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A TYPOLOGY OF REASONING BASED ON ELLIOTT JAQUES' QUINTAVE MODEL OF COGNITIVE FUNCTIONING APPLIED TO MORAL PROBLEM SOLVING

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A TYPOLOGY OF REASONING BASED ON ELLIOTT JAQUES' QUINTAVE MODEL OF COGNITIVE FUNCTIONING: AN APPLICATION TO MORAL PROBLEM SOLVING

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ACKNOWLEDGMENTS

Natural childbirth is an amazing experience.

This baby was born with the help of others.

Elliott Jacques is the father and, hopefully, the child's birth will make my dear friend proud.

Stuart Umpleby and Jeff Lenn were tireless members of my committee. Looking closely I'm sure they see many of their features in the child's face-- thanks.

Jerry Harvey was my advocate, my antagonist, and my midwife. From the first twinkle in my eye, through the screams of pain and the bloody clean-up he has been there-- attention riveted on the health of the baby. My anger about his apparent lack of concern for my well-being because of his undaunted concern for the fetus, at times blinded me to the fact that he was doing his job. He did it well, and I love him for it.

My gratitude also goes to the many others who sent flowers and attended showers; to the host of faithful and the few helpful. Among these, an extra pat on the back goes to Nancy Cunningham and my wonderful mother, June. A special "thank you" goes to my loving wife, Carolyn, who held my hand during it all and loves the baby as if it were her own.

Natural childbirth <u>really</u> is an amazing thing.

CHAPTER ONE

INTRODUCTION

Individuals within organizations regularly make decisions which affect the well-being of others; these decisions, by definition, have moral implications.[1] When confronted with such situations, people frequently do not agree on what action is appropriate. Such disagreement, however, may not result because those involved have different moral values but may, instead, occur because they use different types of reasoning.

Understanding differences among various types of reasoning could help answer important questions about how people solve moral problems. Two specific questions are of interest:

- Does conflict result among groups or individuals because they use different types of reasoning to determine "the moral" course of action?

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[1]The definition of "morality" used in this dissertation is discussed in Chapter 2. The essential feature of the definition concerns action which affects the well-being of others.

- Do situational factors and/or personal factors affect the types of reasoning employed by an individual when responding to moral problems?

Before one can explore how the structure of reasoning affects moral problem solving, a reliable classification scheme must be available. Therefore, this research limits its objectives to developing and testing such a classification scheme and does not apply the resulting research method to the exploration of the two questions posed above.

An analogy may help a reader understand the method being developed and tested. The classification method is designed to function like a color chart--a device which helps people to identify different colors. What is critical for determining the value of a color chart is whether it can be used to consistently identify the color of some other object. For example, before drawing conclusions about what a person's favorite color is or why a person prefers one color over another, one must be able to reliably identify the colors themselves by using a color chart.

Similarly, the research conducted in this dissertation tests the reliability of a new typology for classifying distinct types of reasoning employed by individuals when responding to problems with moral dimensions. The typology

is not designed to classify the individuals themselves or to assess the level of their moral development. Rather, it is used only to classify the specific types of reasoning a person employs when responding to questions concerning problems which require making moral choices.

If researchers are to avoid making generalizations about groups or individuals, a method for classifying the type of reasoning reflected in individual responses is essential. In fact, future research may find that conflict results because two parties use different types of reasoning to solve one problem; yet, when a different problem arises, both may use the same type of reasoning and avoid conflict. Further, a response-oriented classification scheme provides researchers the means for exploring the possibility that individuals use different types of reasoning in different situations. Once developed, a response-oriented typology can be applied in future research to explore important questions about moral problem solving.

The cognitive-structural approach for classifying reasoning provides a basis for developing such a typology. Proponents of this approach contend that reasoning can be classified according to the underlying structural patterns inherent in cognitive processes. Although the approach can be applied to classifying the reasoning used in any type of problem solving, this dissertation focuses specifically on moral problems because of my interest in moral problem solving.

Numerous theorists, including Jean Piaget[2] and Lawrence Kohlberg[3], have applied the cognitive-structural approach to define stages of moral development. In their models, a specific type of moral reasoning characterizes each stage in a hierarchy of moral development. Using this approach for developmental models, they integrate the structure of reasoning with the content of moral values. Although both Piaget and Kohlberg assert that their developmental models are based on cognitive-structural criteria, critics argue that neither model adequately distinguishes between the structure and the content of moral reasoning.

This dissertation does not attempt to resolve the debate concerning developmental models which separate the structure and the content of moral reasoning. In fact, except for using the cognitive structural approach, my work does not directly build on Kohlberg's work. Instead, the current research develops a cognitive-structural classification scheme based upon a structurally defined model of cognitive functioning. Elliott Jaques' Stratified Systems Theory (SST) provides such a model.[4]

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[2]Jean Piaget, The Moral Judgment of the Child, trans. Marjorie Gabain (New York: The Free Press, 1965).

[3]Lawrence Kohlberg, Essays on Moral Development, vol.2: The Psychology of Moral Development (San Francisco: Harper & Row, 1984).

[4]Elliott Jaques,"Development of Intellectual Capability," in Essays on the Intellect, ed. Frances R.

SST describes the ways in which stratified cognitive functioning affects organizations. As part of SST, Jaques has proposed a model which includes four distinct modes of thinking--each representing a structural change in level of cognitive abstraction. He defines the four modes in terms of an individual's ability to construct distinct kinds of conceptual categories, or "sets."[5]

Jaques asserts that these four cognitive modes occur in patterns called "quintaves." Like the octave of the musical scale where C is the first and last note, the first mode of a quintave reappears as the last. Jaques calls this structure the Quintave Model of Cognitive Functioning.[6] Even though Jaques' use of the word "quintave" to describe a pattern of only four modes of cognitive functioning can be confusing, I will use his terminology. Jaques' structurally defined Quintave Model provides the theoretical groundwork for a new typology which can be used to classify the type of reasoning used when responding to moral problems.

The purpose of this research, then, is twofold. First, I will develop a typology, called a Quintave Typology of Reasoning, based on Jaques' Quintave Model of Cognitive Functioning; second, I will test both the Quintave

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Link (Alexandria, VA: Association for Supervision and Curriculum Development, 1985). pp. 163-184.

[5]Ibid.

[6]Elliott Jaques, "Cognitive Complexity" (manuscript in personal file of Flynn Bucy, January 1987), p.4.

Typology's validity as a reflection of Jaques' theoretical constructs and its reliability as a tool for classifying the types of reasoning used when responding to moral problems.

The remainder of this dissertation consists of five chapters. Chapter Two reviews literature relevant to developing such a typology. Chapter Three proposes the typology and discusses its use as a research tool. Chapter Four simply states the two hypotheses to be tested. The fifth chapter describes the methodology for gathering and analyzing the data used to test the hypotheses.

A final chapter discusses the results and implications of the research. Specifically, Chapter Six first presents theoretical and methodological contributions made during the development of the Quintave Typology. It then discusses how the typology could be applied in future research to explore the two questions asked at the beginning of this chapter. A final section explores implications of this research for the concept of moral development.

CHAPTER TWO

LITERATURE REVIEW

The theoretical basis for the proposed research comes from two bodies of literature. The first, from the field of Moral Psychology, uses a cognitive-structural approach for classifying moral reasoning; the second, from the study of human systems, is Jaques' work which deals with stratified cognitive functioning.

The first section of this chapter outlines a general framework for discussing moral reasoning. Section two defines the cognitive-structural approach and reviews several of its specific applications. The final section summarizes that part of Stratified Systems Theory which postulates stratified cognitive functioning.

A Framework of Moral Reasoning

The intent of this section is not to review the vast body of literature included in the study of morality, but instead to select from that literature only the concepts necessary to provide a framework for discussing moral reasoning. Part one of this section identifies two major

fields in the study of morality: Moral Philosophy and Moral Psychology. It also establishes the specific focus of this research on the structure, not the content, of moral reasoning. The second part discusses moral problem solving as a component of moral reasoning and describes its underlying structure. The final part of this section identifies three approaches for classifying moral reasoning.

Two Major Fields in the Study of Morality

The literature concerning morality can be divided into two major fields--Moral Philosophy and Moral Psychology. Moral Philosophy is primarily concerned with the study of values and the role they play in the moral codes which define acceptable behavior. Throughout history, numerous moral codes have been developed by different groups to reflect that group's particular values.[7]

A second field within the study of morality, Moral Psychology, explores the mental processes involved in both producing moral behavior and evaluating the moral acceptability of that behavior. In contrast to Moral Philosophy's focus on value content, the focus of Moral Psychology is on the reasoning process of moral judgment. Both mental processes and moral values are, in practice, always integrated when an individual exercises moral judgment, but distinguishing between these two dimensions

[7]Peter F. Drucker, "What is 'Business Ethics'?" The Public Interest (Spring 1981), p.22.

can add insight into their interaction. Therefore, since the current research focuses on the cognitive structures underlying moral reasoning rather than the value content constituting morality, the majority of the literature relevent to this research comes from Moral Psychology.

James Rest has proposed a useful paradigm for exploring the literature on Moral Psychology. He divides the field into three areas: behavior, affect, and cognition.[8] According to Rest, behaviorists study behavior, psychoanalysts study affect, and cognitive psychologists study cognition. The cognitive psychologists typically use the term "moral reasoning" to refer to the reasoning processes involved when an individual engages in moral problem solving.

Moral Problem Solving

What distinguishes a moral problem from a nonmoral problem? The response to this question depends on the definition of morality one uses. William Frankena defines "morality" as "a normative system of judgments concerning the effects of action on the well-being of persons."[9] Based

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[8]James R. Rest, ' "The Major Components of Morality," in Morality, Moral Behavior and Moral Development, William M. Kurtines and Jacob L. Gewirtz (New York: John Wiley & Sons, 1984). p.24.

[9]William K. Frankena, Thinking About Morality (Ann Arbor: University of Michigan Press, 1980), p. 25.

on his definition, a problem can be defined as a moral problem when someone faces a situation in which his or her decision will affect someone's well-being.

This definition of a moral problem raises two important questions. First, what situation does not include some consequence of one person's action on others' well-being? Some philosophers have argued that all situations have moral implications.[10] Others contend that in order to consider a situation a moral problem the effect on someone's well-being must be direct and material.[11] Many moral philosophers, however, adopt the point of view that all situations fall on a continuum with situations having direct and material consequences on one end and situations having indirect and insignificant consequences on the other.[12] Situations on the former end are clearly moral problems; for example, someone's decision to murder an innocent person. Similarly, situations on the latter end are clearly not moral problems. For example, a decision to scratch your head with your left hand instead of your right hand does not affect another's well-being.

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[10]Bernard Williams, Morality: An Introduction To Ethics (New York: Harper & Row, 1972), pp. 80-87.

[11]Ibid.

[12]G. J. Warnock, The Object of Morality, (London: Methuen & Co LTD, 1971), pp. 12-26.

An on-going debate involves finding the exact place on the continuum where situations cease being moral problems.[13] No definitive answer to this question exists. The dilemma points, in turn, to a second question about defining a situation as a moral problem.

Who must or can make the determination of whether a situation contains a decision with possible consequences direct and material enough to be considered a moral problem? Certainly the person making a decision does not necessarily need to recognize the moral dimensions for a situation to be considered a moral problem. Otherwise, anyone could be exempted from moral responsibilities by simply refusing to consider the possible consequences of his or her actions on another's well-being. Rather, each person analyzing a situation is responsible for considering the moral implications and deciding whether or not the situation should be called a moral problem.

Again, at either end of the continuum a high degree of agreement will exist among individuals over whether a situation is legitimately considered a moral problem. In the middle of the continuum, considerable disagreement could occur. In the methodology of this dissertation, the hypothetical scenarios presented are called moral problems because they fall on the first end of the continuum--they clearly involve actions which affect people's well-being.

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[13]Ibid., p. 14.

The moral content of a problem distinguishes moral problem solving as a subset of the larger class of general problem solving. Consequently, the underlying problem-solving structure is the same for both moral problems and for nonmoral problems. Clif Williams provides an example of a generic problem-solving process model.[14] He describes the problem solving process as consisting of the following four components: (1) definition of the situation; (2) development of alternative solutions; (3) evaluation of alternatives; and (4) implementation of the best alternative.

Numerous authors interested in analyzing the thought processes involved with moral problem solving have described the moral reasoning process by combining specific moral dimensions with a generic problem-solving structure. James Rest, for example, proposes that the process of moral reasoning involves four components: (1) interpreting a situation in terms of how one's actions affect the welfare of others; (2) deciding what one ought to do--applying moral ideals to the situation to determine the moral course of action; (3) choosing among moral and non-moral values to decide what one actually intends to do; and (4) implementing one's decision.[15]

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[14]Henry L. Sisk and J. Clifton Williams, Management and Organization, (Cincinnati: South-Western Publishing Co., 1981), pp. 117-23.

[15]Rest, Components of Morality, p. 24.

James Fishkin proposes a description of the moral reasoning process which incorporates only the first two components of Rest's description and one of his own. He identifies three components of moral problem solving: (1) interpretation of the situation; (2) construction of alternative courses of action; and (3) judgment of the appropriate course of action.[16]

Richard Niehbur suggests that before asking what should be done to respond to a moral problem, one should ask, "What is going on?"[17] His description of moral reasoning emphasizes the process of interpreting a situation in order to develop a course of action which best fits the circumstances.

Helen Weinreich-Haste contends that perception of the causal factors should be included in a description of the moral reasoning process.[18] She emphasizes that one must consider the historical antecedents to a particular moral problem before adequate moral judgments are made.

The above referenced authors add moral content to a generic problem-solving process to help understand moral

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[16]James S. Fishkin, Beyond Subjective Morality: Ethical Reasoning and Political Philosophy (New Haven, NH: Yale University Press, 1984), p. 10.

[17]H. Richard Niebuhr, The Responsible Self (New York: Harper & Row, 1963), p. 56.

[18]Helen Weinreich-Haste, "The Social Context of Moral Reasoning," in Morality, Moral Behavior and Moral Development, ed. William M. Kurtines and Jacob L. Gewirtz (New York: John Wiley & Sons, 1984), p.327.

reasoning. In contrast, this dissertation utilizes a generic problem-solving process to clearly distinguish between the content of moral problems and the structure of underlying cognitive functioning.

The problem-solving process used in this research includes the following four components: (1) interpretation of the situation; (2) perception of causation; (3) construction of alternative courses of action; and (4) determination and justification of the appropriate course of action. As the reader will note, the structure of this problem-solving process has some of characteristics of the structures used by Rust, Fishkin, Weinreich-Haste, and Niebuhr.

The first component, interpretation of the situation, is consistently identified as a starting point in generic problem-solving models. Rest, Fishkin, and Niebuhr also define this component as the first in their process descriptions. Rest, particularly, emphasizes the moral dimension of a situation in an effort to distinguish between moral problem solving and non-moral problem solving. However, the basic structure remains common, independent of the content of the problem being addressed.

The second component, perception of causation, makes explicit the factors considered responsible for a situation. Some problem-solving models exclude this component because it can be considered a part of the interpretation of a

situation. The current process definition includes it as a separate component because, as Weinreich-Haste's argues, perception of who or what caused a situation is particularly significant to the resolution of a moral problem.[19]

Construction of alternative courses of action is the third component of the process. Although the development of alternatives is a common component in most generic problem-solving models, models of moral problem solving rarely explicitly include it. Rest, for example, assumes that alternatives are considered for their moral implications, but does not recognize the decision maker's responsibility for constructing the alternatives considered.[20] Fishkin, on the other hand, does discuss subjective perception of alternatives as a part of moral reasoning.[21] The process definition used in this research includes construction of alternatives as a component because it highlights a subject's responsibility for creating his or her perceived options.

The final component, determination and justification of appropriate action, is essential for an adequate definition of the problem-solving process. At some point in the

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[19]Ibid., p. 329.

[20]Rest, Components of Morality, p. 26.

[21]Fishkin, Ethical Reasoning, p. 14.

process, the decision maker must use some rationale to choose from among the alternatives constructed.

The question which addresses this component is structured in terms of "appropriate" action instead of asking explicitly for the "moral" action because moral considerations are only one of many factors involved in selecting a course of action. Rest identifies two separate components in his definition of the moral reasoning process. The first component emphasizes the determination of moral action, and the second component considers the interaction of moral values within a broader field of values.[22] Since this dissertation is not concerned with identifying the broad range of values which influence moral problem solving, both of Rest's components are incorporated into one.

The process described above provides a framework for classifying the reasoning used in moral problem-solving. But, since problem-solving is only one dimension of moral reasoning, the following section identifies several approaches which have been used to classify types of moral reasoning.

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[22]Rest, Components of Morality, p. 27.

Approaches for Classifying Types of Moral Reasoning

Moral reasoning, the mental process of applying moral standards to specific situations, combines the concern of Moral Philosophy with value content and the concern of Moral Psychology with reasoning processes. Several schemes for classifying types of moral reasoning have been proposed by authors in both fields.

According to Niebuhr, moral philosophers have traditionally utilized two primary approaches in their study of moral reasoning.[23] The deontological approach asserts that individuals should base moral judgment on sound moral principles.[24] The teleological approach maintains that moral judgment should be based on the consequences of a moral decision.[25] While these two approaches are significant for understanding how values should be and are applied in moral judgment, they fail to illuminate the different psychological processes involved in responding to moral problems. These two approaches address the criteria used to evaluate the acceptability of moral action. That is fundamentally different from describing the type of reasoning used in responding to moral problems.

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[23]Niebuhr, The Responsible Self, p. 22.

[24]James R. Rest, Development in Judging Moral Issues (Minneapolis: University of Minnesota Press, 1979), p. 4.

[25]Ibid., p. 6.

Other approaches for classifying types of moral reasoning have been proposed within the field of Moral Psychology. Most of the work in this area, however, has focused on identifying a developmental hierarchy of moral reasoning. Different levels of moral reasoning are proposed as improvements in an individual's assimilation of moral standards into reasoning and action.[26]

Three basic theoretical approaches distinguish among levels of moral development: the cognitive-structural, the learning-behavioral, and the social-personality.[27] Each of these approaches hypothesize that the capacity for moral reasoning occurs in discrete stages, with each successive stage representing an advance in the adequacy of moral reasoning.

The cognitive-structural approach is of particular interest to this research because it provides the framework for the new typology to be developed.

The Cognitive-structural Approach for Typologies of Moral Reasoning

The cognitive-structural approach assumes that cognitive functioning occurs in qualitatively different

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[26]Ibid., p. 8.

[27]Ibid., p. 42.

modes, or patterns. These different cognitive modes, in turn, form the basis for classifying distinct types of moral reasoning.

Proponents of other schools of moral reasoning might argue that by separating the structure of reasoning from moral content, the cognitive-structural approach is no longer dealing with "moral reasoning." This research sharpens the distinction between moral reasoning, as traditionally defined, and the structure of reasoning used to respond to moral problems.

An example of a traditional school of moral reasoning is presented by Allen Gewirth in Reason and Morality. Gewirth defines moral reasoning as "an attempt to establish a rational basis for distinguishing between right and wrong, thus providing groundwork for a rational and normative system of ethics."[28] "Reasoning," according to Gerwirth, means a rational argument, or logic, which justifies a position.

The Place of Reason in Ethics, by Stephen Toulmin, provides an extensive analysis of how "reasoning" and "morality" interact.[29] Toulmin asks, "What is 'reasoning'?" He restates the question, "What reasons are

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[28]Alan Gewirth, Reason and Morality (Chicago: University of Chicago Press, 1978).

[29]Stephen E. Toulmin, The Place of Reason in Ethics (Cambridge: University Press, 1958).

being offered in support of a conclusion?"[30] His treatise on the subject identifies various "modes of reasoning." His modes of reasoning, however, refer to different rules of evidence, and distinguishes between scientific and moral arguments.

In the cognitive-structural approach, the term "reasoning" is not used to mean rationale or rules of evidence but refers instead to underlying cognitive processes. The key requirements for the integrity of the cognitive-structural approach are: 1) a strict adherence to a structural basis for classification and 2) a limitation of the implications derived from structural differences among types of moral reasoning.

However, the best known applications of this approach have failed to meet these requirements. Although both Jean Piaget and Lawrence Kohlberg have contributed significantly to acceptance of the cognitive-structural approach, their works have also created considerable misunderstanding about its value.

Piaget provided the foundation for this approach in his seminal work on cognitive development in which he proposed the concept of discontinuous cognitive functioning.[31] He later used this concept to propose the existance of discrete

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[30]Ibid., p. 67.

[31]Jean Piaget, Judgment and Reasoning in the Child, trans. Marjorie Warden (London: Routledge & Kegan Paul, 1951).

stages of moral reasoning. Kohlberg, building on the foundation established by Piaget, later became the dominant theorist utilizing the cognitive-structural framework.[32]

Numerous other theorists have conducted extensive research to critique and extend Piaget's and Kohlberg's theories of moral development. This dissertation, although applying the cognitive-structural approach, is not a direct extension of their work because of fundamental differences between their models and mine.

Their models describe hierarchical levels of moral development and are used to classify individuals as having reached a certain level of moral maturity. In contrast, the model developed in this research postulates the existence of distinct types of reasoning which can be described in purely structural terms and applied to classify the reasoning (not the individual) used to respond to moral problems.

Nevertheless, to provide important background, the following discussion briefly reviews the theories of both Piaget and Kohlberg. A final part of this section identifies other research which is based on the cognitive-structural approach and suggest how this dissertation might contribute to this research.

Piaget's Theory of Moral Judgment

Piaget's book, Judgment and Reasoning in the Child, published in 1932, is in contrast with other

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[32]Rest, Judging Moral Issues, p. 8.

of his contemporary's works on moral judgment.[33] Unlike researchers who were attempting to predict an individual's behavior by measuring his or her knowledge of specific rules or moral standards, Piaget theorized that moral judgment could best be understood by studying the underlying organization of the thinking used to respond to moral problems.

Piaget interviewed children about many kinds of moral situations, finding that they had definite intuitions about right and wrong; however, they seemed to use different "schema," or modes of reasoning.[34] Piaget hypothesized that different modes of cognitive functioning could be used to classify moral reasoning into hierarchical categories.

Piaget's model of moral reasoning has only two stages.[35] The first, heteronomous morality, describes "a point of view in which rules are seen as fixed in the nature of things," like natural, physical laws. The second, autonomous morality, describes "a point of view which sees rules as cooperative arrangements among equals, agreed upon for mutual benefit."[36]

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[33]Piaget, Moral Judgment, pp. 22-25.

[34]Ronald Duska and Mariellen Whelan, Moral Development: A Guide to Piaget and Kohlberg (New York: Paulist Press, 1975), p. 8.

[35]Ibid., p. 11.

[36]Ibid.

Piaget made at least two important contributions to the cognitive-structural approach. First, he defined moral reasoning in structural terms. Prior to his work, researchers did not consider the basic psychological structures underlying moral reasoning as a basis for classification.[37]

Second, Piaget introduced new methods for classifying types of moral reasoning. A significant characteristic of his methodology is the presentation of a hypothetical scenario to evoke a person's point of view. Although by today's standards Piaget's methods would be inadequate, many researchers have adapted his technique of the open-ended scenario.[38]

In addition to discounting his methods, critics have shown Piaget's two-stage model to be inadequate for distinguishing among types of moral judgment.[39]

His basic framework, though, has provided others with a point of reference for developing more adequate models. Lawrence Kohlberg's work represents the primary example of such efforts.

Kohlberg's Theory of Moral Development

Kohlberg's dissertation in 1958 began as an effort to

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[37]Rest, Judging Moral Issues, pp. 48-61.

[38]Ibid., p. 58

[39]Ibid., p. 59.

extend Piaget's work.[40] Kohlberg developed a new data-gathering procedure and classification system for exploring the moral reasoning not only of young children but also of adolescents. He has continued to expand on this early work, developing an extensive theory and methodology for describing moral development.

Review of Kohlberg's theory

Kohlberg, like Piaget, uses a cognitive-structural approach. But Kohlberg concluded that the two stages of moral development hypothesized by Piaget did not adequately describe the kinds of thinking demonstrated by his subjects. For Kohlberg, reasoning seemed to cluster into the following six stages:

Stage 1. Punishment and obedience;
Stage 2. Instrumental relativist;
Stage 3. Interpersonal concordance;
Stage 4. Authority maintenance;
Stage 5. Social contract;
Stage 6. Universal ethical-principle.[41]

Each stage is defined by "the shape, pattern, or organization of responses."[42] Kohlberg theorizes that each successive stage represents a qualitative

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[40]Lawrence Kohlberg, "The Development of Modes of Thinking and Choices in Years 10 to 16" (Ph.D. dissertation, University of Chicago, 1958).

[41]Kohlberg, Essays on Moral Development, p. 63.

[42]Ibid., p. 39.

improvement in reasoning which, in turn, leads to a higher level of moral judgment.

Although his theory and methods have undergone significant revision over the last twenty-five years, Kohlberg repeats his claim that the stages are universal, invariant, sequential, and structurally whole. He also continues to assert that an individual's stage of moral development can be classified based on cognitive-structural criteria, independent of specific moral content.[43] Kohlberg's critics challenge each of these claims.

Critique of Kohlberg's Theory and Methodology

Some of Kohlberg's critics claim that his theory is so incomplete and methodologically flawed that it should be rejected; others identify elements of the philosophical and methodological approach which need to be modified in order to resolve specific problems.[44] Since the purpose of reviewing Kohlberg's theory is to provide a point of departure for a new typology, this critique is limited to his definitions of "morality" and "development," his universalism, and his formal-structuralism.

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[43]Lawrence Kohlberg, Charles Levine, and Alexandra Hewer, Moral Stages: A Current Formulation and a Response to Critics, Contributions to Human Development Series, vol.10 (New York: Karger, 1983), pp. 69-95.

[44]Craig Dykstra, Vision and Character: A Christian Educator's Alternative to Piaget and Kohlberg (New York: Paulist Press, 1981), pp.7-28.

Definitions of "morality" and "development"

Kohlberg defines morality, not in terms of the effect of one's actions on others' well-being, but in terms of reasoning in conflict situations.[45] Careful study of Kohlberg's work reveals the centrality of the concept of justice to his definition of morality.

Craig Dykstra focuses his criticism on Kohlberg's definition of morality. What Kohlberg calls morality, according to Dykstra, is a theory of social reasoning--"the ability to adjudicate explicit claims in situations of social conflict."[46] Dykstra asserts that such a position limits morality to moral problem solving and assumes the moral self is primarily a problem-solving agent.

Kohlberg defines "moral development" as the "increasing adequacy of cognitive structures to differentiate, integrate, and adapt to the information and the experience of moral situations."[47] This definition does not take into account the values applied in moral judgments or the behavior resulting from those judgments. In this case, the reasoning process employed serves as the single criterion for assessing moral development. Some value-based cirterion must be involved for someone to judge the morality of a specific act or an individual in general.

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[45]Kohlberg, Levine and Hewer, Moral Stages, p. 69.

[46]Dykstra, Vision and Character, p. 14.

[47]Kohlberg, Levine and Hewer, Moral Stages, p. 75.

Roger Burton challenges the value of a theory of moral development which does not consider moral behavior.[48] He goes on to reject Kohlberg's operational definition of moral development by charging that "verbalized decisions about abstract moral dilemmas are insufficient for assessing moral development."[49]

Initially, Kohlberg described his theory as a "theory of moral development" and intended it to be a sufficient and comprehensive explanation of moral maturation. However, in a later statement, Kohlberg asserted that his model describes stages of moral judgment and does not imply that such judgment results in moral action.[50]

These concerns over Kohlberg's definitions are relevant to the current research because they emphasize the need to distinguish the structure of moral reasoning from the content of moral values. Making this distinction helps clarify each dimension of moral judgment and avoids the criticism Kohlberg has received.

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[48] Roger Burton, "A Paradox in Theories and Research in Moral Development," in Morality, Moral Behavior and Moral Development, ed. William M. Kurtines and Jacob L. Gewritz, (New York: John Wiley & Sons, 1984), p. 193.

[49] Ibid.

[50] Kohlberg, Essays on Moral Development, pp. 215-224.

Contention of universality

A second part of this critique focuses on Kohlberg's proposition that his model is universally applicable. Although he concedes that moral norms and behaviors vary from culture to culture, Kohlberg asserts that universal kinds of judging and valuing do exist and that his theory describes them.

Kohlberg's recently published research supports his universalist postulate.[51] On the other hand, studies by other scholars raise some significant methodological questions which Kohlberg has not addressed satisfactorily. Simpson argues that Kohlberg's contention of universality is not valid because Kohlberg has not studied a sufficient number of cultures to substantiate the claim.[52] Simpson also contends that the absence of stage five reasoning in some cultures, specifically Turkey and India, undermines Kohlberg's claims.[53]

Another formidable attack on the universality of Kohlberg's model comes from Carol Gilligan. She observes that Kohlberg's theory reflects a predominantly male-oriented view of morality based on the principle of

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[51]Ibid., pp. 582-620.

[52]E. L. Simpson, "Moral Development Research," Human Development 17 (1984): 81-106.

[53]Ibid., pp. 101-05.

justice.[54] Gilligan posits the significance of other moral principles, in addition to the principle of justice, such as those of care and response. Her thesis is that women are more oriented toward these principles than they are toward the principle of justice.[55]

The contention of universality has caused major problems for Kohlberg's theory because he failed to distinguish between the universal nature of cognitive functioning and the inherently "culturally relevant" nature of moral standards. This ambiguity again reflects the need to clearly distinguish type of reasoning from moral content.

Formal-structural account of moral judgment

The third aspect of this critique addresses Kohlberg's formal-structural account of moral judgment. Kohlberg's understanding of moral judgment is built on two significant assumptions. First, moral judgment, as defined by Kohlberg, has a Kantian formalist aspect which assumes moral judgments contain a categorical obligation to act and a universalizable point of view.[56]

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[54]Carol Gilligan, In a Different Voice: Psychological Theory and Women's Development (Cambridge: Harvard University Press, 1982).

[55]Ibid., p. 86.

[56]Kohlberg, Levine and Hewer, Moral Stages, p. 17.

A second assumption, that moral judgment can be defined in terms of cognitive structures without consideration of moral content, reflects a cognitive-structural bias. For Kohlberg, content represents an individual's specific moral beliefs while structure involves how a person reasons about the content.[57]

Moral philosophers, developmental psychologists, and, particularly, Christian ethicists have taken exception to Kohlberg's extreme formal-structuralism.[58] Sullivan argues that the formalist and structuralist basis of Kohlberg's perspective has produced a "morally blind" understanding of moral judgment.[59] Habermas challenges Kohlberg's claim that his methodology does not consider content and submits that justice is the moral content being assessed.[60]

The essence of the criticism over Kohlberg's stance of formal-structuralism centers around the inability of his theory and methods to distinguish between cognitive structure and moral content. This criticism can be avoided by using the cognitive-structural approach for defining different types of reasoning used to respond to moral

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[57]Ibid., p. 19.

[58]Ralph B. Potter, "Justice and Beyond in Moral Education," Andover Newton Quarterly 19 (January 1979): 145.

[59]E.V. Sullivan, "A Study of Kohlberg's Structural Theory of Moral Development: A Critique of Liberal Social Science Ideology," Human Development 20 (1977): 352-376.

[60]J. Habermas, "Moral Development and Ego Identity," trans. T. McCarthy (Boston: Beacon Press, 1979).

problems rather than classifying stages of moral development. This dissertation does not directly try to resolve the criticism Kohlberg has received because the purpose of the current research is not to address moral development.

In summary, legitimate questions exist concerning the adequacy of Kohlberg's model of moral development. But, Kohlberg is correct when he states that "none of the critics reject the idea of stages of moral reasoning or the fruitfulness of using a cognitive-structural approach to understand them."[61] His use of the cognitive-structural approach and his clinical methodology provide departure points for new lines of research.

New Directions for Research Based on the Cognitive-structural Approach

Many studies attempt to replicate or directly extend Piaget's and Kohlberg's work. Beginning in the early 1970s, however, new research applying the cognitive-structural approach appeared. James Rest identifies three such streams of research.[62]

The first arose from the need for a practical, reliable and valid method to assess moral development and for a data base to test the major claims of the cognitive-structural approach. Rest has developed the Defining

[61]Kohlberg, Levine and Hewer, Moral Stages, p. 2.

[62]Rest, Judging Moral Issues, p. 12.

Issues Test (DIT) in response to these needs. His method, however, moves away from open-ended scenarios and concentrates on defining moral terms.[63]

In the second stream of research based upon the cognitive-structural approach identified by Rest, researchers describe the governing principles by which children organize social knowledge. William Damon,[64] Robert Selman,[65] and Elliot Turiel[66] have done significant work in this area. Using a research method similar to Kohlberg's, they have addressed aspects of social development other than moral judgment, such as role taking and group dynamics.

A third stream of research using the cognitive-structural approach does not address developmental issues but explores how different situational factors affect

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[63]Ibid., p. 13.

[64]William Damon, The Social World of the Child (San Francisco: Jossey-Bass, 1977).

[65]Robert Selman, "The Relation of Role-Taking Ability to the Development of Moral Judgment in Children," Child Development 42 (1971): 79-91; "The Relation of Role-Taking Levels to Stage of Moral Judgment: A Theoretical Analysis of Empirical Studies" (Harvard University, 1973).

[66]Elliot Turiel, "The Effects of Cognitive Conflicts on Moral Judgement," Child Development 43 (1972) : pp. 741-756.

information processing and decision making. Brainard,[67] Gelman,[68] and especially Flavell[69] have focused on how the environment can affect the structural characteristics of moral reasoning.

Although the researchers in this group do not integrate their information-processing orientation with a developmental stage perspective, they do continue to adopt Piaget's proposition of discontinuous changes in cognitive functioning. Advancement of this research stream requires a model of cognitive functioning which provides criteria for classifying types of reasoning on purely structural terms.

In an insightful statement, Kohlberg expresses his dissatisfaction with Piaget's model when he said, "I'd be happy to stop patching up Piagetian assumptions if I could see another boat on the horizon which handled my problems and data better . . ."[70] A typology of reasoning cast in purely structural terms would help extend research into

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[67]C. John Brainerd, "Judgments and Explanations as Criteria for the Presence of Cognitive Structures," Psychological Bulletin 79 (1973): 172-79; "Response Criteria in Concept Development Research," Child Development 48 (1977): 360-66.

[68]Robert Gelman, "Logical Capacity of Very Young Children: Number of Invariance Rules, Child Development 43 (1972): 75-90.

[69]James Flavell, The Development Psychology of Jean Piaget (Princeton, NJ: Van Nostrand, 1963); "Stage-Related Properties of Cognitive Development," Cognitive Psychology 2 (1971): 421-53; Cognitive Development (Englewood Cliffs, NJ: Wiley, 1968).

[70]Kohlberg, Essays on Moral Development, p. 425.

moral problem solving. The current research provides such a typology. It is based on the part of Jaques' Stratified Systems Theory in which he postulates stratified cognitive functioning.

Jaques' Postulate of Stratified Cognitive Functioning

SST assumes the existence of (1) stratified cognitive functioning; (2) multi-track cognitive development; and (3) specific structural characteristics of requisite bureaucracies.[71] The only component of SST directly relevant to this research is Jaques' postulate of stratified cognitive functioning. This postulate has been primarily applied to the study of formal organizational systems. The research in this paper expands the applications of his postulate to the area of moral reasoning.

Jaques derives two hypotheses from his postulate of stratified cognitive functioning. In the first, he contends that as cognitive power increases, discontinuous changes in cognitive state occur and are ordered into strata which can be defined by time-frame ranges. In a second hypothesis Jaques asserts the existence of a hierarchy of four discrete modes of cognitive functioning which repeats at increasingly higher levels of complexity. These two hypotheses will be discussed separately in the following sections.

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[71] Jaques, "Development of Intellectual Capability," p. 120.

Stratification of Cognitive States

To elucidate the first hypothesis about the stratification of cognitive states, three concepts must be discussed: "cognitive power," "time-frame," and "discontinuous cognitive states."

Cognitive power

Jaques defines cognitive power as "the mental force a person can exercise in processing and organizing information and in constructing an operating reality."[72] Cognitive power is an individual's capability to create, manipulate, and interpret mental representations and incorporate them into a map of reality. Cognition, as used by Jaques, involves combining elements into meaningful patterns.[73]

Jaques makes a clear distinction between cognitive power and whatever is measured by IQ tests.[74] IQ scores are relevant to the learning of particular information but are not designed to measure the process by which information is gathered and organized. Cognitive power concerns the mental capacity to deal with complexity--not with the acquisition of particular knowledge.

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[72]Ibid., p. 107.

[73]Ibid., p. 111.

[74]Ibid.

An analogy for human cognitive power may be found in a computer's power. Computer power is a measure of a machine's capacity to process bits of information. The available power of a computer limits the size and complexity of the programs which it can process.

Just as a computer's power limits the programs it can run, Jaques contends an individual's cognitive power sets limits on the complexity of the patterns which he or she can manage. When cognitive power increases, so does the individual's capability to process larger and more complex patterns; the result is an increase in the size and complexity of his or her model of reality.

The amount of cognitive power possessed by an individual determines how far into the future his or her cognitive map of reality can be extended. According to Jaques, the future does not exist as an objective phenomenon; it is a mental formulation of expected patterns of change.[75] Therefore, the greater the cognitive power possessed by an individual, the further into the future his or her map of reality can be extended. Jaques describes this relationship between amount of cognitive power and potential time horizon with his concept of "time-frame."

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[75]Elliott Jaques, The Form of Time (New York: Crane, Russak & Company, 1982; London: Heinemann Educational Books, 1982), pp. 37-41.

Time-frame

Time-frame is defined as "the maximum temporal horizon achievable at any particular point in an individual's cognitive development."[76] Temporal horizon is "the distance into the future an individual can plan and execute specific goal-directed activities."[77] Jaques defines temporal domain as "the continuous psychological area bounded by a person's time horizon."[78]

The concept of time-frame involves the world of action, not the world of hypothetical scenarios. For example, a corporate planner may develop a twenty-year plan, but she does not deal with the twenty-year period as a continuous psychological domain unless she actually carries out the plan. Her actions, and thus her temporal domain, are bound by the time horizon within which she plans and carries out her development of the planning document. Similarly, one's hopes for the future may leap across decades, but the temporal domain incorporated into one's map of reality only extends as far as there is an illuminated and unbroken trajectory between "now" and "then."[79]

Jaques' notion that greater cognitive power results in the capability to construct larger and more complex models

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[76]Ibid., p. 135.

[77]Ibid.

[78]Ibid.

[79]Ibid., p. 136.

of reality may appear to be somewhat self-evident. Less evident is his proposition that cognitive functioning occurs in discontinuous states which can be defined in terms of time-frame ranges.

Discontinuous cognitive states

Central to Jaques' argument about stratified cognitive functioning is his assumption that "qualitative changes in the structure of a phenomenon can be caused by a change in quantity of one of its properties."[80] The structural changes in H_2O, from solid to liquid to gas, caused by increasing temperature provide an excellent example of discontinuous changes of state.

Jaques argues that even though the assumption of discontinuity of state is well understood and used by the natural sciences, social scientists rarely incorporate it into their theories.[81] Typically, the assumption in social science research has been that phenomena occur in a single continuum. The popularity of research methods employing the bell-shaped normal distribution curve, which is based on a single parameter and continuity of state, exemplifies the use of this assumption.

One striking exception to the assumption of continuity of state in social science research is the notion that

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[80]Elliott Jaques, R. O. Gibson, and D. J. Isaac, Levels of Abstraction in Logic and Human Action (London: Heinemann Educational Books, 1978), p. 3.

[81]Ibid., p. 4.

individual cognitive development occurs in stages, or discontinuous strata. While Piaget and others have discussed such changes in cognitive structure, Jaques makes a significant contribution to the subject by adding insight into when and how cognitive states change.

Jaques defines "cognitive state" as the structure of cognitive functioning.[82] A discontinuous change of cognitive state involves a qualitative shift in the organization of thought and an emergence of a new cognitive state manifested by a capacity for greater abstraction.

As previously discussed, Jaques postulates qualitative changes in the structure of cognitive functioning as cognitive power reaches specific critical points--points which are identifiable in terms of the maximum time horizon achievable. The discontinuities of cognitive state occur at the time horizons shown in Figure 1.

FIGURE 1
IDENTIFICATION OF COGNITIVE STRATA BY MAXIMUM TIME HORIZON

Cognitive Strata	/	Maximum Time Horizon
VII	/	50 years
VI	/	20 years
V	/	10 years
IV	/	5 years
III	/	2 years
II	/	1 year
I	/	3 months

[82]Interview with Elliott Jaques, Washington, D. C., 11 September 1986.

Stratum I is the cognitive state of individuals with enough cognitive power to achieve the projection of time horizons from one to three months. When an individual's cognitive power increases beyond that point, a qualitative shift in the structure of his or her cognitive functioning occurs and the person manifests the cognitive functioning consistent with Stratum II.

The thought patterns characteristic of the Stratum II cognitive state then operate until cognitive power increases to the point of another discontinuous change which occurs at the one-year time-horizon boundary. Stratum III is the cognitive state of individuals with sufficient cognitive power to achieve time horizons from one to two years; Stratum IV is the cognitive state of people with time horizons from two to five years, and so on.

In summary, Jaques uses time-frame ranges to define seven cognitive states which emerge as cognitive power increases. The qualitative differences among the stratified cognitive states result from the distinctly different structures of cognitive functioning which characterize each new stratum. These different structures of cognitive functioning are described in Jaques' quintave model.

Quintave Model of Cognitive Functioning

Jaques hypothesizes that a hierarchy of four discrete modes of cognitive functioning occurs in a quintave structure which repeats at increasingly higher levels of

complexity. The discussion of this hypothesis is presented in two sections: 1) a description of the four cognitive modes; and 2) a discussion of the relationship of the quintave's modes to the seven levels of cognitive strata.

Cognitive modes

Jaques identifies a hierarchy of four cognitive modes--shaping, reflecting, extrapolating, and parallel processing.[83] These four modes occur in patterns called "quintaves," with shaping as the first and last mode. Jaques compares the concept of a quintave to that of an octave of the musical scale. An octave is a 7-note scale with C as the first and last note of each octave. Like an octave, the quintave is typically read from the bottom to the top. Figure 2 displays the modes of the quintave model.

FIGURE 2
COGNITIVE MODES IN A QUINTAVE STRUCTURE

SHAPING
PARALLEL PROCESSING
EXTRAPOLATING
REFLECTING
SHAPING

Jaques distinguishes these cognitive modes one from another by the differences in their properties for

[83]Jaques, "Development of Intellectual Capability," p. 114.

constructing sets.[84] Although Jaques uses the concept of sets, he does not use formal mathematical Set Theory as the basis for his model. Instead, he refers to set construction as an individual's ability to combine what he calls "elements," or basic units, into conceptual categories called "sets." For example, the elements "chairs," "tables," and "couches," could be grouped together to construct the set, or category, "furniture." "Furniture" would then be considered a primary set.

Primary sets can be combined to form what Jaques calls "secondary sets." For instance, if the primary set "furniture" were combined with other primary sets such as "clothing," and "appliances," a secondary set, "household goods" would be formed.

Jaques uses the different ways of combining elements into sets as the basis for defining the four cognitive modes. His definitions for the cognitive modes of the quintave are:

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[84]Jaques, "Cognitive Complexity," p. 4.

I Shaping--involves using existing sets without constructing new sets;

II Reflecting--involves constructing unique, discrete, primary sets;

III Extrapolating--involves constructing interactive primary sets;

IV Parallel processing--involves constructing partial secondary sets;

V Shaping--involves constructing secondary sets.[85]

Shaping, as defined by Jaques, is mental processing which involves using previously constructed sets without building new sets. Additionally, a person employing this cognitive mode uses terms to label sets but does not identify the elements which constitute the sets. The components of the sets are implicit. For example, a person labeling the contents of a room as "furniture" does not explicitly identify the individual elements of the set.

Individuals using the second cognitive mode, reflecting, construct unique, discrete, primary sets of elements. Reflecting is in contrast to shaping which involves using only existing sets rather than newly formed sets.

A set is unique if it is constructed to deal with a specific situation. For example, even though a doctor has diagnosed cancer on many occasions, his diagnosis of a patient as having cancer is unique if it is constructed with specific observations of that particular patient's symptoms.

[85]Ibid., p. 4-8.

A set is described as discrete when it is not interacting with any other sets. In other words, the definition of the set is complete and the boundaries of the set are closed. And finally, a set is primary when it is made up of specific elements.

The extrapolating mode involves the construction of interactive primary sets. The key difference between this mode and the reflecting mode is that the sets which are constructed are dynamic and interact with each other instead of being static categories. Thus, extrapolating is the mental process of adding sets together, breaking them up, overlapping them or in some way allowing them to evolve over time. For example, the assignments and experiences of each discrete class session evolve to make up a college course. A decision tree diagram reflects the structure of extrapolating with future decisions evolving out of each previous decision.

Parallel processing involves the construction of partial secondary sets. A partial secondary set is a category which consists of both primary sets and elements. For example, parallel processing occurs when an individual considers the interaction of a discrete element (such as bidding on a contract) with existing secondary sets (such as on-going operations of marketing, production, and finance.)

At the bottom of the quintave, shaping involves the construction of secondary sets. Secondary sets are composed solely of primary sets; access to the uncombined direct

elements is lost. These secondary sets then become the direct elements for the shaping mode of the next quintave.

The five levels of abstraction just outlined make up the Quintave Model of Cognitive Functioning. As will be discussed below, Jaques goes on to posit that the quintave structure repeats at higher and higher levels of complexity.

Quintaves and cognitive strata

The hierarchy of cognitive modes is expressed in what Jaques terms "cognitive strata." In fact, the discontinuous changes in cognitive strata are hypothesized to occur because of changes in cognitive mode. The figure below describes the relationship between quintaves, cognitive modes, cognitive strata, and time-frames.

FIGURE 4
RELATIONSHIP BETWEEN QUINTAVES, COGNITIVE MODES, COGNITIVE STRATA, AND TIME-FRAMES

Quintave	Cognitive Stratum	Cognitive Mode	Time-frame
----		shaping	5000 yrs
		parallel processing	2000 yrs
QD		extrapolating	1000 yrs
		reflecting	500 yrs
----		shaping/shaping	200 yrs
		parallel processing	100 yrs
QC	VII	extrapolating	50 yrs
	VI	reflecting	20 yrs
----	V	shaping/shaping	10 yrs
	IV	parallel processing	5 yrs
QB	III	extrapolating	2 yrs
	II	reflecting	1 yrs
----	I	shaping/shaping	3 mos
		parallel proc	1 day
QA		extrapolating	10 hrs
		reflecting	5 hrs
----		shaping	1 hr

Quintave A (QA) includes the lowest levels of task complexity, typically the types of tasks addressed by children. The normal range of adult operation exists at the QB level. QC includes the more complex tasks required for leadership of large organizations. QD is Jaques' speculation about the existence of the level of complexity required to deal with the construction and maintenance of whole societies. He has not observed any individuals operating in QD. However, he hypothesizes it is possible that the QD exists and that certain individuals such as mystics and religious messiahs may actually operate with a time-frame extending hundreds or thousands of years into the future.[86]

In summary, Jaques proposes the existence of four different modes of cognitive functioning which occur in repeating quintave hierarchies. In the following chapter, these different cognitive modes provide the basis for defining types of reasoning used to respond to moral problems.

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[86]Jaques, "Development of Intellectual Capability," p.124.

CHAPTER THREE

QUINTAVE TYPOLOGY OF MORAL REASONING

This chapter presents a typology of moral reasoning based upon Jaques' Quintave Model of Cognitive Functioning. An assumption underlying the typology is that the structural form of an individual's response to a moral problem will reflect one of the four cognitive modes defined by the quintave model. While becoming acquainted with the typology, the reader should be aware that it is designed for use as a part of the methodology specified in this paper and is not designed for classifying reasoning which takes place outside the parameters of this methodology.

The typology operationally defines the structural form of responses hypothesized to reflect the four cognitive modes of Jaques' Quintave Model. Responses are elicited by asking four specific questions which address the four components of the problem-solving process defined in the previous chapter. These questions are: 1) In your own words, how would you describe the situation? 2) What caused this situation? 3) What are your alternative courses of action? 4) What would you do, and why?

The typology consists of four sections, one per question. Within the individual sections of the typology are four definitional statements, each of which defines the structural form of responses hypothesized to reflect one of the four modes of cognitive functioning. These definitional statements, in turn, provide the basis for classifying the type of reasoning exhibited by individuals in response to the four questions.

The typology can be mentally conceptualized as a four-by-four matrix with the four questions as rows and the four cognitive modes as columns. However, the typology is actually constructed with four sections, each containing four definitional statements; this formulation is more useful as a classification tool than a four-by-four matrix.

Section I--Situation

shaping
reflecting
extrapolating
parallel processing

Section II--Causation

shaping
reflecting
extrapolating
parallel processing

Section III--Alternatives

shaping
reflecting
extrapolating
parallel processing

Section IV--Selection and Justification

shaping
reflecting
extrapolating
parallel processing

Although the methodology is presented in detail in a subsequent chapter, a brief description is given here to help provide an understanding of the typology's design. The researcher presents a person with a written scenario containing a moral problem and asks the four questions which address the components of the problem-solving process. For example, after reading the scenario, a subject is asked, "In your own words, how would you describe the situation?" The researcher then classifies the response using as criteria the definitional statements in the first section of the typology. Understanding the typology as a part of the research methodology is essential for comprehending both its potential and limitations.

Figure 4 presents the Quintave Typology of Reasoning. The discussion following Figure 4 includes both an explanation and an example of each definitional statement in the typology.

FIGURE 4
THE QUINTAVE TYPOLOGY OF REASONING

SECTION I--Responses Describing a Situation

Cognitive Mode	Structural Form of Responses
Shaping:	a label without definition or specification.
Reflecting:	a label defined by one or more specific elements, or two or more specific elements defining an implied label.
Extrapolating:	a series of connected events evolving over time.
Parallel Processing:	a scenario with possible connections among multiple issues and/or events.

SECTION II--Responses Describing the Cause

Cognitive Mode	Structural Form of Responses
Shaping:	a single factor in a one-step process.
Reflecting:	a single factor defined by one or more specific elements in a one-step process, or two or more specific elements defining an implied single factor in a one-step process.
Extrapolating:	a series of related factors in a multi-step process.
Parallel Processing:	probable interaction among multiple processes.

SECTION III--Responses describing Alternative Actions

Cognitive Mode	Structural Form of Responses
Shaping:	a choice of either accepting or rejecting a given action.
Reflecting:	construction of two or more specific actions.
Extrapolating:	one sequence of action with two or more choice points, or two or more unconnected alternative sequences of action.
Parallel Processing:	two or more interactive sequences of action.

SECTION IV--Responses describing Selection and Justification

Cognitive Mode	Structural Form of Responses
Shaping:	a single action justified by a single reason.
Reflecting:	one or more specific actions, each justified with multiple reasons.
Extrapolating:	one or more sequences of action, each with two or more choice points, each choice point justified with serially connected consequences and/or principles.
Parallel Processing:	two or more interactive sequences of action, each choice point justified with multiple interactive consequences and/or principles.

The following discussion provides the theoretical rationale for the definitional statements within each section of the typology. These statements are operationally defined here because they provide an observable criterion for classifying responses.

Section I--Description of a Situation

The first section of the typology contains the definitional statements hypothesized to reflect the structure of each of the four cognitive modes in responses to the question, "In your own words, how would you describe the situation?"

The structural form of responses when an individual uses the shaping mode to describe a situation is operationally defined as "a label without definition or specification." A "label" is a word or phrase used to name a set. Labeling a set without specifying the elements it contains or defining a specific criterion for including elements in it indicates that an individual is using a previously defined set instead of creating a new one.

Shaping involves reasoning in which an individual uses existing sets and does not construct new ones. A set is a category which contains specific elements or elements meeting specific criteria. For example, a set can be specified as containing the letters A E I O U, or a set can be defined by the criterion of including all letters which are vowels.

The lack of definition or specification for a label referring to a set signifies that the elements of that set have already been established. Since a new set has not been constructed, an individual is using the shaping mode.

For example, when asked the question, "How would you describe the situation?" a person might answer, "It is a dilemma." This response would be classified as "shaping" because the person describes the situation with the label, "dilemma," but does not define or specify what makes it a dilemma.

The structural form of responses when an individual uses the reflecting mode to describe a situation is operationally defined as "a label defined by one or more specific elements, or two or more specific elements defining an implied label." Defining a label, or specifying the elements of a set, even without an explicit label, indicates that a new set has been constructed. The reflecting mode involves the construction of primary sets.

For example, a response exhibiting the structural characteristics of the reflecting mode might be, "This is an ethical dilemma. I am being asked to compromise my principles." This example would be classified as "reflecting" because the label, "ethical dilemma," is defined by the compromise of his or her principles. Another example of a response that demonstrates the reflecting mode is, "I am being asked to compromise my principles, but the whole company is on the line." In this second example, the

subject cites two elements which constitute the situation, compromise of principles and threat to the company, but he or she does not use a label.

The structural form of responses when an individual uses the extrapolating mode to describe a situation is operationally defined as "a series of connected events evolving over time." An "event" is a particular kind of primary set; specific circumstances are elements combined into a discrete episode. For an individual to perceive a connection, or interaction, among events requires the extrapolating mode of reasoning.

The extrapolating mode involves the construction of interactive primary sets. In other words, one primary set leads to another primary set, and so on. Extrapolating involves an inherently dynamic quality which results in a description of the situation as an interactive series of events. In contrast, reasoning is reflective when an individual uses multiple elements to describe an event, even an event which occurred over time, because the elements are used collectively to define "the event."

An individual employing the extrapolating mode might respond, "The company accepted a large order with a short lead time for delivery. Then production got behind because of quality control problems. This delay put the company in a tough situation, so the V.P. of Marketing called a meeting and told me to participate in falsifying the documentation."

The response would be classified as "extrapolating" because it describes a series of related events evolving over time.

The structural form of responses when an individual uses the parallel processing mode to describe a situation is operationally defined as "a scenario with possible connections among multiple issues and/or events." The parallel processing mode is employed when an individual constructs partial secondary sets--sets which contain both primary sets and individual elements.

As used in this paper, the term "scenario" means a description of the interconnected aspects of a drama; it captures the two critical factors associated with parallel processing. The first involves an individual's ability to construct multiple concurrent, or parallel, processes consisting of interactive primary sets. The second relates to an individual's ability to consider possible relationships among the parallel processes. These relationships can be the interaction of either elements on one hand (individual issues, such as competition from company A) or primary sets on the other (events, such as preparation of a proposal).

Perception of possible interaction among various factors, either elements or primary sets, not just over time as with the extrapolating mode, but also among concurrent processes is the essential characteristic of this mode. For example, an individual using parallel processing might describe a situation by saying, "I think this company was

probably in need of some new business. It could have been that they were suffering from poor management, or it could be that they were just operating in a very competitive market. In any case, the company took a large order from a potentially significant customer. How much of a role the manufacturing department played in the bid is not stated, but people in manufacturing realized that the order could not be completed to specification within the time frame established in the contract. The marketing V.P., who could have been under pressure from several directions himself, called a meeting with those of us working on the project and demanded our cooperation in circumventing quality control procedures. What the product will be used for, what political pressures are involved, what the organizational relationships are--none of these details have been provided. However, it is clear that throughout this process there has been a lack of effective communication and long term orientation."

In this example, the subject refers to numerous aspects of the situation which could possibly be interacting. Although individuals employing parallel processing may describe an event as moving forward in time, they are also able to think back in time and reconsider the implication of previous decisions and circumstances as well as their relationship to one another.

Section II--Description of Cause

This section discusses the definitional statements hypothesized to reflect the structure of each of the four cognitive modes in response to the question, "What caused this situation?"

An individual using the shaping mode describes the cause as "a single factor in a one-step process." Individuals employing the shaping mode use existing sets instead of constructing new sets. Describing causality as a single factor in a one-step process does not involve the construction of a new set but simply involves labeling a direct causal process.

For example, when responding to the question concerning causality, an individual using the shaping mode might say, "The short deadline caused it." A single factor, the short deadline, is identified as the cause. The nature of causation is direct and complete in a single action; how the single factor creates the results is unspecified.

The structural form of responses when an individual uses the reflecting mode to describe causation is operationally defined as "a single factor defined by one or more specific elements in a one-step process; or two or more specific elements defining an implied single factor in a one-step process." The reflecting mode is defined as reasoning which involves constructing new primary sets.

When a person sees "the cause" as a "thing" defined by specific elements, he or she is thinking in the reflecting mode.

An example is, "Poor communication caused it. The marketing and production people were not communicating very well." Another example is, "The marketing and production people were not communicating well. The production people weren't keeping up the quality. Also, the Marketing V.P. was dishonest. All of these factors make up the basic cause." Both examples involve constructing a new set which is identified as "the cause."

The structural form of responses when an individual uses the extrapolating mode to describe causation is operationally defined as "a series of related factors in a multi-step process." In other words, A caused B, which caused C. Extrapolating involves the construction of interactive primary sets. A, B, and C represents sets; interaction among them is seen as a causal link.

A hypothetical example of such a response is, "The need for business caused the marketing department to accept a contract with short lead times. The short lead times caused the production department to fall behind schedule. Management recognized that without changing something they would not be able to ship the order on time. So, management decided to circumvent the normal quality control procedures. Their decision has put me in a tough spot." Each statement reflects a factor in a causal chain resulting in the current

situation. No one factor is seen as the cause. In fact, a key characteristic of extrapolating is that an individual perceives a series of factors, or sets, which "caused" a situation, instead of defining a set as "the cause" of a situation.

The structural form of responses when an individual uses the parallel processing mode to describe causation is operationally defined as "a series of related factors in a multi-step process." Parallel processing involves the construction of partial secondary sets. Such construction of partial secondary sets requires that one consider how a variety of specific factors, both elements and primary sets, might oalesce in a casual relationship.

A hypothetical example of this type of reasoning is, "There are at least two levels of analysis which converge to produce the current situation. The first is the market situation of the company and the second is the internal politics involved. There is probably a third as well, which is the internal production capabilities of this particular assembly line. The market situation forces them to accept a contract with short deadlines and harsh penalties. It also makes this particular contract even more important. It is also the market, however, which will respond most drastically if they ship a bunch of faulty seals. The company politics also plays a role in this scenario. If marketing and production do not communicate effectively on their contract development, there must be some

reason--either poor policy or poor implantation of a good policy. And where is the president in all of this? He should be controlling the interaction between marketing and production. It is not clear that he even knows what is going on, and that always leads to performance problems. One other set of factors involves the issue of whether the high level of rejection by quality control is a function of poor materials, poor workmanship, poor supervision, faulty equipment, or simply that the specifications are beyond the capability of the current production system. Whatever the reason is, it should be identified and dealt with so that the same problem doesn't occur again."

This example contains the interaction among three processes--market forces, internal politics, and production capabilities--seen at different points in time and at various levels of detail.

Section III--Description of Alternative Actions

The third section of the typology contains the definitional statements hypothesized to reflect the structure of each of the four cognitive modes in response to the question, "What are your alternative courses of action?" Like the previous two, this section provides the theoretical rationale and examples for the definitional statements proposed.

The structural form of responses when an individual uses the shaping mode to describe alternative actions is operationally defined as "a choice of either accepting or rejecting a given action." Shaping produces a binary choice, A or not A, because new sets, in this case in the form of alternative actions, are not constructed.

A possible example of such a response is, "I could go along with them or not." Possible actions are seen as doing what is asked, "going along with them," or not doing what is asked. No new set is constructed.

The structural form of responses when an individual uses the reflecting mode to describe alternative actions is operationally defined as "a choice of two or more specific actions." Creating alternative actions requires the construction of sets. Thus, a response resulting when an individual uses the reflecting mode contains the construction new sets with of two or more specific elements.

A hypothetical response with this structure is, "I could go along with the Marketing V.P., or I could go to the president and express my concern." In this example, development of specific actions indicates the construction of new sets.

The structural form of responses when an individual uses the extrapolating mode to describe alternative actions is operationally defined as "one sequence of action with two or more alternative choice points; or two or more unconnected alternative sequences of action." Extrapolating

requires a two-part definitional statement because the structure of this mode of reasoning can occur in two different forms. Jaques defines the extrapolating mode as reasoning which involves constructing interactive primary sets. The interaction among primary sets can occur as a choice of alternatives either along a single sequence of action or among multiple sequences of action. In either case, extrapolating is required to produce this type of alternative construction.

An example of a hypothetical response with the first type of structure is, "I would first go to my boss and explain my concern. If it appeared he wasn't going to take action, I would go to the president. If he didn't do something, I would have to decide whether I wanted to work for this company anymore." An example of the second form of response reflecting the extrapolating mode is, "One choice would be to go to my boss and explain my concern. Then with or without his support I would challenge the Marketing V.P. He would probably get mad and either ask me to quit or fire me. Another choice would be to go to the customer and explain the situation. They could either work with us to find a solution or they could cancel the order or they might take the company to court. In any case, I would probably quit the company." Each of these examples demonstrates the sequential reasoning characteristic associated with the extrapolating mode.

The structural form of responses when an individual uses the parallel processing mode to describe alternative actions is operationally defined as "two or more interactive sequences of action." The development of alternatives represents the construction of sets; when alternatives, or sets, involve both primary sets (such as choice points) and direct elements (such as specific facts) the type of set produced is a partial secondary set. Therefore, parallel processing, which involves constructing partial secondary sets, is required to produce interaction among multiple sequences.

A possible example of this type of response is, "I could begin investigating the source of our inability to meet quality control standards. If the problem were something which could be resolved, I would develop a plan to solve it and take it to my boss. I would simultaneously begin snooping around to find out the Marketing V.P.'s relationship with the president. I would probably also get my resume out and bring it up to date. I could either raise my concern overtly or covertly, depending on the source of the problem, my sense of the V.P.'s political position, and my job prospects. If I went overt, I would write a memo to my boss and copy to the V.P., outlining my concern over the action. If I went covert, I would go to our corporate attorney and discuss it with him. Again, depending upon my current opportunities and long-term career situation, I would continue through a variety of means to be sure that

the present course of action was fully understood by senior management. If the current course of action were not changed, I could either be asked to be moved to another job or I could quit."

This example demonstrates the interaction among several parallel processes. The multiple processes are actions to determine the source of the problem, the V. P.'s political position, and career options. Aspects of the interaction among these processes could affect the way the subject raises his concern.

Section IV--Selection and Justification

The final section of the typology contains the definitional statements hypothesized to reflect the structure of each of the four cognitive modes in response to the question, "What would you do, and why.?" Following the organization of previous sections, this discussion provides the theoretical rationale and examples for the definitional statements proposed.

The structural form of responses when an individual uses the shaping mode to describe selection and justification of action is operationally defined as "a single action justified by a single reason." No new sets are constructed when a person uses unspecified labels to describe the action and justification. An example of a hypothetical response is, "I would not go along with them

because it is wrong." No new sets are constructed in this response, so it would be classified as "shaping."

The structural form of responses when an individual uses the reflecting mode to describe selection and justification of action is operationally defined as "one or more specific actions, each justified with multiple reasons." Both developing action plans with multiple specific elements and combining multiple reasons into a single justification reflect the construction of a new set, and therefore, the reflecting mode.

A theoretical example of a response with this structure is, "I would go to my boss with my concern because I would not want to be involved in any unethical behavior, and I would not want to hurt my boss or my company by my action." The one action is supported by multiple reasons; the multiple reasons combine to create a new set with the implied label "justification."

The structural form of responses when an individual uses the extrapolating mode to describe selection and justification of action is operationally defined as "one or more sequences of action, each with two or more choice points, each choice point justified with serially connected consequences and/or principles." Responses with serial choice points and serially connected justifications reflect interactive primary sets.

A theoretical example of a response reflecting the extrapolating mode is, "I would go to my boss and express my

concern. If he was supportive of my position, I would let him run with the ball because he is higher in the chain of command. If he were not supportive, I would document my concern in a memo and send it to the president, because I would want to cover myself as well as give him a chance to take appropriate action. If no action resulted from my memo, I would quit because I don't want to be associated with a company like that. I would probably be eventually squeezed out anyway for having caused trouble. "This example demonstrates a series of actions with justification provided for each choice point, which leads to the next choice point followed by another justification of the selected alternative path.

The structural form of responses when an individual uses the parallel processing mode to describe selection and justification of action is operationally defined as "two or more interactive sequences of action, each choice point justified with multiple interactive consequences and/or principles." Again, the interaction among sequences described in the above definitional statement requires the construction of partial secondary sets.

An example of a hypothetical response with this structure is, "I would go to my boss and express my concern. At the same time, I would get out my resume and bring it up to date. If my boss were unreceptive to my concern, I would put some feelers out into the marketplace for a new job because I wouldn't want to find myself without a job. If it

looked like I had a good chance of getting another job, I would go to the president because he should have an opportunity to resolve the problem. If he were not responsive, I would begin to actively pursue a job with another company because I would not feel right working for a company like that. Depending upon how I had been treated through this process, I would either blow the whistle to the customer to get even, or I would just go quietly because of loyalty."

The preceding examples demonstrate how the Quintave Typology can be used as a classification tool. But before the tool can legitimately be applied in research, two critical questions concerning the typology must be addressed. First, are the definitional statements in the typology valid reflections of the four cognitive modes in Jaques' quintave model? Second, can the typology be reliably employed to classify the type of reasoning used by individuals when responding to moral problems? These are the two questions which were addressed in the research described in the following chapters.

CHAPTER FOUR

HYPOTHESES

This chapter presents a formal statement of the hypotheses used to test the validity and reliability of the Quintave Typology of Reasoning.

Hypothesis One

The first hypothesis tests the content validity of the Quintave Typology of Reasoning. The null hypothesis and alternate hypothesis number one are as follows:

Ho1: The definitional statements in the Quintave Typology of Reasoning are not valid reflections of the cognitive modes described in Jaques' Quintave Model of Cognitive Functioning.

Ha1: The definitional statements in the Quintave Typology of Reasoning are valid reflections of the cognitive modes described in Jaques' Quintave Model of Cognitive Functioning.

Decision Rule: Reject Ho1 if the mean value of the single sample T-test is greater than .75.[87]

Hypothesis Two

The second hypothesis tests the interrater reliability for users of the Quintave Typology of Reasoning as a classification scheme. The null hypothesis and alternate hypothesis number two are as follows:

Ho2: Responses to moral problems cannot be reliably classified using the Quintave Typology of Reasoning.

Ho2: Responses to moral problems can be reliably classified using the Quintave Typology of Reasoning.

Decision Rule: Reject Ho2 if the coefficient kappa of interrater reliability is below .4.[88]

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[87]Anne Anastasi, Psychological Testing, 4th ed. (New York: MacMillan Publishing Co., 1976), p. 134.

[88]Joseph L. Fleiss, Statistical Methods for Rates and Proportions, 2d ed. (New York: John Wiley & Sons, 1981), p. 225.

CHAPTER FIVE

METHODOLOGY

This chapter describes the methodology for gathering and analyzing the data used to test the hypotheses stated in the previous chapter.

Data Gathering for Hypothesis One

The first hypothesis addresses the nature of the relationship between the definitional statements in the Quintave Typology and the cognitive modes in Jaques' Quintave Model. To test this hypothesis, three acknowledged experts in SST matched each of the typology's sixteen definitional statements with one of the cognitive modes.

Three individuals recognized by Elliott Jaques as experts in his theory were selected to implement the procedure for testing the hypothesis. Each of the experts independently matched the sixteen definitional statements in the typology with the cognitive mode he or she thought the statement reflected. The materials used for the procedure included a page with Jaques' definitions of the four cognitive modes and a packet of sixteen pages, each with one

of the definitional statements from the Quintave Typology and a place for the experts to indicate which cognitive mode he or she believed the statement expressed. Examples of the materials are included in Appendix A.

Each expert independently read the definitional statements and indicated the cognitive mode which he or she thought was reflected in each definitional statement. Eventually, all of the experts matched each of the sixteen definitional statements with one of the four cognitive modes. Their responses comprise the data for the analysis described in the next chapter.

Data Gathering for Hypothesis Two

Hypothesis Two tests whether the Quintave Typology produces sufficient interrater reliability to merit its use in classifying the cognitive mode reflected in responses to moral problems. The analogy of the color chart, as discussed in the Introduction, may help clarify the point of this hypothesis. Testing this hypothesis is like testing the reliability of using a newly produced color chart to identify the color of interior wall paints. Users of the color chart should be able to consistently agree upon the color of paint used on different walls in a house. If they cannot, the color chart is of no use as a tool for an interior decorator. If, on the other hand, the color chart provides the basis for consistently identifying the color of

paint on the walls, it becomes a valuable tool for people interested in interior decorating. Similarly, the objective of this research is to test the use of the Quintave Typology as a tool for classifying the reasoning used to respond to moral problems.

Testing the reliability of the color chart as a tool requires painted walls. If the color chart contains all possible colors of interior wall paint, any painted walls will adequately serve the purpose. The walls used, however, must include each color on the color chart in order to test the entire color chart. Other questions about the walls, such as, whether the four walls in a room match one another, or whether the walls match the furniture, or whether the person who owns the house likes the colors are not relevant questions for testing the reliability of the color chart. While these are critical questions for an interior decorator using the color chart to design someone's home, they are not essential for testing the tool. In the same way, testing the reliability of the Quintave Typology requires responses to four specific questions concerning moral problems. Any such responses would adequately serve the purposes of this research.

If the typology proves to be a reliable tool, numerous possible applications exist. The current research, however, is specifically limited to testing the reliability of using

the typology as a classification tool. This limitation provides the rationale for the methodology designed to test Hypothesis Two.

The color chart analogy will be used as a point of reference when describing the methodology used to collect the data used to test Hypothesis Two. Gathering the data involved: 1) interviewers who recorded responses to four specific questions concerning two scenarios which contained moral problems; and 2) two raters who classified these responses using the Quintave Typology. The interrater reliability of these classifications is calculated in the next chapter. The following sections discuss the subject population, the rationale for the scenarios, the process for conducting the interviews, and the process for classifying the responses.

Subject Population

The subject population is the source of the responses which were classified and not the object of the classification process. The typology is designed to be used to classify responses, not to classify the individuals who produce the responses. Therefore, the results of this research are not dependent upon any demographic characteristics of the subject population used as respondents.

Two important questions arise from the focus on the responses instead of the respondents. The first concerns the

appropriateness of separating the response from the respondent when exploring moral problem solving. Moral problem solving inherently involves an individual who applies moral values. How can this process be discussed without any consideration being given to the individual who produces the responses?

Aspects of the color chart analogy help address this question. An interior decorator's use of a color chart always involves a specific situation. Customer preference, furniture style, and carpet color are all relevant when selecting a color of paint for a wall. A color chart is used to help select the color of paint which "fits" the situation. But, before the color chart can be put to its intended use, its reliability as a tool for identifying colors must tested.

The same is true of the Quintave Typology. Moral problem solving inherently involves a specific individual in a specific situation. The individual's values and demographic characteristics are obviously relevant and may affect the type of reasoning he or she uses when responding to moral problems. But before addressing the personal or environmental factors which might influence the type of reasoning used by an individual, a method for classifying types of reasoning must be demonstrated to be reliable. Until the Quintave Typology's reliability is tested, its possible applications must wait. Why, how, who, or other questions about the source of the responses used to test the

typology's reliability are not relevant within the scope of the current research.

The population chosen for the current research is fifty Baylor University business school students and faculty members. The decision to use this subject population was made on the basis of convenience.

A second question concerns the requirement that responses reflecting each of the cognitive modes be obtained from the subject population. This question addresses the need for an adequate number of responses of each type and does not concern the characteristics of the respondents who gave the responses. Which individuals used which type of reasoning is not relevant for testing the typology. However, one application of the typology in future research might be to explore what factors do affect the type of reasoning used to respond to moral problems, but that is not within the limitations of the current research. The critical requirement is that all of the cognitive modes be represented in the responses classified.

The subject population needed to include individuals with adequate cognitive power to function in the parallel processing mode, to address the requirement for comprehensive representation. In Jaques' work with cognitive power, he hypothesizes that specific amounts of cognitive power are required for individuals to be able to use each cognitive mode. He also contends that cognitive development occurs along one of several tracks, each track

reflecting a different rate of cognitive development. According to his model, cognitive power increases with age, although development ceases at a different age for each track.[89] Since faculty members represent an older age group than students, including twenty faculty members in the population increased the probability that all four of the cognitive modes would be present among the responses gathered. And the responses obtained from these fifty subjects did, in fact, include all four types of reasoning.

Rationale for Scenario Content

To address moral problem solving specifically, instead of problem solving generally, the scenarios used in this research must contain moral problems. As discussed in Chapter Two of this dissertation, a problem is defined as a moral problem when someone faces a situation in which his or her decision will affect the well-being of persons. The scenarios used meet the definition's criteria because the subject's choice of action has identifiable consequences which affect others' well-being. Copies of the two scenarios are included in Appendix B.

In the first scenario, a sales manager is faced with a directive from his management to break a commitment he has made to another company. The decision he faces has possible consequences which will affect the well-being of

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[89]Jaques, "Development of Intellectual Capability," p. 128.

individuals in both of the companies. First, breaking his commitment could hurt the persons from the other company who had spent time and money on the project based upon the sales manager's commitment.

Second, not following the directive could result in his losing his job, which would have possible implications for both him and his family. Also, his decision to not change the proposal to incorporate a better product could cause his company to lose the procurement, which would affect individuals within his own company as well as other partners on his team.

In the second scenario, a production foreman is involved in a conspiracy to falsify quality control documents. The decision he must make has potential effects on the well-being of himself, his management, other employees of his company, employees of the customer, and eventual end-users of the equipment containing the faulty product.

Although the content and structure of a problem may affect the type of reasoning an individual uses in response to it, this research only tests the typology as a reliable guide for classifying whatever responses are given. Therefore, other content and structural issues involved with the scenario construction are immaterial to this research.

Interview Process

The interview process included tape recording subjects' responses to four questions about each of the two scenarios. A "response" is defined as all of the words used in answering each of the questions. If a subject would not, or could not, respond to a particular question, the subject would have been excluded from the subject population; however, this did not occur. As previously discussed, the four questions, which correspond to the four components of the problem solving process, are:

1) In your own words, how would you describe the situation?
2) What caused this situation?
3) What are your alternative courses of action?
4) What would you do, and why?

In most research involving open-ended questions, interviewer influence is a major concern.[90] For the current research, however, any influence the interviewer might exert on the subject is immaterial. Although the interviewers might influence the mode of reasoning used, their influence cannot invalidate this research's objective of testing the typology's reliability as a classification tool. Any response is satisfactory since responses, not respondents, are being classified.

The structure of the interview produces four discrete

[90]Anastasi, Psychological Testing, pp. 193-195.

responses corresponding to the four components of the problem solving process which were incorporated into the design of the typology. The typology is not designed to deal with a random pattern of responses. More than four responses from a single subject could occur as a result of discussion between the interviewer and the subject. Therefore,to avoid nonclassifiable responses, the instructions read to each subject inform him or her that the interviewer will not answer any questions during the interview.

The interview process included the following steps. First, the interviewer read the instructions to the subject. Then, the subject was given Scenario One and asked to read it. After the subject read Scenario One, the interviewer asked the four questions, allowing at least a five-second pause after the subject stopped talking before asking the next question. When finished with the first scenario, the subject was given the second scenario and asked the four questions in the same format as before.

After the interviews were completed, the tapes were transcribed and each response was given an identification number. Each response, in turn, was transcribed on an individual piece of paper so that responses were separated completely from the respondents. Responses more than one page long were put on additional pages and stapled together. The responses were then ready to be classified.

Procedure for Classifying the Responses

Classifying the responses involved identifying the cognitive mode reflected in each response. Two raters independently analyzed the structural characteristics of a response. Then from the appropriate section of the typology, each rater selected the definitional statement which most closely resembled that response's structure. The response, in turn, was classified as the cognitive mode associated with that definitional statement in the typology. For example, in response to the second question, "What caused this situation?," a subject might say, "Competition caused it." A rater then would analyze the structure of this response in relation to the four definitional statements on causation contained in the Quintave Typology. These statements are:

Cognitive Mode	Structural Form of Responses
Shaping:	a single factor in a one-step process.
Reflection:	a single factor defined by one or more specific elements in a one-step process; or two or more specific elements defining an implied single factor in a one-step process.
Extrapolating:	a series of related factors in a multi-step process.
Parallel Processing:	probable interaction among multiple processes.

A response such as, "The competition caused it," most reflects the structural characteristics of the shaping mode because "the competition" is the single factor identified as the direct cause. This response, therefore, would be classified as "shaping."

Elliott Jaques and I independently classified the eight responses from each subject. Both raters' classifications are included in Appendix C. These data were then used in the analysis described in the following section.

Analysis of Results

This section presents an analysis of the data for testing the hypotheses set forth in Chapter Four.

Data Analysis for Hypothesis One

The first hypothesis tests the content validity of the typology's definitional statements. Specifically, the hypothesis is designed to test whether the definitional statements of the Quintave Typology reflect the cognitive modes proposed by Jaques.

The data are responses which match one of the four cognitive modes with each of the sixteen definitional statements. A response is said to "match" if the cognitive mode selected by an expert is the same as the mode proposed in the Quintave Typology to be associated with that definitional statement. A response is labeled a "mismatch" if the cognitive mode selected by the expert is not the same as the mode theoretically reflected by that definitional statement in the Quintave Typology.

For example, if the expert selects a shaping mode for the definitional statement, "a single factor in a one-step process," the response is scored as a match. If any of the

other modes are selected, the response is scored as a mismatch. Table 1 summarizes the number of matches and mismatches for each of the three experts.

TABLE 1
SUMMARY OF MATCHES AND MISMATCHES FOR THREE EXPERTS

	MATCH	MISMATCH
EXPERT A	15	1
EXPERT B	12	4
EXPERT C	16	0

A single sample T-test tests the significance of the data. Each match is assigned a value of 1.0; each mismatch is assigned a value of 0.0. The scores from all of the experts are added together and divided by forty-eight (16 x 3) to produce a mean value, as shown in Table 2 below.

TABLE 2
MEAN VALUE FOR SINGLE SAMPLE T-TEST

$$\frac{43}{48} = .89$$

Since the mean of .89 is higher than .75, Ho1 is rejected, and the content of the Quintave Typology can be said to be a valid reflection of Jaques' Quintave Model of Cognitive Functioning.

Data Analysis for Hypothesis Two

This analysis determines the interrater reliability of the classifications obtained from the method described in

the previous chapter. The coefficient kappa, which provides a measure of agreement between any two raters, is the statistical test used to calculate interrater reliability.

Four hundred responses were independently classified by two raters and constitute the data base. A response is considered a match if both raters classify it as reflecting the same cognitive mode and a mismatch if the raters' classify it as reflecting different modes.

The responses were arrayed in a table indicating the number of times each mode was selected. The complete table is included in Appendix D. As an example, responses from three subjects are shown in Table 2.

TABLE 3
SAMPLE LISTING OF RESPONSES CLASSIFIED ACCORDING TO COGNITIVE MODE

Scen/Subj/Quest			Shaping 1	Reflecting 2	Extra-polating 3	Parallel Processing 4
I	1	A	2	0	0	0
		B	2	0	0	0
		C	0	2	0	0
		D	0	2	0	0
	2	A	1	1	0	0
		B	0	2	0	0
		C	0	2	0	0
		D	0	2	0	0
	3	A	0	2	0	0
		B	0	0	2	0
		C	0	0	1	1
		D	0	0	0	2

In the table above, the response of subject 1 to question A is a match because both raters classified it as shaping. Alternatively, the response of subject 2 for

question A is a mismatch because one rater classified it as shaping and the other classified it as reflecting. Three hundred and one of the four hundred responses were matches. The following table contains the total number of responses classified in each category.

TABLE 4
TOTAL NUMBER OF RESPONSES CLASSIFIED ACCORDING TO COGNITIVE MODE

Responses	Shaping	Reflecting	Extrapolating	Parallel Processing
400	272	311	123	94

A kappa coefficient was calculated for overall interrater reliability and for interrater reliability within each of the four cognitive modes. Kappa is an interclass correlation coefficient widely used as a measure of interrater reliability for cases of nominal data.[91] The results are shown in Table 5.

TABLE 5
KAPPA VALUES FOR OVERALL INTERRATER RELIABILITY AND FOR INTERRATER RELIABILITY WITHIN EACH COGNITIVE MODE

Overall K = .66

Shaping K^1 = .72

Reflecting K^2 = .53

Extrapolating K^3 = .68

Parallel Processing K^4 = .82

[91]Fleiss, Statistical Methods for Rates and Proportions, p. 230.

Unlike coefficients calculated for ordinal data which can be given a confidence level in terms of degrees of significance, the degree of agreement when using kappa can only be discussed in terms of general acceptability. Landis and Koch offer acceptable ranges of values for kappa with respect to the degree of agreement.[92] For most purposes, they "consider values below .40 to represent poor agreement beyond chance, and values above .40 to represent good agreement beyond chance."[93] Since overall kappa value of .66 is above .40, the null hypothesis stated in Chapter Three is rejected and the alternate hypothesis is accepted. All of the kappa values for the data reported here represent good interrater reliability.

Now that both of the null hypotheses have been rejected, the following chapter discusses some of the implications of this research and suggest several avenues for future research which might be pursued.

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[92] Ibid.

[93] Ibid.

CHAPTER SIX

DISCUSSION

Development of a reliable classification tool represents a necessary first step in exploring important questions concerning how different modes of cognitive functioning affect moral problem solving. In Chapter One I posed two such questions which could be explored using the Quintave Typology. Those questions are:

- Does conflict concerning "the moral" course of action result among groups or individuals when they use different types of reasoning to deal with a moral problem?
- Do situational and/or personal factors affect the type of reasoning employed by individuals when responding to moral problems?

Before discussing possible future research addressing these two questions, in the following section I will review specific contributions made by the current research. A final section explores implications of this research for the concept of moral development.

Contributions of the Current Research

This section reviews only those contributions related to the objectives set forth in the Introduction. Those objectives were:

1) to use the cognitive-structural approach to develop a typology of reasoning based on Jaques' Quintave Model of Cognitive Functioning;

2) to test the typology's content validity as a reflection of the cognitive modes proposed by Jaques and to test its reliability as a research tool for classifying the types of reasoning people use when responding to moral problems.

In meeting these two objectives, I make theoretical contributions both to Jaques' Stratified Systems Theory (SST) and to the cognitive-structural approach as a way of classifying moral reasoning. The following discussion reviews these contributions.

First, this research provides an empirical verification of Jaques' Quintave Model and demonstrates that the model can serve as a basis for classifying the types of reasoning used when responding to moral problems.

Second, this research contributes to the cognitive-structural approach by developing a classification scheme which is structurally defined and response-oriented. These contributions are significant in relation both to previous work using the cognitive-structural approach, most

notably Kohlberg's, and in relation to other classification approaches employed within the broader field of Moral Psychology.

As previously stated, the assumption that different modes of cognitive functioning result in distinct types of moral reasoning underlies the cognitive-structural approach. However, until now no classification scheme defined in purely structural terms has existed to test that assumption.

Previous methodologies required researchers to infer the structure of cognitive functioning based upon the content of responses. For example, in a recent publication regarding his methodology, Kohlberg states, "The test scorer must know the underlying theory and function as a 'clinician' who can infer structures from the content in responses.[94] In contrast to inference-based classification schemes like Kohlberg's, the current research provides a typology which does not require inferences based on content, because the Quintave Typology is defined soley in structural terms.

The structurally defined classification scheme also enhances the theoretical integrity of the cognitive-structural approach vis-a-vis alternative approaches for classifying moral reasoning. Kohlberg and others who have applied the cognitive-structural approach

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[94] Kohlberg, Essays on Moral Development, p. 402.

have been criticized because of their inability to distinguish adequately between structure and content in moral reasoning. Such criticism could be avoided by researchers using the Quintave Typology because it allows users to classify responses according to the structure of reasoning without reference to the moral content.

In addition, the response-oriented classification tool developed in this research contrasts with the respondent-oriented methodologies of other researchers who have used the cognitive-structural approach for classifying moral reasoning. Kohlberg's methodology, for example, classifies a respondent in terms of his or her stage of moral development.[95] Similarly, the methodology employed by Rest classifies respondents based upon how they define moral issues.[96]

Classifying respondents rather than responses masks the fact that many people use more than one type of reasoning. For example, Kohlberg's methodology classifies an individual according to the type of reasoning he or she uses most often. Yet, in one sample of his data, over 80 percent of the respondents employed multiple levels of reasoning.[97]

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[95]Ibid., pp. 395-425.

[96]Rest, Judging Moral Issue, pp. 85-115.

[97]Kohlberg, Essays on Moral Development, pp. 594-620.

Similarly, the data obtained in the current research show that 68 percent of the subjects used at least two modes and 28 percent used three or more.

When an individual uses multiple types of reasoning, I call that phenomenon the "dynamic quality" of cognitive functioning. Since my data indicate that 28 percent of the subjects use three or four different types of reasoning when responding to the four questions integral to the methodology, one can conclude that some individuals do not use the same mode at all times. This finding is at variance with the predominant thrust of theory and research in the field.

Even Jaques has focused much of his work on identifying an individual's cognitive stratum. Thus, as discussed in Chapter Two, he asserts that a Stratum III individual, for example, would use the extrapolating mode of reasoning regardless of the particular problem with which he or she was confronted. In contrast, I suggest that labeling someone as an extrapolating person, for example, is misleading. Incorporating the dynamic quality of cognitive functioning into Jaques' Quintave Model leads to the proposition that an individual can use the modes equal to or lower than his or her maximum capability. Following the above example, a person with cognitive power adequate to operate at Stratum III could use the extrapolating mode as well as the shaping and reflecting modes within Quintave B. This person would

also be able to use all four modes of reasoning within Quintave A.

Jaques has not provided a method for identifying the quintave in which an individual's reasoning takes place, and I do not attempt to address that issue in this research. However, future research using the Quintave Typology might illuminate the dynamic quality of cognitive functioning within any one quintave.

The possibility that cognitive functioning is dynamic instead of stable leads to troublesome questions about methodologies which classify respondents. For instance, do individuals vary in mode of response as a function of the type of problems they confront? What is the value of generalizing about an individual's predominant type of reasoning if cognitive functioning is dynamic?

In contrast, users of a methodology which classifies responses can answer not only the previous questions but also such questions as: What causes an individual to use different types of reasoning? Do identifiable patterns exist in the way individuals and groups respond to moral problems? Can someone learn to consistently use a specific mode of reasoning when responding to moral problems?

The following three sections highlight the potential significance of the response-oriented approach by discussing possible issues for future research opened by the development of the Quintave Typology.

Exploring the Structural Dimension of Conflict

Researchers could use the Quintave Typology to explore the possibility that conflict results when parties use different types of reasoning to deal with a problem. Although conflict involving structural differences could occur with any type of problem, such conflict may be more common when dealing with problems requiring moral choices than with those involving work tasks.

Work tasks, defined by Jaques as an assignment in an accountability hierarchy to produce specified results, are ultimately objective in nature.[98] According to Jaques, that objectivity stems from the fact that when a superior assigns a task to a subordinate, the superior has the authority to judge whether the task is completed "correctly." A task, therefore, has an objective quality because a superior constructs a task, articulates that task, and judges the subordinate's performance on the task.

Jaques further asserts that the cognitive complexity required to handle a task adequately must be isomorphic with the complexity of the task itself.[99] In other words, the structure of a task determines the type of reasoning

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[98]Jaques, "Cognitive Complexity," p.3.

[99]Ibid., p.2.

required to complete the task satisfactorily.

Moral problems, on the other hand, do not have an inherent structural complexity. How one constructs problems which require moral choices is ultimately the result of each individual's using his or her own subjective reasoning processes. Since no one person or group has the ultimate authority to judge "the right" way to engage in moral reasoning, "the appropriate" level of cognitive complexity employed to respond to a moral problem is always a matter of subjective judgment. Therefore, individuals may not agree on the way a moral problem should be constructed and, as a consequence, they might experience conflict because they employ different types of reasoning to formulate their positions.

Conflict of this type could result, therefore, not because parties hold values with different content, but because they employ different levels of cognitive complexity in trying to resolve their conflict. For example, two people might agree that abortion is morally wrong. Yet, they might experience conflict about how to express their opposition to abortion because they use different types of reasoning to formulate the problem. An individual who uses the shaping mode, for instance, might contend that abortion should be outlawed because "abortion is murder and murder is wrong." Alternatively, a second person, using the extrapolating mode, might express his or her opposition to abortion by

advocating education about the harmful consequences of abortion on society.

The Quintave Typology could also be used to explore the possibility that structurally-based conflicts occur, not only between individuals, but also between groups. Similiar to individuals, groups experiencing conflict may be unable to resolve their disagreements because they have formulated their arguments using different types of reasoning. For example, a dispute between labor and management over wage rates may be unresolved because one group uses the shaping mode and the other group uses the extrapolating mode.[100] Union members might argue that they should get a wage increase equal to the cost of living index because they have always gotten such an increase in previous contracts. Such an argument would reflect the shaping mode because the reasoning involves "a single action justified by a single reason."

On the other hand, management might employ the extrapolating mode to formulate their argument. For example, management might argue that wages should be kept low to compete with foreign suppliers. If sales decline, the company would have to cut production, which, in turn, would require the company to lay off workers. Lower production levels would also result in a greater fixed cost

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[100]Reader may want to refer to page 43 to review the definitions of the cognitive modes.

of production. Higher costs could then lead to closing the plant and eventually to bankruptcy for the company. The structure of this argument would reflect the extrapolating mode because the reasoning involves a sequence of actions with serially connected consequences.

A user of the Quintave Typology could determine whether the inability of these two groups to resolve their conflict was based, not in the content, but in the structure of their arguments.

Assuming that groups are not able to resolve such conflict because they are using structurally different types of reasoning, an intermediary might help translate each party's concerns into a structural mode that could be understood by each. For example, a labor arbitrator familiar with the Quintave Typology might construct a rationale for a particular course of action using a structure that each group could better understand, thereby enhancing the possibility of resolution.

By suggesting a structural intermediary, one assumes that a single individual has the necessary cognitive agility to intentionally shift from one type of reasoning to others. Questions about cognitive agility can be answered only after future research answers questions about the dynamic quality of cognitive functioning. The following section discusses how the Quintave Typology

might be used to explore what influences a person's type of reasoning.

Possible Factors Affecting the Type of Reasoning Used to Respond to Moral Problems

What factors affect the reasoning an individual employs when dealing with moral problems? The range of factors which might influence the type of reasoning an individual uses is potentially infinite. I selected two factors for discussion here because of their relationship to Jaques' previous work.

Time Available to Respond

The clock time available to respond to a problem may affect the type of reasoning used. Time available to respond differs from the concept of "time-frame" because it deals with a characteristic of a situation and not a characteristic of an individual. For example, an individual might suddenly face a problem which requires a response within seconds. In such a case the individual might use the shaping mode of reasoning because shaping is the least abstract mode. Since the higher up the hierarchy of cognitive modes one moves the more abstract the thought processes become, short response times might result in the use of lower modes of reasoning.

To explore such a possiblility, a researcher could construct a test that requires an immediate response to one scenario and allows several minutes, hours, or days of

consideration before requiring a response to a second scenario. If a less abstract mode of reasoning is consistently used to respond when an immediate answer is required than when longer periods of time are available, then response time could be considered to be a factor which influences the type of reasoning a given person uses.

Jaques' concept of compressed time may provide insights into how decision making might be affected when ample time is not available to deal with the absolute complexity of a particular task. Compressed time often occurs under extreme conditions such as combat.[101] A recent example is the shooting down of the Iranian airbus by a U.S. Navy ship. The captain had only four minutes to consider the wide range of data and possible alternatives.

Another potentially fertile area for applying the Quintave Typology is research which explores the effects of the social setting on the dynamic quality of cognitive functioning.

Social Setting of a Moral Problem

A social setting consists of the individuals or groups a person references when making a decision. A specific social setting of interest is organizational culture. Defining culture as "the set of important understandings

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[101]Jaques, "Cognitive Complexity," p.9.

(often unstated) that members of a community share in common," Vijay Sathe asserts that an organization's culture includes mutual understandings about its basic moral values.[102] He also suggests that the culture exerts a strong influence on decision making--including decisions which have moral implications.

Numerous researchers have demonstrated that organizational culture influences the values, behavior, and ethical considerations of its members.[103] With the Quintave Typology a researcher can explore the question, "Does an organization's culture foster a dominant type of reasoning used by its members when they respond to moral problems?"

To answer this question, a researcher could first classify the type of reasoning used by various individual members of an organization when responding to a specific moral problem. Then, one could assess whether they use the same mode of collective reasoning. Another approach might be to test for differences between the mode of reasoning used by individuals when responding to moral problems within the context of a particular organization and

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[102]Vijay Sathe, "Implications of Corporate Culture: A Manager's Guide to Action." Organizational Dynamics, Vol. 12, No. 2 (Autumn 1983), p.6.

[103]Lawrence B. Chonko and Shelby D. Hunt, "Ethics and Marketing Management: An Empirical Examination," Journal of Business Research 13 (1985) : pp. 339-59.

the mode of reasoning they use when responding to moral problems outside of that context.

If researchers find that an organization's culture dictates that its members use a single mode of reasoning for responding to moral problems, then it is possible that (1) an organization becomes vulnerable because its culture precludes adequate diversity of analysis when grapling with complex moral issues, and (2) individuals might become frustrated if their preferred type of reasoning differs from the organization's cultural norm. Those individuals, in turn, might feel their moral concerns are not appreciated.

In addition to serving as a useful research tool for exploring the dynamic quality of cognitive functioning, the current research also has implications for the concept of moral development.

Implications for the Concept of Moral Development

This section discusses two specific implications for the concept of moral development which emerge from the current research. First, the Quintave Typology challenges a cognitive-structural definition of moral development by providing the ability to differentiate one's level of cognitive functioning from one's level of morality perse. Second, the new classification scheme could provide a basis for reinterpreting Kohlberg's work to be understood as a theory of justice rather than a theory of moral development.

The Quintave Typology challenges the legitimacy of formulating a definition of moral development in cognitive-structural terms. As discussed in the literature review, Kohlberg and others who employ the cognitive-structural approach define moral development as the increasing adequacy of cognitive structures to deal more abstractly with moral problems. This definition of moral development fails to recognize that morality essentially concerns how one's behavior affects the well-being of others. The Quintave Typology provides a potential basis for distinguishing between the structure of the reasoning used to deal with moral problems and the value content used to assess one's level of morality.

The notion of assessing someone's level of morality implies that the assessor employs some criteria for distinguishing between behavior which is "more moral" from behavior which is "less moral." As discussed previously, each person ultimately determines his or her own criteria for judging morality. Therefore, assessing somone's level of morality is ultimately a subjective evaluation by the assessor. For example, an act which I consider to represent a high level of morality might, on the other hand, be judged by another person tc indicate a low level of morality.[104]

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[104]The first person pronoun is used when discussing moral judgments in order to emphasize the subjective nature of assessing the morality of someone's behavior. Using the first person does not suggest that my personal opinion provides an adequate basis for defining morality.

This dissertation does not attempt to provide criteria for assessing someone's level of morality. In fact, the results of this research suggest that using a cognitive-structural approach to define moral development is inappropriate because the structure of reasoning and the value content of morality are qualitatively different things.

The objective structural criteria provided by the Quintave Typology to classify the reasoning reflected in a response to a moral problem cannot be substituted for the subjective value judgment required for assessing the morality of someone's behavior. Neither the Quintave Typology nor any other classification scheme using the cognitive-structural approach provide the kind of criteria necessary for assessing the level of morality associated with any particular behavior.

The Quintave Typology does, however, provide a foundation for the argument that someone's level of morality is not necessarily determined by the type of reasoning he or she uses when responding to moral problems. No basis is found for suggesting a consistent relationship between the type of reasoning a person may use and the morality of the behavior the person actually implements. The fact that a person uses very simple reasoning processes when choosing

his or her course of action would not necessarily indicate that the individual has failed to develop morally.

For example, I might consider one person an extremely moral individual because his actions consistently conform to "accepted" moral standards even though he regularly uses the shaping mode to make moral choices. On the other hand, another person may use a high level of cognitive functioning when considering a moral problem, yet behave in a way I would consider immoral. This person certainly could not be considered morally developed. For instance, a financial "genius" who used high levels of cognitive functioning to develop his schemes but was convicted of insider trading would not be considered to have a high level of morality.

In addition to providing a basis for distinguishing between high levels of cognitive functioning and high levels of moral functioning, the research results also challenge the notion of classifying individuals according to their predominant mode. The possibility that cognitive functioning is dynamic undermines Kohlberg's assertion that a person's level of moral development can be ascertained by identifying the cognitive mode he or she most often employs.

For instance, a person might use the shaping mode to choose a moral course of action on one occasion and use the parallel processing mode to choose an immoral course of action on another. If individuals do not always use just one mode of reasoning, one's level of moral development could

not be established on a cognitive-structural basis. What, then, is Kohlberg's methodology measuring if not moral development?

The Quintave Typololgy provides a potential basis for reinterpreting Kohlberg's theory. Future research comparing the Quintave Typology and Kohlberg's stages might indicate that Kohlberg's stages of moral development are better understood as different concepts of justice--each of which reflects one of the modes of reasoning described in Jaques' Quintave Model. The following discussion outlines the hypothesized relationship between these two models.

My contention is that Kohlberg's first five stages represent five distinct formulations of the concept of justice, each reflecting the structural characteristics of a different mode of cognitive functioning. Kohlberg has dropped his proposition of a sixth stage, the universalization of justice, because it has never been empirically observed.[105] Likewise, I do not include the sixth stage in this analysis.

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[105]Kohlberg, "Essays on Moral Development," p. 270-74.

FIGURE 5

RELATIONSHIP BETWEEN THE QUINTAVE MODEL AND KOHLBERG'S STAGES

Stage		Cognitive Mode
I	Obedience and Punishment	Shaping
II	Instrumental Relativist	Reflecting
III	Interpersonal Concordance	Extrapolating
IV	Authority Maintenance	Parallel Proc
V	Social Contract	Shaping

Kohlberg's first stage, Obedience or Punishment, reflects the shaping mode. Justice at this level does not have an explanation; rules are simply "given," and the choice is to accept the rules or not.

The second stage, Instrumental Relativist, defines "justice" using the reflecting mode. Reasoning at this level involves identifying specific costs and benefits associated with any act and making a decision based on the net effect. The underlying structure of this stage corresponds with that of the reflecting mode because it requires one to construct primary sets consisting of specific elements.

Stage three, Interpersonal Concordance, contains the structure of the extrapolating mode. This stage is characterized by individuals attempting to conform to "others'" expectations; this stage involves assessing how other people might react to a particular behavior and

extrapolating how their reaction might, in turn, affect the decision maker. The extended series of action and reaction reflects the extrapolating structure of interactive primary sets.

Authority Maintenance, Kohlberg's fourth stage, reflects the parallel processing mode because the reasoning at this stage involves the interaction of multiple valid interests within an established system. "Justice" is defined by maintaining the rules that control the interaction among the many members of the social system. The specific rules must be maintained to assure the stability of the entire system. Breaking the rules threatens the delicate balance of the system--the system of interaction among parallel processes.

Stage five, Social Contract, reflects the structure of the shaping mode at the top of a quintave. The rules guiding action are still "given", they are just "given" by by one's own moral convictions instead of supplied by an external authority. Action is justified by a single dominant principle originating in one's own conscience.

Additional research could be conducted to test the relationships hypothesized above. The intent of this discussion has not been to make a definitive argument for the relationship between the two models, but only to identify one possible way of reinterpreting Kohlberg's stage theory in light of the Quintave Typology.

By providing the ability to distinguish between the cognitive-structural dimension and the value content dimension of moral problem solving, this research sheds new light on the concept of moral development.

Conclusion

This dissertation originated from my interest in how people respond to moral problems. Many of my questions about moral problem solving could not be addressed with existing methods for classifying moral reasoning. Jaques' Quintave Model of Cognitive Functioning provided a potential basis for classifying reasoning based purely on the structure of cognitive processes. Therefore, before conducting research on some of the questions other researchers have been unable to address about moral problem solving, an effective classification scheme needed to be developed.

The current research makes theoretical contribution both to Jaques' SST and to the cognitive-structural approach for classifying moral reasoning. The major methodological contribution is the Quintave Typology itself. Numerous possible applications of the Quintave Typology exist for future research exploring moral problem solving.

Three such possible applications of the typology were discussed. The first application involves the potential for using the typology to explore the structural dimensions of

conflict. I described several specific studies in which the typology could be applied to investigate how structural differences in types of reasoning might cause conflict.

A second possible application of the typology was identified in research examining the factors which might affect the type of reasoning an individual uses when responding to moral problems. Two such factors which could be investigated by applying the Quintave Typology were discussed. Discussion of these two applications raised additional questions about both the Quintave Typology and moral problem solving.

A final section discussed possible applications of the Quintave Typology in future research exploring implications for the concept of moral development. Specific focus was given to contrasting and reinterpreting Kohlberg's theory of moral development in light of this dissertation's findings.

Ultimately, this dissertation is the first step in developing a method for classifying the type of reasoning used when responding to moral problems. The specific research applications discussed represent only a fraction of the possible applications for such a method. Perhaps future research applying this new tool will lead to a better understanding of how different modes of reasoning affect moral problem solving. A better understanding of moral problem solving may, in turn, lead to a more moral society.

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Jaques hypothesizes the properties of set construction which define the cognitive modes as follows:

I Shaping--involves the use of existing elements without contructing new sets;

II Reflecting--involves constructing unique, discrete, primary sets;

III Extrapolating--involves constructing interactive primary sets;

IV Parallel processing--involves constructing partial secondary sets;

o one or more sequences of action, each with two or more choice points, each choice point justified with serially connected consequences and/or principles.

I	II	III	IV

- a choice of either accepting or rejecting a given action.

I	II	III	IV

o a series of related factors in a multi-step process.

I	II	III	IV

o a single factor in a one-step process.

I	II	III	IV

o a series of connected events evolving over time.

I	II	III	IV

o a label defined by one or more specific elements, or two or more specific elements defining an implied label.

I	II	III	IV

o two or more interactive sequences of action, each choice point justified with multiple interactive consequences and/or principles.

I	II	III	IV

o construction of two or more specific actions.

I	II	III	IV

o a single factor defined by one or more specific elements in a one-step process; or two or more specific elements defining an implied single factor in a one-step process.

I	II	III	IV

o one sequence of action with two or more choice points; or two or more unconnected alternative sequences of action.

I	II	III	IV

- a label without definition or specification.

I	II	III	IV

- two or more interactive sequences of action.

I	II	III	IV

o a single action justified by a single reason.

I	II	III	IV

o one or more specific actions, each justified with multiple reasons.

I	II	III	IV

- a scenario with possible connections among multiple issues and/or events.

I	II	III	IV

- probable interaction among multiple processes.

I	II	III	IV

APPENDIX B

SCENARIO I

You are a sales manager for a major computer service company. The fact that your compensation and evaluation are based on the revenue you generate each year puts tremendous pressure on you to produce short-term results.

A critical part of the process required to win a contract is to establish partnership arrangements with the hardware and software suppliers that will result in the best price/performance proposal. Typically, your company and each of the companies you select will sign an agreement spelling out the responsibilities and contractual terms of the relationship. Although this document provides the framework for the proposal development effort, it does not address every detail of the relationship. It is, however, generally recognized in the industry as a "good faith" working document.

You have been working on a project for the U.S. Customs Service for over one year. Your company and the other companies working with you have incurred significant expense in the development of your technical solution. Just before the final proposal is to be delivered, a new product is announced by Advanced Technology (AdTech) which has significantly better price/performance than the Kairos product incorporated into your current solution.

Your salesman on the account, Ben Tracey, is approached by AdTech proposing that you replace the Kairos equipment in the proposal with the AdTech equipment. The salesman believes that if you do not accept the proposal, AdTech will go with your primary competitor.

Ben Tracey presents the situation at the senior management briefing. Your attorney explains that the agreement with Kairos could "legally" be broken because of ambiguous wording submerged in one of the sections. The clause had been placed intentionally in the document to mislead Kairos into thinking it had a binding agreement.

The group president is convinced that without the change your competitor will win, and that even with the change your chances are only fifty-fifty. After considerable discussion, you are told to call Kairos and tell them that you are breaking the agreement.

You are stunned. You have developed close working relationships with a number of the Kairos people on the project. It was because of your personal commitment and assurances that Kairos undertook the project in the first place. Now, after they have made a considerable investment in time and money, you are told to break your commitment.

SCENARIO II

You are a production foreman for a small industrial manufacturer. Your job is to supervise the fabrication of a variety of custom made seals and connectors.

A huge rush order comes in for a range of special plastic seals. The specifications are extremely demanding--particularly in light of the short time frame available to produce and deliver the entire order. You discover that your marketing department has accepted stiff penalites for late delivery because the customer represents tremendous long-term opportunities.

After several weeks it becomes apparent that because of quality control rejections, the order will not be completed on time. The vice-president of marketing calls a meeting with you, your manager, the head of quality assurance, and the quality control inspector assigned to your line. The marketing V.P says that a decision has been made to ignore the specifications of the seals and that quality control was not to reject any more of the seals. Both of the quality control people agree to falsify the documentation and allow all production to be shipped in order to meet the requirements of this critical order.

Your manager tells you not to mention this situation to anyone, and if asked about it, to deny everything.

QUESTIONS

I. In your own words how would you describe the situation?

II. What caused this situation?

III. What are your alternative courses of action?

IV. What would you do? Why?

APPENDIX C

Appendix C

Scenario	Sample #	Question	Style # (1-4)				Summation	
			1	2	3	4		Match/Mis
I.	1.	A	2	0	0	0	4	
		B	2	0	0	0	4	
		C	0	2	0	0	4	
		D	0	2	0	0	4	
	2.	A	1	1	0	0	2	
		B	0	2	0	0	4	
		C	0	2	0	0	4	
		D	0	2	0	0	4	
	3.	A	0	2	0	0	4	
		B	0	0	2	0	4	
		C	0	0	2	0	4	
		D	0	0	0	2	4	
	4.	A	0	2	0	0	4	
		B	2	0	0	0	4	
		C	0	2	0	0	4	
		D	2	0	0	0	4	
	5.	A	2	0	0	0	4	
		B	2	0	0	0	4	
		C	2	0	0	0	4	
		D	2	0	0	0	4	
	6.	A	1	1	0	0	2	
		B	0	2	0	0	4	
		C	0	0	2	0	4	
		D	0	0	1	1	2	
	7.	A	0	2	0	0	4	
		B	2	0	0	0	4	
		C	0	2	0	0	4	
		D	0	1	1	0	2	
	8.	A	2	0	0	0	4	
		B	2	0	0	0	4	
		C	2	0	0	0	4	
		D	0	2	0	0	4	
			—	—	—	—	—	ma/
subtotal 1			**26**	**27**	**8**	**3**	**104**	**28/**

9.	A	1	1	0	0	2
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
10.	A	0	1	1	0	2
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	0	0	0	2	4
11.	A	0	0	2	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	1	1	0	0	2
12.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
13.	A	0	0	2	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	1	1	0	0	2
14.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	0	1	0	1	2
15.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
16.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
17.	A	2	0	0	0	4
	B	0	2	0	0	4
	C	0	1	1	0	2
	D	0	0	2	0	4
		—	—	—	—	— ma/r
subtotal 2		**48**	**13**	**8**	**3**	**130** 29/7

18.	A	0	0	0	2	4
	B	0	2	0	0	4
	C	0	0	1	1	2
	D	0	0	2	0	4
19.	A	0	1	1	0	2
	B	2	0	0	0	4
	C	0	2	0	0	4
	D	0	0	2	0	4
20.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	0	0	2	0	4
21.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	1	1	0	2
22.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	1	1	0	0	2
	D	2	0	0	0	4
23.	A	0	0	2	0	4
	B	2	0	0	0	4
	C	1	1	0	0	2
	D	0	0	0	2	4
24.	A	1	1	0	0	2
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
25.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
26.	A	1	1	0	0	2
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
		—	—	—	—	—
subtotal 3		39	17	11	5	128

Ma/M

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27.	A	0	2	0	0	4	
	B	2	0	0	0	4	
	C	0	2	0	0	4	
	D	1	1	0	0	2	
28.	A	2	0	0	0	4	
	B	2	0	0	0	4	
	C	2	0	0	0	4	
	D	2	0	0	0	4	
29.	A	2	0	0	0	4	
	B	1	1	0	0	4	
	C	0	2	0	0	4	
	D	0	0	0	2	4	
30.	A	2	0	0	0	4	
	B	2	0	0	0	4	
	C	0	2	0	0	4	
	D	0	2	0	0	4	
31.	A	0	2	0	0	4	
	B	0	0	0	2	4	
	C	0	1	1	0	2	
	D	0	2	0	0	4	
32.	A	1	1	0	0	2	
	B	1	1	0	0	2	
	C	0	0	2	0	4	
	D	0	0	2	0	4	
33.	A	0	0	0	2	4	
	B	0	0	0	2	4	
	C	0	0	0	2	4	
	D	0	0	0	2	4	
34.	A	0	2	0	0	4	
	B	1	1	0	0	2	
	C	0	2	0	0	4	
	D	0	2	0	0	4	
35.	A	0	0	0	2	4	
	B	0	0	1	1	2	
	C	0	0	0	2	4	
	D	0	0	0	2	4	
		—	—	—	—	—	Ma/M
subtotal 4		21	26	6	19	130	29/7

36.	A	1	1	0	0	2
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	0	2	0	4
37.	A	2	0	0	0	4
	B	0	2	0	0	4
	C	0	0	2	0	4
	D	0	0	2	0	4
38.	A	0	0	2	0	4
	B	0	2	0	0	4
	C	0	1	1	0	2
	D	0	2	0	0	4
39.	A	1	1	0	0	2
	B	0	2	0	0	4
	C	1	1	0	0	2
	D	0	0	2	0	4
40.	A	0	0	0	2	4
	B	0	0	0	2	4
	C	0	0	2	0	4
	D	0	0	2	0	4
41.	A	0	0	2	0	4
	B	1	1	0	0	2
	C	2	0	0	0	4
	D	2	0	0	0	4
42.	A	0	2	0	0	4
	B	0	1	0	1	2
	C	0	0	2	0	4
	D	0	2	0	0	4
43.	A	2	0	0	0	4
	B	0	1	0	1	2
	C	0	2	0	0	4
	D	0	0	2	0	4
44.	A	2	0	0	0	4
	B	0	0	0	2	4
	C	0	0	0	2	4
	D	0	0	0	2	4
		—	—	—	—	—
subtotal 5		14	24	21	12	128

Ma/M

28/8

45.	A	2	0	0	0	4	
	B	1	1	0	0	2	
	C	0	2	0	0	4	
	D	0	1	1	0	2	
46.	A	0	2	0	0	4	
	B	1	1	0	0	2	
	C	0	2	0	0	4	
	D	0	2	0	0	4	
47.	A	2	0	0	0	4	
	B	0	1	1	0	2	
	C	0	2	0	0	4	
	D	0	2	0	0	4	
48.	A	0	0	0	2	4	
	B	2	0	0	0	4	
	C	1	1	0	0	2	
	D	2	0	0	0	4	
49.	A	0	2	0	0	4	
	B	0	2	0	0	4	
	C	0	1	1	0	2	
	D	1	1	0	0	2	
50.	A	2	0	0	0	4	
	B	0	2	0	0	4	
	C	0	1	1	0	2	
	D	0	0	0	2	4	
subtotal 6		14	26	4	4	80	16/8

TOTALS:

subtotal	1	26	27	8	3	112	28/4
subtotal	2	48	13	8	3	130	29/7
subtotal	3	39	17	11	5	126	28/8
subtotal	4	21	26	6	19	130	29/7
subtotal	5	15	23	21	12	126	28/8
subtotal	6	14	26	4	4	80	16/8
		163	133	58	46	704	

II.	1.	A	2	0	0	0	4
		B	2	0	0	0	4
		C	2	0	0	0	4
		D	2	0	0	0	4
	2.	A	1	0	0	1	2
		B	0	0	2	0	4
		C	0	0	0	2	4
		D	0	1	1	0	2
	3.	A	0	2	0	0	4
		B	0	1	1	0	2
		C	1	1	0	0	2
		D	0	0	0	2	4
	4.	A	0	2	0	0	4
		B	2	0	0	0	4
		C	0	2	0	0	4
		D	0	0	2	0	4
	5.	A	1	1	0	0	2
		B	2	0	0	0	4
		C	0	2	0	0	4
		D	1	1	0	0	2
	6.	A	2	0	0	0	4
		B	2	0	0	0	4
		C	0	1	1	0	2
		D	0	0	0	2	4
	7.	A	0	2	0	0	4
		B	0	0	2	0	4
		C	0	2	0	0	4
		D	2	0	0	0	4
	8.	A	0	0	2	0	4
		B	1	1	0	0	2
		C	0	0	2	0	4
		D	0	0	2	0	4
	9.	A	1	1	0	0	2
		B	0	2	0	0	4
		C	0	2	0	0	4
		D	1	1	0	0	2
subtotal1			25	25	15	7	124

10.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	0	0	0	2	4
11.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	1	1	0	2
12.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
13.	A	0	1	1	0	2
	B	2	0	0	0	4
	C	0	2	0	0	4
	D	0	2	0	0	4
14.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	0	1	1	0	2
	D	0	0	2	0	4
15.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
16.	A	0	2	0	0	4
	B	0	0	2	0	4
	C	2	0	0	0	4
	D	0	0	2	0	4
17.	A	2	0	0	0	4
	B	0	1	1	0	2
	C	0	2	0	0	4
	D	2	0	0	0	4
18.	A	0	0	0	2	4
	B	0	0	1	1	2
	C	0	0	0	2	4
	D	0	0	1	1	2
subtotal 2		27	25	12	8	130

19.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	0	0	2	0	4
	D	0	0	0	2	4
20.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	1	1	0	0	2
	D	0	2	0	0	4
21.	A	0	0	2	0	4
	B	0	1	1	0	2
	C	0	0	2	0	4
	D	0	0	0	2	4
22.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	2	0	0	0	4
	D	2	0	0	0	4
23.	A	0	1	0	1	2
	B	0	1	1	0	2
	C	0	0	2	0	4
	D	0	0	0	2	4
24.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	1	1	0	0	2
	D	1	1	0	0	2
25.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	1	1	0	0	2
	D	2	0	0	0	4
26.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	2	0	0	4
27.	A	2	0	0	0	4
	B	2	0	0	0	4
	C	0	2	0	0	4
	D	0	2	0	0	4
subtotal 3		25	30	10	7	124

28.	A	2	0	0	0	4
	B	0	2	0	0	4
	C	2	0	0	0	4
	D	0	2	0	0	4
29.	A	0	0	2	0	4
	B	0	2	0	0	4
	C	0	0	2	0	4
	D	0	0	2	0	4
30.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	2	0	0	0	4
	D	0	0	2	0	4
31.	A	2	0	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	0	0	2	0	4
32.	A	0	2	0	0	4
	B	0	0	0	2	4
	C	0	0	0	2	4
	D	0	0	1	1	2
33.	A	0	0	1	1	2
	B	0	2	0	0	4
	C	0	0	0	2	4
	D	0	0	0	2	4
34.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	2	0	0	4
35.	A	0	0	0	2	4
	B	0	0	0	2	4
	C	0	0	0	2	4
	D	0	0	1	1	2
36.	A	0	2	0	0	4
	B	0	1	1	0	2
	C	0	0	2	0	4
	D	0	0	2	0	4
subtotal 4		10	27	18	17	132

37.	A	1	1	0	0	2
	B	0	0	0	2	4
	C	0	2	0	0	4
	D	0	0	0	2	4
38.	A	1	1	0	0	2
	B	1	0	1	0	2
	C	0	2	0	0	4
	D	1	1	0	0	2
39.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	2	0	0	0	4
	D	2	0	0	0	4
40.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	0	2	0	0	4
41.	A	0	2	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	2	0	0	0	4
42.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	2	0	0	0	4
43.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	0	2	0	0	4
	D	0	2	0	0	4
44.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	0	2	0	0	4
45.	A	2	0	0	0	4
	B	1	1	0	0	2
	C	0	2	0	0	4
	D	0	2	0	0	4
subtotal 5		19	48	1	4	130

46.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	0	0	2	0	4
47.	A	0	0	1	1	2
	B	0	2	0	0	4
	C	0	2	0	0	4
	D	1	1	0	0	2
48.	A	0	2	0	0	4
	B	2	0	0	0	4
	C	0	2	0	0	4
	D	0	1	1	0	2
49.	A	0	0	0	2	4
	B	0	1	1	0	2
	C	0	2	0	0	4
	D	0	0	0	2	4
50.	A	0	2	0	0	4
	B	0	2	0	0	4
	C	0	0	2	0	4
	D	0	0	2	0	4
subtotal 6		3	23	9	5	72

TOTALS:

subtotal	1	25	25	15	7	124
subtotal	2	27	25	12	8	130
subtotal	3	25	30	10	7	124
subtotal	4	10	27	18	17	132
subtotal	5	19	48	1	4	130
subtotal	6	3	23	9	5	72
		109	178	65	48	712

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