and among the parts of a managerial organization, "including accountabilities and authorities" (p. 5).[194] The author thinks that this latter part, accountabilities and authorities, is distorted in family-owned and operated organizations because of family dynamics.

Practical Implications

The researcher believes that it is crucial to test and study all of the theoretical foundations for organization of work before offering advice to businesses because even a well-intended advice, based on untested theory, has a potential to harm.[195]

This research has verified some of Jaques' theoretical foundations and found them valid. Even in the family-owned and operated corporations, when roles are aligned with employees' current potential capabilities, the MSR principle tends to hold. Thus, in general, this research validates some of the theoretical foundations for Jaques' general theory of managerial hierarchy, and makes his propositions and advice to companies plausible and more ethical. When Jaques suggests that manager's and subordinate's roles should be one stratum apart for the most effective relationship, this advice may be beneficial for the organization and people employed.

Employees don't feel right when the manager "breathes down their necks" or is too far to provide direction; Jaques considers such manager-subordinate relationships ineffective. Employees tend to feel more effective when the manager is just the right distance away to provide meaningful direction, but without "micro-managing;" Jaques calls this type of the relationship the optimum manager-subordinate relationship.[196] This research shows than there is a statistically significant correlation between how the subordinate and manager feel based on their roles, and thus, practically, Jaques' theory and this research advice for companies

[194] Ibid.

[195] This special topic the author developed based on conversations and personal discussions with Dr. Elliott Jaques.

[196] The author and Jaques had a discussion on what constituted an effective manager-subordinate relationship. Jaques asked whether an effective relationship can develop (1) when the manager breathes down the subordinate's neck (too close), or (2) is so far removed that feedback and direction is not provided to the subordinate, and the he or she feels lost while the manager feels that the subordinate pulls the manager down into the weeds (too far). Jaques thought that when manager and subordinate feel just right distance-wise towards each other, that this is the optimum and most effective manager-subordinate relationship implemented and enforced by the organization's system. (Jaques, Elliott (2000-2003). Personal Communication.)

to separate managers' and subordinates' by one stratum (and possibly also match employees' current potential capabilities with the sizes of their roles) is substantiated.

Future Research

Science- or theory-based classification of entities is necessary in order to study and draw conclusions of their behavior. Based on this research, the author thinks it is necessary for future studies to differentiate managerial-type organizations into family-owned and operated, managerial and Jaques' requisite managerial organizations. The author thinks it would be important to study all three types: family-owned and operated, managerial and requisite managerial companies longitudinally to see which one is more effective. Should this type of research prove fruitful, requisite organizations should be classified and studied further, possibly developing an industry classification program based on Jaques' research.

Conclusion

This research has been a complex and long effort lasting almost six years, starting in 2000 and going until 2006. It demonstrates that some of the relationships that Jaques described in managerial organizations hold and have statistical significance. Furthermore, the study discovered that family-owned and operated companies are different from typical managerial organizations, and require further research. The researcher found that US-based companies and Latvian-based companies are not different based on the tested manager-subordinate relationship and stratification of work, but family-owned and operated companies differ from non-family-based managerial organizations. The research supports Jaques' general theory of managerial hierarchy in non-family-owned and operated organizations, and even in family-owned and operated organizations for subordinates when roles are aligned with employees' current potential capabilities.

Overall, the research's data demonstrates that even in the family-based companies (when aligned for capability) and managerial organizations, Jaques' manager-subordinate relationship-types correlate significantly, as Jaques has predicted. Jaques has not specified how strong or weak these relationships may be; the researcher hypothesizes that family-owned and operated organizations distort manager-subordinate relationships. Managerial organizations distort them also, because of unclear authorities, roles, accountabilities and other unspecified dynamics,

but the distortion is less than in the family-based companies. The author expects to find stronger relationships in the requisite managerial organizations, the themes to be tested and explored in future studies.

Appendix 1.

Measuring in Social Sciences

Despite a general understanding of measurements and measuring, it is integral to re-visit the measurements theory and understand measuring in the social sciences. It is crucial to understand and elaborate what a measure is, what types of measures there are, and what the differences among different types of measures exist to ensure reliable, accurate and meaningful depiction of reality measured. Sarle (1995) argues that proper use of various measuring and statistical techniques and methods is necessary for a "responsible real-world data analysis."[197] He distinguishes between measures and actual attributes measured – the idea is that the measures should accurately depict a real-world phenomenon. The example the author provides is measuring lengths of sticks with a ruler – if one stick is 10 cm, and the other is 20 cm, then the second stick must be twice longer than the first – thus, we have drawn an accurate conclusion about the sticks' lengths. Sarle defines measurement as "assigning numbers or other symbols to the things in such a way that relationships of the numbers or symbols reflect relationships of the attribute being measured."

There are various types of measurements that are known – the types vary by their degree of accurate reflection of the real world phenomenon. These types are: nominal, ordinal, interval log-interval, and ratio numbers.

Nominal measures are less useful – they are just an enumeration and have nothing more than symbolic values. Ordinal type is also not very useful[198] – the ordinal measures show whether one property is less or more than the other, and depict the following relationship, that if things X and Y with attributes a(X) and a(Y) are assigned numbers n(X)and n(Y), in such a way that $n(X) > n(Y)$, then $a(X) > a(Y)$.[199] Interval measures become more useful than ordinal, though even interval measures may still be inadequate for a precise scientific research – the main property of the interval-level variables is that the differences between numbers reflect similar differences between the attributes. Log-interval measures are such that the ratios between numbers reflect ratios between attributes.

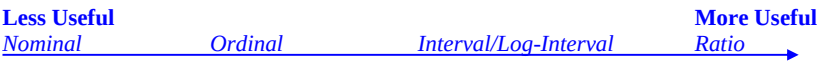
Ratio measures are most interesting and in-demand in every scientific field. Ratio scale numbers depict accurately the differences and ratios between the attributes and have a concept of zero, such as zero means nothing. For example, a stick, which length is zero centimeters equals to the length of zero meters, and is nothing – it doesn't exist! This is important to note because in interval-level numbers, zero does not mean that the property does not exist.

[197] Sarle, Warren S. (1995). Measurement theory: Frequently asked questions. Disseminations of the International Statistical Applications Institute, 4, 61-66.

[198] It is the author's opinion that ordinal scale measures are not very useful as they are imprecise depicting a real-world relationship.

[199] Sarle, Warren S., Ibid.

The following diagram demonstrates the usefulness (or preciseness) of measures' types:



At the present time, it has become acceptable in social sciences to manipulate and calculate numbers to analyze information using ordinal-level numbers, and various statistical techniques have been developed to make the analysis depicting reality as close and accurate as possible. Main reasons for using the ordinal-level measures have been the lack of measuring instruments to observe ratio-type data, until the recent past. Jaques believed to have found a scientific way to collect ratio-scale data using time-span of discretion instrument to measure the roles of managers and subordinates in managerial hierarchies, and thus, he only used the word measure when using ratio-scale data, and the word evaluate for all the others.[200]

[200] Jaques, Elliott (2003). Personal Communication.

Appendix 2.

Measuring Role with the Time-span of Discretion Instrument

The instrument to obtain ratio-scale data within organizational science is called time-span of discretion, which measures the level of work in a role by identifying the longest task or project within the role assigned by the manager to a subordinate, for which the subordinate has discretion and authority to complete the assignment. Dr. Elliott Jaques defines time-span as the "targeted completion time of the longest task or sequence in the role,"[201] and claims it is quite easy to measure. To measure a role, a researcher has to interview the manager and learn what the actual longest assignment s/he assigned to the subordinate is. For this research Dr. Jaques recommended to interview the subordinate and when feasible the manager-once-removed to confirm.[202]

Having measured over one hundred and seventy organizational roles, the author learned it takes about five minutes to interview the manager, and three minutes the subordinate – please see "Time-Span Handbook"[203] by Elliott Jaques for an exact guide how to go about using the time-span instrument, and its comprehensive description and examples of various types of roles, such as accounting, machinist, technologist, and many others.

Time-span is a ratio-scale measure of time of intention, with the absolute concept of zero. If the role's time-span is zero, that means that the role does not exist. If role A is measured at 6 months, and role B is measured at 1 year, then t(A) = ½ t(B) (t stands for time-span) – this means that role B is twice bigger than role A. Thus, all roles within a bureaucracy can be measured with time-span, and thus, analyzed. A project manager's role in company A, country X measured at 3 years is accurately comparable to the database designer's role in company B of country Y should time-span of this role be found to be 3 years as well.

In another example of divergent roles, it may take a day to prepare a small proposal – thus, the targeted completion time of this task is one day, and should this be the longest task in the role, it is a one-day role. In another role it may take seven years for the following task: expand into the Eastern market, build and create an Eastern-European home for the corporate products, and possibly merge and acquire emerging and competing companies with comparable products and potential – thus, the targeted completion time of this task is seven years, and should this be the longest task in the role, we will have measured the role at a seven years time-span. The following figure depicts the measurement through the target completion time:

[201] Jaques, Elliott. "A Theory of Life: An Essay on the Nature of Living Organisms, Their Intentional Goal-Directed Behavior, and Their Communication and Social Collaboration." 2000.
[202] Jaques, Elliott (2001). Personal Communication.
[203] Jaques, Elliott (1964). Time-Span Handbook. Rockville, MD: Cason Hall.

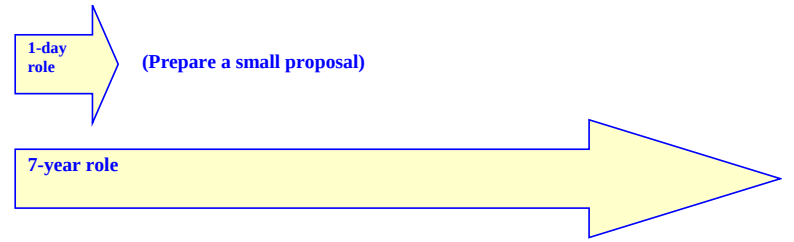


Figure X. *Different Stratum Roles.*

Appendix 3.

Evaluating a Person's Capability

Dr. Jaques evaluates a person's potential capability via the instrument called time-horizon, which is defined as a "method of quantifying an individual's potential capability, in terms of the longest time-span s/he could handle."[204] It is important to differentiate between measuring and evaluating. Measuring occurs when results are ratio-scale, for example, achieved via a time-span of discretion instrument to measure a role within a managerial organization. Evaluation occurs when it is not possible to achieve ratio-scale results, and instead, the results are of ordinal or interval scale. Even though there is no instrument discovered to obtain a ratio-scale measure of an individual's potential yet, it is still possible to determine the person's capability maturation stratum.

Dr. Jaques' book on human capability describes two methods to evaluate an individual's capability.[205] The first method covers all humans (and other species), and is quite complex.[206] This method requires involving a person in an intense argument to interpret the patterns of the person's structure and content of the argument to determine in which stratum this person's capability is.

The second method is considered easier, but just as effective. It was designed to be used internally in managerial organizations, and it works as follows. Having determined the stratum of roles of managers and subordinates using the time-span of discretion instrument, the interviewer asks the managers and subordinates additional questions whether a person has the capability to work at the next managerial level at the present time assuming that this person has all the necessary skills, knowledge and experience.[207]

If the subordinate, manager and manager-once-removed agree that the subordinate has the capability to work at the next managerial level, then the subordinate's current potential capability is indeed in that next 'agreed-upon' stratum, which has been determined when roles have been measured. Dr. Jaques writes (1994), "If … you had agreement between an employee, that employee's immediate manager, and that employee's manager-once-removed, that the employee had the current potential to work at a particular level – say Stratum II – that would be about as good an evaluation of that person's current potential as you can get" (p. 44).[208]

Dr. Jaques felt that people innately 'know' the capability of their subordinates and themselves, but lack the language to express their thoughts accurately. Dr. Jaques validated (1994) the accuracy of both

[204] Jaques, Elliott. "A Theory of Life: An Essay on the Nature of Living Organisms, Their Intentional Goal-Directed Behavior, and Their Communication and Social Collaboration." 2000.
[205] Jaques, Elliot & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.
[206] Jaques, Elliott (2002). The Life and Behavior of Living Organisms: a General Theory. Westport, CT: Praeger Publishers.
[207] Jaques, Elliott (2001, 2002, 2003). Personal Communication.
[208] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.

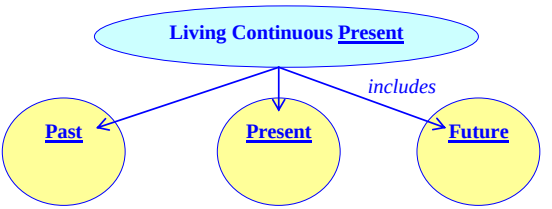
methods against each other[209] and summarizes (2002), "Kathryn Cason and I discovered a 0.97 correlation between judged potential in individuals to work at a given stratum, and the most complex method they could use in processing information."[210]

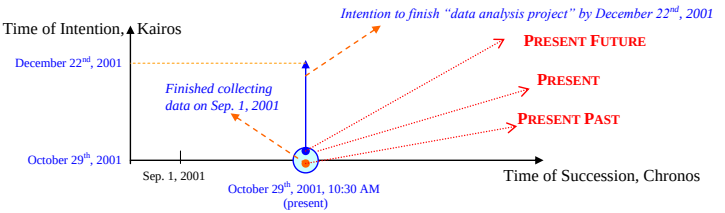
The author's study uses the second method developed and validated by Dr. Jaques because the method was developed to be used specifically in managerial organizations, to investigating which this study is strictly limited.

[209] Jaques, Elliott & Cason, Kathryn (1994). Human Capability. Rockville, MD: Cason Hall.
[210] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

Appendix 4.
Jaques' Propositions of Two Dimensions of Time

To elaborate the idea of two dimensions of time, it is necessary to analyze the idea of past, present and future. Dr. Jaques writes in "The Form of Time"[211] that St. Augustine recognized this phenomenon[212] – both concluding that there exist present past, present present, and present future; both, the past and future are with us today – they do not exist separately from the present. The following charts elaborate and explain the time phenomenon further:





Let's assume that today is October 29th, 2001, 10:30 AM. Today, on October 29th, 2001 I know I finished collecting data for a project – I keep a record of this event, finishing collecting data. At the same time, today, I am intending to analyze the data collected by December 22nd, 2001 – this is the intended future event that can be measured with a ratio scale measure – 55 days – this is the future that is with us in the present; when December 22nd comes, I will record whether I am done with the task or whether I re-schedule it, and eventually would record an actual finishing date on the axis of succession. The time of succession may feel more real (because as a generation, we have become used to it), but the time of intention will determine the behavior in completing the task. Let's assume that I indeed finished the intended project on December 22nd. The following time chart would help explain the events:

[211] Ibid.
[212] Saint Augustine (1961). Confessions. New York, NY: Penguin Books.

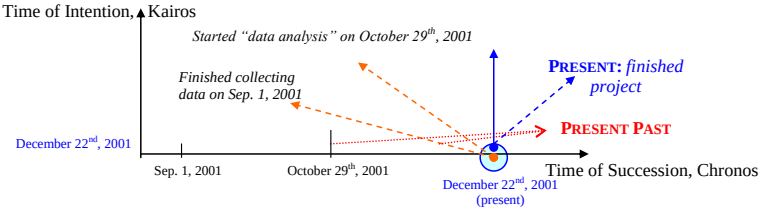


Chart 2. Dimensions of Time.

Today, on December 22nd, 2001, I have the records of the events on September 1st and October 29th, 2001, and I finished the 55-day assignment as I intended on October 29th (to finish by December 22nd) – all these events exist now, in the present past. Additionally, including the time of intention, we can measure goals with precise ratio-scale data – by when. This is one of the premises of Dr. Jaques' book "The Life and Behavior of Living Organisms: a General Theory" that the difference between inanimate physical objects and living organisms is intentions: living organisms intend to achieve a goal by a certain deadline, while inanimate objects have no intentions, and thus, exist in a four-dimensional world, rather that five-dimensional of the living biological creatures.[213]

To achieve certain desired results by a definitive deadline requires the living organism to deal with the complexity of information to make decisions, such as which choice to make of the many options available. The living organism receives the information in dynamic states, movements, and directions from the external and internal environments. Each living organism processes this dynamic data based upon its own internal capability to deal with information complexity. The capability of the living organism is defined by its ability to plan goals into the longest time in the future, such as planning to get food within an hour, to buy a house within a year, and so on. These time horizons vary greatly with the evolutionary development of the particular species.[214]

[213] Jaques, Elliott (2002). The Life and Behavior of Living Organisms: a General Theory. Westport, CT: Praeger Publishers.

[214] The evolutionary development of species has been addressed and discussed in Jaques' A theory of life, published in 2002 under the name, The life and behavior of living organisms because the publisher refused to print the book with its original title.

Appendix 5.
Glossary

All definitions used in this research have been defined in Dr. Elliott Jaques' works, especially the last two publications:
Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.
Jaques, Elliott (2002). Social Power and the CEO. Westport, CT: Quorum Books.

The following terms are defined as follows:

GTMH:

Jaques' General Theory of Managerial Hierarchy, formerly known as Stratified Systems Theory or Requaite Organization Theory.

MSR:

Manager-Subordinate Relationship, can be of three types: too close, too far, and just about right. Jaques' hypothesis is that manager and subordinate feel just right when the manager's role is one stratum above the subordinate's role in the managerial organization.

Role:

A position in a social system.

Size of role in terms of its time-span:

The size of any employment role is defined by the longest time span to completion of the assignments in that role.

Time Span of Discretion (T/S):

Time Span of discretion is the targeted completion time of the longest task or sequence in a role. Time-span measures the level of work (complexity) in a role.

Size of the person in terms of time-horizon (T/H):

The longest time-span a person could handle at a given point in that person's maturation process.

Capability:

The ability of a person to do work.

Applicable Capability (AC):

The capability someone has to do a certain type of work in a specific role at a given level at the present time. It is a function of his/her complexity of information processing measured in time-horizon (TH), how much s/he values the work of the role (V/C), his/her skilled use of knowledge for the tasks in the role (K/S), and ability to carry out required behavior (RB). We can think of this as AC = *f*TH * V/C * K/S * RB.

Current Potential Capability (CPC):

A person's highest potential capability in the sense of the maximum level at which someone could work at the present time, given the opportunity to do so and provided that the work is of value to him/her, and given the opportunity to acquire the necessary skilled knowledge. It is an expression of the person's maximum complexity of information

processing, and is measured in terms of a person's time-horizon (TH). This level of work is the level that people aspire to have and feel satisfied if they get it. When people have work at their current TH, they feel the have an opportunity for the full expression of their capability.
Decision: The making of a choice with the commitments of resources.

Level of Work (LoW) in a Role:

The weight of responsibility felt in roles as a result of the complexity of the work in the role. The level of work in any role can be measured by the time-span of discretion of role.

Managerial layering (strata):

Universal pattern of time-span determined layers

The following exerts are additional quotes from Dr. Jaques' writings[215] that are important to include into the glossary as clarifications and additions to the terms used.

The size of the maximum current working capability of any employee can is defined as the longest time-span he/she could carry if he or she had the necessary skilled knowledge, commitment and experience for the work (p. 6).

The following are the quotes from one of the last Dr. Elliott Jaques' papers: Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology:

Time-horizon can be readily and reliably evaluated by the individual, his/her manager, and his/her manager-once-removed, by what I have called a gearing process. It measures complexity of individual information processing and maximum problem solving capability—what IQ has sought to measure, but never did (p. 6)

This innate capability can be shown to mature predictably throughout the whole of life, in contradiction to the general assumption that maturation ends around 18 years of age and learning takes over. The empirically determined maturation bands are shown in chart 1. It has been the lack of this measure that has led to the proliferation of "competencies", which become unnecessary once innate capability is known (p. 6).

My theoretical proposition stems from two key discoveries that were made through the use of the two measures. The first was that there is one, and only one system of requisite layers for all managerial hierarchies, with boundaries between layers identifiable by time-span measurement. When managers and immediate subordinates are in roles in adjacent layers, things can work well; if within same layer, the manager is "breathing down the necks" of the subordinates; if more than one layer apart, the manager is "pulled down in the weeds" (p. 7)

[215] Jaques, Elliott (2002). The Psychological Foundations of Managerial Systems: A General Systems Approach to Consulting Psychology. San Antonio, Texas: Midwinter Conference of the Society of Consulting Psychology.

Appendix 6.

Orders of Information Complexity

Jaques (2002), in his unpublished paper Orders of Complexity of Information and the Worlds We Construct,[216] has identified the differences between the orders of information complexity and how the living organisms handle complexity. His paper preludes to a major discovery of a basic unit of information, which Dr. Jaques shared with the author in April 2002. The basic unit of information is a "tangible," something that can be pointed to, that objectively exists. For example, the statement "pick up this stick" contains two basic units of information (BUI).[217]

pick up[218] → 1 BUI
this stick → 1 BUI

The statement "pick up this stick"[219] is communicated to the reader via the written language, this essay, which would be communicated among the species of the first order of complexity of information via signaling.[220] Thus, humans physically manipulate various tangibles via different orders to which they have matured. The greater the capability of a member (the higher the order he or she has matured), the greater he or she manipulates the tangibles. Each order contains increasing levels of information complexity. The first order consists of identifiable tangibles, items to which one can point. The second order consists of intangibles, which are a collection of tangibles (e.g., trash); the third consists of related systems of intangibles; the fourth, of continuously changing intangibles; and the fifth, of related systems of continuously changing intangibles.[221] As noted earlier, very few humans mature to Order 5.[222] The greater the individual's capability, the greater potential he or she has to influence and change society.

[216] Jaques, Elliott (2002). Orders of complexity of information and the worlds we construct. Gloucester, MA: Unpublished manuscript.
[217] Dr. Jaques discovered the basic unit of information in April 2002 and shared this discovery with the author in Washington, DC.
[218] The basic unit of information includes tangible verbs and nouns, both of which have been elaborated in the information systems field, in information and behavior modeling.
[219] The author has chosen this statement because Dr. Jaques taught his latest discovery by throwing his walking stick on the floor and asking the author to pick it up and count the number of BUIs.
[220] Jaques, Elliott (2002). The life and behavior of living organisms: a general theory. Westport, CT: Praeger Publishers.
[221] Even though the BUI is discovered and can objectively be pointed to, the sudden death of Dr. Elliott Jaques has stopped research into the nature of information complexity and finding the instrument to measure the complexity with ratio scale values.
[222] See data collected by Jaques, available from the Requisite Organization International Institute, for precise percentages of population maturation.

Appendix 7.
Dr. Elliott Jaques' Personal Note to the Author

The note below is Dr. Elliott Jaques's confirmation of the author's successful completion and passing of Dr. Elliott Jaques' course. This class entailed learning a general theory of managerial hierarchy, as well as other theories developed by Dr. Jaques, and conduction of a pilot-research study to learn the practical application of all the theories. It took the researcher approximately a year-and-a-half to complete this course[223] and the results are described in chapter 3 section 3 (the class started in the summer of 2001 and completed in the fall of 2002). This course serves as a proof that the entire research endeavor specified in this study is feasible, and results would be useful not just to theory's applicability, but also possibly advancing the theory and provide an innovative practical advice to managerial organizations.

[223] Jaques, Elliott (2001). Management 398 Graduate Course. Washington, DC: The George Washington University.

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To Whom It May Concern

This will certify that Sergey Ivanov has successfully completed the class MOT 398 and has earned a Grade A.

Elliott Jaques
Research Professor
Management Science

Appendix 8.

Author's Publications and Conference Presentations

Published Papers

In order to validate the research's idea, the author attempted to submit portions of the research to refereed publications, and have succeeded. The purpose for publishing this research-in-progress was to ensure that other leading theorists and researchers concur and critique the study so that to ensure a wider study's critique.

The first paper published in 2001[224], in Transactions in International Information Systems, dealt with the theoretical foundations for the study, and possible implications on global public policy. The second refereed paper[225], which was evaluated as the best paper submitted, was accepted for a publication in Kluwer Academic Press. This paper talks about applying a general theory of managerial hierarchy theory to design IT teams, develop software, and bring forth innovations in associations and bureaucracies. Other papers include the following publications:

Ivanov, Sergey (2004). Scientific critiques of a general theory of managerial hierarchy and its application to the modern society and organizations. Systems Thinking in Management Refereed Conference Proceedings, University of Pennsylvania, Philadelphia, PA.

Ivanov, Sergey (2003). The RO Theory, Discovery of BUI, and IS: Beginning of Theoretical Foundations. Kluwer Academic/Plenum Publishers.

Ivanov, Sergey (2003). Investigating the Optimum Manager-Subordinate Relationship in Global Managerial Systems: A Case Study and Report of Key Findings for Practical Use in Global IT Management and Organizations: A Trend for the Future. 14th IRMA International Refereed Conference Proceedings.

Ivanov, Sergey (2003). Designing Effective IT Teams and Organizations: Preliminary Results of Research-in-Progress. SAIS 2003 Refereed Conference Proceedings.

The author submitted the above papers so that other leading theorists and researchers could critique the author's ideas and provide useful feedback. Having published seven articles in a variety of refereed forums, the author has found no arguments against the research endeavor, and has found most scholars supporting the study.

Conference Presentations

In addition to refereed publications, the researcher attempted to present portions of the research on several national and international conferences to a wide range of researchers to have the study critiqued by

[224] Ivanov, Sergey (2001). Future Public and Private Policies Related to Pay, Strategy and Globalization: A Theory Based Approach. Transactions in International Information Systems; ISSN 1507-8647.

[225] Ivanov, Sergey (2002). Recommendations for the Practical Use of Elliott Jaques' Organizational and Social Theories in the Information Technology Field: Teams, Software, Databases, Telecommunications and Innovations. Kluwer Academic/Plenum Publishers.

a wider audience of world scholars. The International Information Systems Development conference, was in Riga, Latvia in September 2002, and attended by researchers from all over the world: Australia, United States, Finland, Latvia, Lithuania, Estonia, England, France, Hungary and other countries. The presentation went well, and instead of thirty minutes, the audience spent a over 2.5 hours to discuss the ideas of the paper, with good and positive comments. Other conferences included presentations in Washington, DC (2005),[226] Toronto, Canada (2005),[227] Ashburn, VA (2004),[228] Melbourne, Australia (2003),[229] Savannah, Georgia (2003),[230] Philadelphia, Pennsylvania (2003),[231] and Philadelphia, Pennsylvania (2004)[232].

[226] Ivanov, Sergey (2005). 21st Annual Washington Consortium of Business Schools, Faculty Research Forum, University of the District of Columbia, Washington, DC.
[227] Ivanov, Sergey (2005). Global Organization Design 2005 Conference: Achieving Potential through Liberating Structures, Toronto, Ontario, Canada.
[228] Ivanov, Sergey (2004). 5th Research Conference on Human and Organizational Studies (CHAOS 2004), The George Washington University, Ashburn, VA.
[229] Ivanov, Sergey (2003). Information Systems Development (International Conference), Monash University, Melbourne, Australia.
[230] Ivanov, Sergey (2003). Sixth Annual Conference of the Southern Association for Information Systems (SAIS), Savannah, Georgia.
[231] Ivanov, Sergey (2003). 14th IRMA International Conference, Association (IRMA), Philadelphia, Pennsylvania.
[232] Ivanov, Sergey (2004). 3rd International Conference on Systems Thinking in Management (ICSTM 2004), University of Pennsylvania, Philadelphia, PA.

Appendix 9.
Form Used to Collect Research Data

THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON DC

(Manager) Name: ___ Position: ___ Grade: ___

People directly reporting to you:

You report directly to: ___ ← ___ **Manager once Removed, MoR**

Question about your potential capability: provided you have the skills, knowledge and experience:

1. Can you work at your manager's (M) level? MM? MMM? MMMM? ___
2. How do you feel about the level of work in your role? (Overwhelmed, bored, right, underemployed, happy) ___

   How come? ___

   Single-task role (S) or multiple-task role (M)?
   S → how long for marginally substandard work for manager to find out?
   M → What longest assignment? How long would you give me to complete this assignment? Phases?
   Too far, just about right, too close? How do you feel towards your manager/subordinate?

Subordinate (S):

Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span: ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span ___ | ___ is ___	M	MM	MMM
Sub Name: ___	Role: S / M	Time-span. ___ | ___ is ___	M	MM	MMM

Subordinate Once Removed (SoR)

SoR Name: ___	M	MM	MMM	MMMM	5M	Manager's Name: ___
SoR Name: ___	M	MM	MMM	MMMM	5M	Manager's Name: ___
SoR Name: ___	M	MM	MMM	MMMM	5M	Manager's Name: ___
SoR Name: ___	M	MM	MMM	MMMM	5M	Manager's Name: ___
SoR Name: ___	M	MM	MMM	MMMM	5M	Manager's Name: ___
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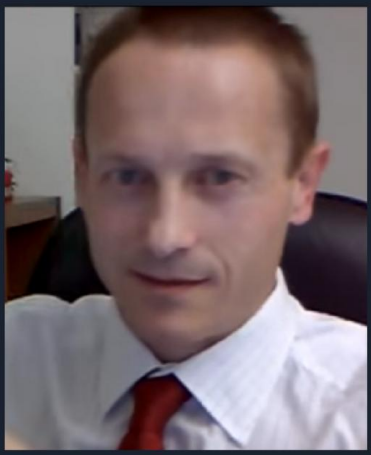

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