Applying the Model of Hierarchical Complexity[1]

Scoring Moral Narratives and Constructing Moral Development Instruments

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Applying the Model of Hierarchical Complexity to Scoring Moral Narratives and Constructing Instruments to Measure Moral Development

This workshop addresses two forms of measurement of moral developmental and a framework for evaluating specific interventions. The Hierarchical Complexity Scoring System is applied to the construction of instruments with consent of the user's preference and to the scoring of narratives. Those attending the workshop will learn about 1) the model

2) the concepts underlying the model
3) the description of the stages and their relationship to Kegan's and Kohlberg's stages
4) steps involved in universal stage transition, and 5) examples of scoring samples from interviews, illustrating adult development applied to using the Hierarchical Complexity Scoring System (HCSS) as a scoring aid.

Summary:

This workshop addresses two forms of measurement of moral developmental and a framework for evaluating specific interventions. The Hierarchical Complexity Scoring System (HCSS) is applied to the construction of instruments with consent of the user's preference and to the scoring of narratives. Scoring a narrative includes determining the steps between any two of the 14 known stages. The Model of Hierarchical Complexity provides a framework for scoring reasoning stages in any domain as well as in any cultural setting. In the adult population. This scoring is applied to not only to scoring narratives, but also of instruments. Instruments consist of five vignettes, each one representing one of the stages from order 8 to 12 (concrete, abstract, formal, systematic, and metasystematic). However, they can be constructed for lower stages as well. The scoring is based not upon the content or the subject material, but instead on the mathematical complexity of hierarchical organization of information. The participant's performance on a task of a given complexity represents the stage of developmental complexity. Also examined are how we resolve difficulties in discerning these stages, and transitions and how they can be scored with reliability and validity. Finally, we present Rasch analysis, which is a method of changing ratings of items into Rasch Scaled Scores both for the items and for the participants. The results allow for a test of relationship between obtained scaled scores and the underlying hierarchical complexity of the items. Usually the r > .9. The Rasch scores also allow for and examination of the coherence of responses instruments. Those attending the workshop will learn about 1) the model, 2) the concepts underlying the model, 3) the description of the stages and their relationship to Kegan's and Kohlberg's stages, 4) steps involved in universal stage transition, and 5) examples of scoring samples from interviews, illustrating adult development applied to using the Hierarchical Complexity Scoring System (HCSS) as a scoring aid. Workshop participants receive a copy of the scoring manual and instruction.

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Introduction

The Basis of Scoring Performance and Constructing Tasks: **The Issues**

The assessment of stage of development would seem like a straight forward task. One might look at the response to questions and place them into categories. Likewise one might construct questions to obtain responses that succeed or fail in addressing that item. But the issue is not so simple. These previous ways have led to great difficulties and endless controversies.

There are three prerequisites. First, one needs to understand the difference among experience, appearance, and reality. Second, one needs to understand the difference among Analysis, Phenomenology and Empiricism. And third and last is to understand the difference between independent and dependent variables as set forth by Aristotle and modified by Descartes into stimulus and response.

History

The following is adapted from Edger Brown (2004)Edger Brown (2004). It is important that any "stage" theory and the accompanying scoring scheme have a mathematically and logically developed basis. The Greek philosopher and scientist, Thales (640 € 546 Thales (640 - 546) of Miletus, who had knowledge of Egyptian geometry and Babylonian astronomy, is credited with founding mathematics as a deductive science, that is, organizing mathematics around demonstrating by logical arguments the correctness of one's assertions and calculations.

But if one does not understand the difference between the ideal and the real one can get into trouble. The failure of the Pythagorean school rested with its need to make its assertions absolute. How could one conduct science or have knowledge in general without the possibility that this knowledge corresponds with reality? Plato handled this problem by rejecting the correspondence account of truth. We cannot ever know the truth in its complete and pure form. Anything we can say about reality is only a likely story of the ideal truth. Here the ideal truth is the mathematical forms.

We know that an essential element of science is direct observation and interaction with the world. But, Plato set forth a very different doctrine, to the effect that knowledge cannot be derived from the senses; real knowledge only has to do with concepts. The senses only deceive us; hence we should, in acquiring knowledge, ignore sense impressions and develop reason.

 Aristotle (384€322) Aristotle (384-322), in codifying logical reasoning, set down rules of inference and recognized the importance of axioms for logic, postulates for the subject at hand, definitions of terms and the importance of giving logical arguments starting with the postulates. The model of hierarchical complexity follows in that tradition. Combining of Aristotle's precise formulation of logic with Thales' method, the main elements of modern science were then in place

The Model of Hierarchical Complexity on which scoring and problem construction is based, is a mathematical theory of the ideal. It is a perfect form as Plato would have described. It is like a circle. Once one draws it, it is no longer perfect. The lines have width, it is not perfect. If can be perfectly round.

Scientific accounts of behavior are built out of both analytical and empirical accounts of events (Commons, 2001). One problem that continually arises is what perturbations to consider as existing, or in other words, what constitutes an event. There only seems to be one necessary restriction on saying that something exists. The restriction is rather weak compared to those required by operationalism but strong with respect to intuitionism and phenomenonology. With the quantitative behavioral developmental theory that follows, we have to consider events as the basis. This notion is less restrictive than behaviorists' notions of stimuli and responses and so allows the theory to consider events that may not be clearly stimuli or responses. On the other hand, we do not want to make the mistake of Piagetians that thoughts, "schema," and verbalizations that belong to mental structures are the only causes of actions.

How do we know that something is an event? Events are potentially detectable perturbations. Perturbations are

classed as events when they achieve some potential to be observed, witnessed, and in some way distinguished from the remaining noise by two independent paths of detection. The term event is used here to include all such perturbations, both public and private. The notion of paths of detection is not deniable or reducible lest we get into an infinite regress. These paths do not require direct observation. Note also that more experiencers or more experiences do not count as more independent paths.

Potential events may be inferred as long as there are two distinct paths leading to that inference, such as the case with electrons. Electrons may be detected through a multitude of paths by which inferences as to the existence of an "electron event" can be made. One can measure the magnetic moment of a single electron moving along a path in a magnetic field, the electric charge in an electric field, or the ionizing potential in a liquid hydrogen bubble chamber. There are numerous other ways of detecting the electron.

The reason two paths are required for events is because one path alone could mean that the perturbation could serve as its own causal explanation of itself. Some perturbations are deemed as having the status of being only singly detectable by one path. For example, if someone reports that the president is talking to them, there is one path, their report. They do not have a radio, telephone or any other such device and the president is nowhere close by. One other path is necessary to confirm that the president is actually talking to them and they are not reporting a hallucination. Behaviors and causes detected from a personal experience alone have this character. Robert Stickgold (personal communication, 1999) has shown that people think that of what they think, see, and dream as "real" while thinking, seeing and dreaming. The status of events and perturbations is even more complex when activity is not potentially observable, as is with gyrations of the soul or will. These perturbations may be studied in theological and theosophical terms (Lowenthal, 1989 Lowenthal, 1989). The best we can do within science is to discuss the report of these perturbations as data to be explained or refer to these perturbations in metaphorical terms.

Behavioral constructs (such as stimuli, behaviors, or consequences) are events. In the case of a verbal report, an observer may hear it. A microphone and meter will show it. There is a difference between the appearance of a perceived event and the actual event. Perceptual activity can transform events. Illusions refer to those instances where people report the appearance of stimuli in ways that distort the physical properties of the objects or events. Let us say one was looking at a color patch and the person said, "I see the color brown." But the color brown has no unique

With the definitions of perturbations and events, it is possible to show what are the minimum conditions necessary for having a quantitative behavioral developmental theory. One needs to recognize the different ways in which we might know and understand development. The argument is very simple. There are three ways of knowing: Three Ways of Knowing about Development

With the definitions of perturbations and events, it is possible to show what are the minimum conditions necessary for having a quantitative behavioral developmental theory. One needs to recognize the different ways in which we might know and understand development. The argument is very simple. There are three ways of knowing as shown in Table 1. Knowledge is treated in a much more complex manner in philosophy. Here, the number of paths needed for detecting a perturbation is associated with the field and methodology that claims knowledge.

Table 1
Ways of Knowing

Ways of Knowing	Example of Fields Utilizing These Ways of Knowing	Number of Paths of Detections of Perturbations
1. Analytic: Proved material always true no matter what "data" or "experience" shows	Mathematics, Logic, Parts of Philosophy	No paths of detections of perturbations
2. Phenomenological: Experienced material a property of organisms and sometimes organisms interacting with environments.	Religion, Law, Art, Literature, Dance and Music	One independent path of detection. This means that if one observes an action and hypothesizes a cause, such as free will, then the putative cause may represent one path of detection. Detecting the behavior, however, does not prove that the hypothetical "causal" event is an actual event. If only one path is available, that is, if only one effect can be detected–that is the experience (and its report), there is no way to determine the cause of that experience. The experience is sometimes erroneously said to "cause itself."
3. Empirical: Resultant material from investigations moves scientific towards the truth.	Science, History	Two independent paths. An event can be said to be real in a scientific sense if and only if it is detectable by two independent paths. An independent second path for detecting the hypothesized causal event must be found.

There can be combinations such as 1 and 3, which define most of science. Problems arise with combinations of 2 with 1 (Folk Psychology of Aristotle), 2 with 3 (current mixes of experimental and phenomenonological accounts of free will such as Libet's, 1985 Libet's, 1985). These can lead to various dangerous policies and practices. That does not mean that 2 is not prized for itself. It is.

The first, we are familiar with. Copernicus (1530) showed that the sun is the center of the solar system. He used mathematics to represent the orbits of the planets. In some sense, this was the first mathematical model. Second, modern thinking about the brain and behavior began with the French philosopher René Descartes (1596-1650). According to Descartes (1637Descartes (1637), all action is a response to an event. He thereby introduced the notion of the stimulus and the response. Descartes suggested that 'animal spirits' flowing through the nerves of animals or humans served a similar function in automatic behavioral responses in man and animals or reflexes. The term 'reflex' is derived from the notion that the flow of animal spirits produced by a stimulus is somehow reflected by the brain into an outgoing flow which eventually produces some behavior. G. T. Fechner (1860 Fechner (1860) laid the basis for the application of the experimental method to psychology. His establishment of psychophysics through his publication of Elements of Psychophysics in 1860. He showed introduced the psychophysical scale and showed how to relate psychological variable to stimulus ones. This is exactly what the model of Hierarchical Complexity does. It relates stage of performance to the order of hierarchical complexity of tasks. Lastly, in the early 1960, Krantz, Luce, Suppes, and Tversky (Krantz, Luce, Suppes, and Tversky, 1971Krantz, Luce, Suppes, and Tversky, 1971); Suppes, Krantz, Luce & Tversky, 1989 Suppes, Krantz, Luce & Tversky, 1989); Luce, Krantz, Suppes, & Tversky, 1990 Luce, Krantz, Suppes, & Tversky, 1990) introduced the representational theory of measurement. It is the basis for the model of hierarchical complexity.

One major basis for this developmental theory is task analysis. The study of ideal tasks, including their instantiation in the real world, has been the basis of the branch of stimulus control called Psychophysics. Tasks are defined as sequences of contingencies, each presenting stimuli and requiring a behavior or a sequence of behaviors that must occur in some non-arbitrary fashion. Properties of tasks (usually the stimuli) are varied and responses to them measured and analyzed. In the present use of task analysis, the complexity of behaviors necessary to complete a task can be specified using the complexity definitions described next. One examines behavior with respect to the analytically known complexity of the task.

Ever since the introduction of the idea that development proceeds in discrete stages, scientists have argued over the framework for defining and analyzing such stages. Many models were presented to conceptualize development, including the mentalistic theory of Jean Piaget (1954 Piaget (1954), a pioneer in the field of developmental psychology. Though Piaget's theory did not define all stages precisely, it clearly established that there is one invariant pathway along which stage development proceeds irrespective of content or culture (Piaget, 1976 Piaget, 1976). Other developmental models followed Piaget's, and each usually focused on development within a particular domain of information. As more content-oriented models were introduced, the "theme of uniqueness of each model was increasingly dropping out" (Kohlberg, 1990Kohlberg, 1990). Because the varying informational frameworks of different domains have often concealed the common underlying process of stage development, standardization of research methods has been difficult to achieve. Nevertheless, researchers soon recognized the need for a broadly applicable model of developmental assessment that is necessary in order not only to better conceptualize the patterns and themes of development, but also to conduct comparable cross-cultural studies.

Post Piagetian Models

Pascual Leone (1972) developed the first theory that fit much of the data. It was a psychological theory of levels of human development. It is based on working memory and how that controls executive function. Pascual Leone was the first to divide Piaget's stage into two a piece, something that Piaget did not approve of at all. One of his students was Robbie Case. There are other who have followed in this tradition including but not limited to Frye and Zelazo. There are other generator theories including Halford's. It has only 4 stages and does not map at all onto Pascual Leone's. Kurt Fischer's theory is also a generator theory and is close to the Model of Hierarchal in it levels. It misses some of the postformal ones and misses the Sentential stage. It does not separate tasks characteristics from performance.

There are other metrics of complexity, mostly missing many of the stages, and have many too many assumptions and being very content bound. These include Feldman and Leeuwenberg. Simon's theory is about horizontal complexity.

Model of Hierarchical Complexity

The Model of Hierarchical Complexity (MHC) developed by Commons (Commons, Trudeau, Stein, Richards, & Krause, 1998) Commons, Trudeau, Stein, Richards, & Krause, 1998) offers a standard method of examining the universal pattern of development. This model is based on a theory of General Stage development (Commons & Richards, 1984a, 1984b Commons & Richards, 1984a, 1984b). The MHC states that all stages are hard distinct stages varying only in the degrees of hierarchical complexity. To counter the possible objection of arbitrariness in such an inclusive and uniform definition of stages, the MHC stage orders are grounded in the hierarchical complexity criteria of mathematical models (Coombs, Dawes, & Tversky, 1970 Coombs, Dawes, & Tversky, 1970), and information science (Commons & Richards, 1984a, 1984b Commons & Richards, 1984a, 1984b; Lindsay & Norman, 1977Lindsay & Norman, 1977; Commons & Rodriguez, 1990, 1993 Commons & Rodriguez, 1990, 1993). The Model of Hierarchical Complexity is not based on the assessment of domain specific information, but instead on the analysis of the complexity of the participant's attempted solution to a task of a specific complexity. That is, the participant's successful performance on a task of a given order of complexity represents the stage of development achieved by that participant. The stage score is derived from the evaluation of performances on tasks.

The MHC has a broad range of applicability. The mathematical foundation of the model makes it an excellent research tool to be used by anyone examining performance that is organized into stages. It is designed simply to assess development based on the order of complexity which the individual utilizes to organize information. The MHC offers a singular mathematical method of measuring stages in any domain because the tasks presented can contain any kind of information. The model thus allows for a standard quantitative analysis of developmental complexity in any cultural setting. Other advantages of this model include its avoidance of mentalistic or contextual explanations, as well as its use of purely quantitative principles which are universally applicable in any context. Cross-cultural developmentalists and animal developmentalists; evolutionary psychologists, organizational psychologists, and developmental political psychologists; learning theorists, perception researchers, and history of science historians; as well as educators, therapists, and anthropologists can use the MHC to quantitatively assess developmental stages.

The MHC and Skill Theory have ordered problem-solving tasks of various kinds, including:

Social perspective-taking (Commons & Rodriguez, 1990; 1993) Commons & Rodriguez, 1990; 1993)	Language stages (Commons, et. al., 2004 Commons, et. al., 2004)
Informed consent (Commons & Rodriguez, 1990, 1993 Commons & Rodriguez, 1990, 1993).	Writing (DeVos & Commons, unpublished manuscript DeVos & Commons, unpublished manuscript)
Attachment and Loss (Commons & Rodriguez, 1990, 1993 Commons, 1991; Miller & Lee, 1998) Miller & Lee, 1998)	Algebra (Commons, in preparation Commons, in preparation)
Workplace organization (Bowman, 1996a; 1996b Bowman, 1996a; 1996b)	Music (Beethoven) (Funk, 1990 Funk, 1990)
Workplace culture (Commons, Krause, Fayer, & Meaney, 1993 Commons, Krause, Fayer, & Meaney, 1993)	Physics tasks (Inhelder & Piaget, 1958 Inhelder & Piaget, 1958)
Political development (Sonnert & Commons, 1994 Sonnert & Commons, 1994)	Four Story problem (Commons, Richards & Kuhn, 1982 Commons, Richards & Kuhn, 1982; Sonnert & Commons, 1994 Kallio & Helkama, 1991)
Leadership before and after crises (Oliver, 2004 Oliver, 2004)	Balance beam and pendulum (Commons, Goodheart, & Bresette, 1995) Commons, Goodheart, & Bresette, 1995)
Honesty and Kindness (Lamborn, Fischer & Pipp, 1994) Lamborn, Fischer & Pipp, 1994)	Spirituality (Miller & Cook-Greuter, 2000 Miller & Cook-Greuter, 2000)
Relationships (Cheryl Armon, 1984a, 1984b Cheryl Armon, 1984a, 1984b)	Atheism (Nicholas Commons€Miller, in preparation Nicholas Commons-Miller, in preparation)
Good Work (Cheryl Armon, 1993 Cheryl Armon, 1993)	Animal stages (Commons and Miller, in press Commons and Miller, in press)
Good Education (Dawson, 1998 Dawson, 1998)	Contingencies of reinforcement (Commons, in preparation)
Good interpersonal (Armon, 1990 Armon, 1990)	Hominid Empathy (Commons & Wolfsont, 2002 Commons & Wolfsont, 2002)
Views of the "good life" (Armon, 1984c; Danaher, 1993; Dawson, 2000; Lam, 1994 Lam, 1994)	Hominid Tools Making (Commons & Miller 2004 Commons & Miller 2004)
Evaluative reasoning (Dawson, 1998 Dawson, 1998)	Counselor stages (Lovell, 2004 Lovell, 2004)
Epistemology (Kitchener & King, 1990 Kitchener & King, 1990; Kitchener & Fischer, 1990) Kitchener & Fischer, 1990)	Loevinger's Sentence Completion task (Cook-Greuter, 1990 Cook-Greuter, 1990)
Moral Judgment (Armon & Dawson, 1997 Armon & Dawson, 1997; Dawson, 2000 Dawson, 2000)	Informed consent (Commons, Rodriguez, Cyr, Gutheil et. al., 2006) Commons, Rodriguez, Cyr, Gutheil et. al., 2006)
	Report patient's prior crimes (Commons, Lee, Gutheil, et. al., 1995) Commons, Lee, Gutheil, et. al., 1995)
	Orienteering (Commons, in preparation Commons, in preparation)

Most of the earlier scoring schemes have not presented ways of assessing to what extent the quality of a participant's performance on a task should influence the stage score independent of the content of the participant's discussion. To remedy this problem, the MHC presents a framework that quantifies the order of hierarchical complexity of a task based on mathematical principles of how the information is organized, not what information is presented. The hierarchical complexity of a task to be solved is determined by the mathematical analysis of task demands. The order of performance on the task, or the stage, is also derived by analyzing the mathematical complexity of successful performance, not merely by observing what the participant does or says. The scores of the MHC indicate the stage achieved by the participant as indicated by his ability to successfully meet task demands of varying degrees of complexity. Results are not subjectively weighted based on the considerations of culture or the environment.

Hierarchical complexity refers to the mathematical complexity of the task presented to the participant, but not directly to the complexity of the participant's performance that will successfully complete the given task. Every task contains a multitude of subtasks (Overton, 1990 Overton, 1990). When the subtasks are carried out by the participant in a required order, the task in question is successfully completed. Therefore, the model asserts that all tasks fit in some sequence of tasks, making it possible to precisely determine the hierarchical order of task complexity. Tasks vary in complexity in two ways: either as *horizontal* (involving classical information); or as

vertical (involving hierarchical information).

Classical information describes the number of "yes-no" questions it takes to do a task. For example, if one asked a person across the room whether a penny came up heads when they flipped it, their saying "heads" would transmit 1 bit of "horizontal" information. If there were 2 pennies, one would have to ask at least two questions, one about each penny. Hence, each additional 1-bit question would add another bit. Let us say they had a four-faced top with the faces numbered 1, 2, 3, or 4. Instead of spinning it, they tossed it against a backboard as one does with dice in a game. Again, there would be 2 bits. One could ask them whether the face had an even number. If it did, one would then ask if it were a 2. *Horizontal complexity*, then, is the sum of bits required by just such tasks as this. The number of actions is 2^n.

Specifically, *hierarchical complexity* refers to the number of recursions that the co-ordinating actions must perform on a set of primary elements. Actions at a *higher order of hierarchical complexity:* a) are *defined* in terms of actions at the *next lower* order of hierarchical complexity; b) *organize* and *transform* the lower-order actions; c) produce organizations of lower-order actions that are new and *not arbitrary,* and cannot be accomplished by those lower-order actions alone. Once these conditions have been met, we say the higher-order action *co-ordinates* the actions of the next lower order. *Stage of performance* is defined as the highest-order hierarchical complexity of the task solved. Using Adey, in press Rasch (1980) analysis, Commons, Goodheart, and Dawson (1995; 1997 Commons, Goodheart, and Dawson (1995; 1997) found that hierarchical complexity of a given task predicts stage of a performance, the correlation being $r = .92$ (hierarchical complexity of the task that is completed).

The nonarbitrary organization of several lower order actions constitutes one action of a higher order of complexity. For example, completing the entire operation 3 x (4 + 1) constitutes a task requiring the distributive act. That act non-arbitrarily orders adding and multiplying to coordinate them. The distributive act is therefore one order more hierarchically complex than the acts of adding and multiplying alone and it indicates the singular proper sequence of the simpler actions. Although someone who simply adds can arrive at the same answer, people who can do both display a greater freedom of mental functioning. Therefore, the order of complexity of the task is determined through analyzing the demands of each task by breaking it down into its constituent parts. the hierarchical complexity of any complex task is thus mathematically determined The participant is scored at the stage this complexity when he successfully completes the task using the integrated approach of coordinated combination of lower order actions.

The hierarchical complexity of a task refers to the number of concatenation operations it contains. An order-three task has three concatenations operations. A task of order three operates on a task of order two and a task of order two operates on a task of order one (a simple task).

Tasks are also quantal in nature. They are either completed correctly or not completed at all. There is no intermediate state. For this reason, the General Stage Model characterizes all stages as hard and distinct. The orders of hierarchical complexity are stepped like the rings around the nucleus. Each task difficulty has an order of hierarchical complexity required to complete it correctly. Once again, since tasks of a given order of hierarchical complexity require actions of a given order of hierarchical complexity, the stage of the participant's performance is equivalent to the order of complexity of the successfully completed task. The quantal feature of tasks is thus particularly instrumental in stage assessment because the scores obtained for stages are likewise discrete.

Hierarchical complexity of actions refers to the number of recursions that the coordinating actions must perform on a set of primary elements. Like tasks, **actions at a higher order of hierarchical complexity**:

1) are defined in terms of the actions at the next lower order of hierarchical complexity;
2) organize the lower order actions;
3) produce organizations of lower order actions that are new and not arbitrary

These new actions cannot be accomplished by those lower order actions alone.

The hierarchical complexity of tasks and the actions they require to be successfully completed provide the

mathematical foundation for deriving scores for stages of reasoning. The MHC, however, does not dismiss the influences of the environment on one's reasoning stage development, it simply does not quantify contextual variables during the scoring process as do other scoring manuals which are designed to measure stages in a particular domain of information and may give more weight to the overall score if particular issues are addressed by participants, regardless of the manner in which the references are made.

Hierarchical Sequence of Tasks

The nonarbitrary organization of several lower order actions constitutes **one** action of a higher order of complexity. By repeating the organizing of lower order actions, one generates a hierarchical sequence. Each task in the sequence is one order of hierarchical complexity greater than the previous order that it organizes. A stage sequence is performance of tasks correctly on that hierarchical sequence of tasks.

Sample sequences illustrating the 3 axioms.

Let me give a sequence that meets the 3 axioms of the Model of Hierarchical complexity. 1. Higher order units or actions are defined in terms of two more lower order ones 2. The higher order ones organize the lower order ones 3. The organization is not arbitrary

Strings

Quarks

Particles -- They are defined in terms of quarks. Each one contains just 2 or more particular quarks . The strong **force holds quarks together** to form hadrons (particles), so its carrier particles are whimsically called gluons because they so tightly "glue" **quarks .**

Atoms / elements are made of particles. They all have an exact number of protons (the number of neutrons may vary). They also have an exact number of electrons. The "strong force" holds the neutrons and protons.

Simple molecules. They have exact number of atoms arranged in an exact order. Electro-weak force holds them together.

Assemblies of molecules – enzyme, proteins, or other "functional" molecules

Supposedly only biochemical molecules work here, because other macromolecules (plastic, synthetic) mostly have an arbitrary arrangement of their components/monomers
molecules that carry information DNA, RNA

Stages

The notion of stages is fundamental in the description of human, organismic, and machine evolution. Previously it has been defined in some ad hoc ways; here we describe it formally in terms of the model of hierarchical complexity. Given a collection of actions A and a participant S performing A, the ***stage of performance*** of S on A is the highest order of the actions in A completed successfully, i.e., it is

$$\text{stage}(S, \mathsf{A}) = \max \{h(\mathsf{A}) \mid \mathsf{A} \in \mathsf{A} \text{ and } \mathsf{A} \text{ completed successfully by } S\}.$$

Where
   A = an action,
   participant $S = S$ performing A
   A = is completed successfully by S
   h = measure on

Thus, the notion of stage is discontinuous, having the same gaps as the orders of hierarchical complexity. This is in agreement with previous definitions (Commons et al, 1998; Commons & Miller, 2001, Commons & Pekker, submitted).

Relationship Between Piaget and Commons Notions

There are some common elements between Piaget and Commons notions of stage and many more that are different. In both one finds:

1. Higher order actions defined in terms of lower order actions
     This forces the hierarchical nature of the relations and makes the higher order tasks include the lower ones
2. Higher order of complexity actions organize those lower order actions
     This makes them more powerful

What Commons et al have added includes:

3. Higher order of complexity actions organize those lower order actions in an non-arbitrary way
        This makes it possible for the organization to meet real world requirements, including the empirical and analytic
4. Task and performance are separated
5. All tasks have an order of hierarchical complexity
6. There is only one sequence of orders of hierarchical complexity.
     Hence, there is structure of the whole for ideal task actions
7. There are gaps between the orders of hierarchical complexity
8. Stage is most hierarchically complex task solved.
9. There are gaps in Rasch Scaled Stage of Performance
10. Performance stage is different task area to task area
     There is no structure of the whole – horizontal decaláge for performance.
     It is not inconsistency in thinking within a developmental stage.
     Decaláge is the normal modal state of affairs

What has been taken out of Piaget, Kohlberg, etc

There were a number of axioms and conditions removed

Performance develops so that a performance is at the same stage across domains and tasks except for decaláge
Stage are about human thought and action
Stages have representations as mental structures
Tasks and actions are the same because action is how tasks are made understandable (Genetic Epistemology)
There are logical structure of thought or actions posited
There are thought structures posited
The theory is mentalistic and phenomenological

Stages of Development

The MHC specifies 16 order of hierarchical complexity and their corresponding stages, showing that each of Piaget's substages, in fact, are hard stages. Commons also adds three postformal stages. The sequence is as follows: (0) computory, (1) sensory & motor, (2) circular sensory-motor, (3) sensory-motor, (4) nominal, (5) sentential, (6) preoperational, (7) primary, (8) concrete, (9) abstract, (10) formal, (11) systematic, (12) metasystematic, (13) paradigmatic, and (14) cross-paradigmatic. The first four stages (0-3) correspond to Piaget's sensorimotor stage at which infants and very young children perform. The sentential stage was added at Fischer's suggestion. Adolescents and adults can perform at any of the subsequent stages. MHC stages 4-6 correspond to Piaget's pre-operational stage; 6-8 correspond to his concrete operational stage; and 9-11 correspond to his formal operational stage. The three highest stages in the MHC are not represented in Piaget's model. Because MHC stages are conceptualized in terms of the hierarchical complexity of tasks rather than in terms of mental representations (as are Piaget's stages), the highest stage represents successful performances on the most hierarchically complex tasks rather than intellectual maturity.

Stages 0-5 normally develop during infancy and early childhood in people.

At the calculatory stage (0), machines can do simple arithmetic on 0s and 1s.
At the sensory and motor stage (1), infants may see or touch shapes, make generalized discriminations, as well as

babbling vocalizations.

At the circular sensory and motor stage (2), reaching and grasping actions occurs. These actions generate simple gestures.

At the sensory-motor stage (3), the actions become associated with vocalizations. For instance, an infant may hold up an object and make sounds while doing so.

At the nominal stage (4), first single words are formed. These words such as "cup" or "water" relate concepts to others.

At the sentential stage (5), toddlers form short sentences and phrases. The use pronouns, and say numbers and letters in order as well. Sentences might be "want water," "cup of water," etc.

At the preoperational stage (6), these sentences are organized into paragraph long utterances.

At the primary stage (7), these paragraph long utterances are organized into stories which may be matched to reality.

At the concrete stage (8), two primary stage operations may be co-ordinated. For example, children think that a deal is fair after looking at from the perspective of simple outcomes for each person who is entering the deal. Negotiations make sense but there are not social norms for setting prices or values.

At the abstract stage (9), variables, stereotypes, personalities, traits, etc are introduced. Quantification words like "everyone in my group," What would other's think?" appear. The dimensionalized qualities may be used to express preferences.

At the formal stage (10), discussions are logical and empirical support is logical brought. Words like "if ...then," "in every case, it turned out the same," "the reasons were" occur. This is the stage with univariate and linear explanations. There can be multiple outcomes however. The different outcomes are generally unrelated so they do not form systems.

Few individuals perform at stages above formal operations. More complex behaviors characterize multiple system models (Adey, in pressKallio, 1995; Adey, in pressKallio & Helkama, 1991) at the metasystematic stage. Some adults are said to develop alternative to, and perspectives on, formal operations. They use formal operations within a "higher" system of operations and transcend the limitations of formal operations. In any case, these are all ways in which these theories argue and present converging evidence that adults are using forms of reasoning that are move complex than formal operations.

At the systematic stage (11), the new concepts are referred to as 3rd order abstractions. These coordinate elements of abstract systems. Words like *bureaucratic, capitalist, functional,* and *structural* are common. The systematic stage concept, *structure*, for example, can be employed to ask whether the structure of camp helps instill the qualities we want in future citizens. The logical structure of this stage coordinates multiple aspects of two or more abstractions, as in: "relationships are built on trust and though we can't always keep them, making promises is one way we build trust, so it's generally better to make promises than not to make them." Here, the importance of trust to relationships, building trust, and the possibility that promises can be broken, are all taken into account while formulating the conclusion that promises are desirable. Each system consists of multivariate inputs or multiple relations. For example A or B causes C can be decomposed into two causal relations, A causes C or B causes C. A and B causes C is the cross product of two independent variables. Think of systems as a two or more way Anova or a regression equation with cross products and multiple inputs.

At the metasystematic stage (12), the new concepts are referred to as 1st order principles. These coordinate formal systems. Words like *autonomy, parallelism, heteronomy,* and *proportionality* are common. The metasystematic stage concept of *parallelism*, for example, can be employed to compare the structures of the military and of camp as institutions. The logical structure of this stage identifies one aspect of a principle or an axiom that coordinates several systems, as in: "contracts and promises are articulations of a unique human quality, mutual trust, which coordinates human relations." Here, contracts and promises are seen as the instantiation of a broader principle coordinating human interactions.

At the paradigmatic stage (13), people create new fields out of multiple metasystems. The objects of paradigmatic acts are metasystems. When there are metasystems that are incomplete and adding to them would create inconsistences, quite often a new paradigm is developed. Usually, the paradigm develops out of a recognition of a poorly understood phenomenon. The actions in paradigmatic thought form new paradigms from metasystems (metasystems).

Paradigmatic actions often affect fields of knowledge that appear unrelated to the original field of the thinkers. Individuals reasoning at the paradigmatic order have to see the relationship between very large and often disparate

bodies of knowledge, and co-ordinate the metasystematic metasystems. Paradigmatic action requires a tremendous degree of decentration. One has to transcend tradition and recognize one's actions as distinct and possible troubling to those in one's environment. But at the same time one has to understand that the laws of nature operate both on oneself and one's environment—a unity. This suggests that learning in one realm can be generalized to others.

At the cross-paradigmatic stage 14, paradigms and coordinated. This is the fourth postformal stage. Cross-paradigmatic actions integrate paradigms into a new field or profoundly transform an old one. A field contains more than one paradigm and cannot be reduced to a single paradigm. One might ask whether all interdisciplinary studies are therefore cross-paradigmatic? Is psycho biology cross-paradigmatic? The answer to both questions is 'no'. Such interdisciplinary studies might create new paradigms, such as psychophysics, but not new fields.

This order has not been examined in much detail because there are very few people who can solve tasks of this complexity. It may also take a certain amount of time and perspective to realize that behavior or findings were cross-paradigmatic. All that can be done at this time is to identify and analyze historical examples.

At the Meta-crossparadigmatic stage 15, Cross paradigms and reflected upon. Scoring for the Cross-paradigmatic stage is developed.   Examples of Cross Paradigms are found and analyzed.

Description of the Tables That Outline the Orders and Stages

Several tables are provided to help the reader better understand the concepts of stages as defined by the MHC. Tables 1, 8, and 9 present the definitions of stages with examples of task demands of respective complexities. Table 1 particularly explains how behavior may form classes and how stimuli may be place into classes both functionally and analytically.   This table gives examples of behaviors as they may be observed, and each stage behaviors is also broken down into substeps, showing the organizing functions of varying complexities. Table 1 is especially useful for scoring behaviors up to stage 12.

Table 7 provides examples of the kinds of vocal remarks made by various family members performing at specified stages. This table is a particularly useful tool for evaluating stages among related individuals which may be helpful in studies examining development and controlling for hereditary factors. In addition, in many developing nations families tend to play particularly important roles in lives of individuals, and increases in complexity might be particularly evident if the content of the assessment deals with topic of family. Family affairs constitute a practical source of universally relevant content that could be used to evaluate stages in any cross-cultural setting. Familiarity with table 2, therefore, is particularly useful for researchers.

Table 9 exemplifies various verbal relationships formed by vocalizations characterizing different stages. Table 8 is especially helpful since it shows some key grammatical structures associated with each stage, as well as the key phrases used by people performing at given stages. Though an in-depth mathematical analysis is necessary for an accurate assessment of stage, familiarity with Table 9 will assist the scorer in initial classification of behavior.

Tables 8 and 9 describe the orders of hierarchy and sequence of stages, respectively. That is, the table elaborates the nonarbitrary coordination process underlying MHC stages. This table explains how concepts are constructed and vocalized at each stage with increasing complexity. These table also clearly show how each subsequent discriminations is vocalized at the subsequent verbal relationship is formed. Understanding the examples provided in Tables 7 and 9 enables the researcher to classify stage based on complexity of vocalizations and the verbal relationships they form.

The new concepts formed at each stage can be viewed as "summaries" of the constructions of previous stages. Although the MHC proposes no mental model to explain this process (Halford, 1999 Halford, 1999), suggests that this summarizing or "chunking" makes advanced forms of thought possible by reducing the number of elements that must be simultaneously coordinated to produce an argument or a conceptualization at a higher order of hierarchical complexity. Interestingly, at the preoperational, abstract, and metasystematic stages of the MHC the new concepts not only coordinate or modify constructions from the previous stage, but they are also qualitatively distinct conceptual forms: representations, abstractions, and principles, respectively. The appearance of each of these conceptual forms ushers in three repeating logical forms: definitional, linear, and multi variate. Other researchers have confirmed these distinct conceptual forms and repeating logical structures (Fischer, 1980 Fischer, 1980; Fischer & Kenny 1986 Fischer & Kenny 1986; Fischer & Lazerson, 1984Fischer & Lazerson, 1984).

External Influences

Psychological, sociological, and anthropological data address why the participant's performance develops in a given manner. However, why development takes place is linked to how participants can demonstrate the stage of development. The successful completion of a task requires an ideal action of a given order of hierarchical complexity which had developed as a result of influences by psychological and sociological variables. For example, *Table 10* shows how stimulus control with or without support can change the relative difficulty of a task. The level of support during task completion, therefore, changes the scored order of performance. Other models have often used the participant's reference to an informational set as an index of stage development without considering such variable as the level of support. We believe that this approach is oversimplified. Accurate, consistent results could only be obtained when the system of evaluation is based on a universally applicable groundwork, such as the mathematical foundation of the MHC. According to the MHC, the participant's approach to a given task is quantified to produce a score for the stage of reasoning in any domain. Inferences regarding the factors influencing the performance can be made independent of obtaining the stage scores.

The Model of Hierarchical Complexity posits that individual's perceptions of the world (and the stimuli in it) are influenced by frameworks. These frameworks embody the individual's conditioning history, including cultural, educational, religious, political, and social backgrounds, among other factors. These combined frameworks are referred to as one's perspective. Perspectives differ in terms of hierarchical complexity. As the hierarchical complexity of an individuals's response to task demands increases (i.e., as complexity of performance goes up), the individual is increasingly likely to have taken many such perspectives into account (Commons & Rodriguez, 1990Commons & Rodriguez, 1990).

There are task demands that certain professions require of individuals. Although the job demands of a secretary may not exceed formal stage of complexity, those of managers or judges often require development beyond the systematic stage. Tables 15 and 16 provide examples of types of social organizations and professional settings which require development to various stages of complexity.

Conceptualizing Stages

Each of Piaget's stages is defined by a set of formal properties that constitute a *structure d'ensemble,* or a structure of the whole. This has sometimes been taken to mean that the entire knowledge system forms a single unified global structure (Fischer, 1980 Fischer, 1980). In some interpretations of stage transitions based on the notion of *structure d'ensemble,* development is characterized by abrupt global reorganizations of the knowledge system which is modeled as a single staircase. However, studies of performances on various tasks do not provide evidence for this type of a global structuring of knowledge. Instead, assessment models such as the MHC posit that several analogous structures of knowledge exist, however, they do not appear to develop in parallel. This is especially true of analogous structures in different knowledge domains (Fischer, 1980Fischer, 1980; Fischer & Kenny 1986Fischer & Kenny 1986; Fischer & Lazerson, 1984Fischer & Lazerson, 1984). In fact, there is no evidence whatsoever supporting a single, global, stepwise pattern of development. Instead, it has been argued that the cognitive system can best be conceptualized as a set of interrelated dynamic knowledge systems (Fischer, 1980; 1986; 1984 Fischer, 1980; Fischer & Kenny, 1986 Fischer & Kenny, 1986; Fischer & Lazerson,1984Fischer & Lazerson,1984; van Geert, 1991van Geert, 1991), each developing in a hierarchical manner. As discussed earlier, the MHC does not propose a direct link between mental processes and performance. However, inferences can be made about mental processes on the basis of patterns of performance, and these inferences can inform research into mental functioning when cultural and other factors influencing performance are evaluated along with the actual actions.-

Task Theory

To further elucidate the concepts involved in quantifying task demands as the basis for generating stage scores we present an overview of how tasks are constructed. Task demands increase along a continuum of complexity: from preoperational, concrete, and abstract, to formal, systematic, and metasystematic.

Series of tasks in different domains

Each task can only be correctly addressed at a given point in development. If the successful completion of the task requires a higher stage then one at which the person is performing, the scored stage will be lower than if the

task demands actions at the reasoning stage the participant has already achieved. Fischer has shown that presenting a task that is above the participant's stage of performance depressed the performance index below the actual stage for reasons related to emotional development (Fischer, 1980 Fischer, 1980; Fischer & Kenny, 1986 Fischer & Kenny, 1986; Fischer & Lazerson, 1984 Fischer & Lazerson, 1984), to be additionally discussed in section called **Stage Transition**. Therefore, using only a stage task that's too demanding may result in underscoring performance. Presenting a task demanding the response that the participant can actually display is a more accurate method of assessment. At the outset of the study, this stage is hard to predict. The most efficient way to assess stage, therefore, is to administer several tasks of varying complexity for the participant to attempt, including tasks of low orders of complexity. The completed task of the highest order of hierarchical complexity of all the tasks presented would most accurately represent the actual stage of the participants' reasoning. In other words, the Model of Hierarchical Complexity not only does not focus on any particular domain of knowledge for reasoning stage assessment, but it also recommends that several tasks from multiple domains are presented in order to obtain the most accurate results. The stage scores may differ in each domain depending upon the mathematical complexity of performance.

Dimensions of tasks

Tasks are comprised of three basic dimensions: action, description or reflection upon that action (King & Kitchener, 1989 King & et al., 1989; Tappan, 1990 Tappan, 1990), and the number of element that a person can work with at a given time which are required to perform that action and to report on it. The theory underlying the development of tasks is that different tasks require different levels or values of each of the three dimensions. The values of each dimension are important in assessing the stage at which a person is able to successfully execute a task. Often, these three dimensions are ignored and only one measurement, stage of action, is specified. This oversimplified process does not yield comparable measures of stage across tasks because the scoring is based on different values in one or more of the other three dimensions. In other words, the action demands of executing a certain task in one domain may differ from the action demands of executing a task in another domain. The same would be true for the demands of reflection required in performing a task in one domain versus another; and for the amount of memory required to execute a task in one domain versus another. The MHC is primarily concerned with the first dimension of task, the action dimension, because it interprets the stage of reasoning to correspond other stage of performance. However, the stages may differ in different domains because task demands also differ.

In making comparable stage interpretations across tasks, each of the values in the dimensions of action, reflection and memory should be specified. In other words, when discussing stage one must be specific about the reference to the dimensions of action, reflection, and memory.

I. Dimension 1: Action

The dimension of action consists of a number of requirements for a series of concatenated actions to form a stage hierarchy of actions. The chain of steps may not be rearranged. If doing the action was at the sensory motor stage[1], reporting on the action would be at the nominal stage, reporting on why one chooses that particular action would be at preoperational stage, and justifying those justifications would be at the primary stage. That is, more complex tasks and actions coordinate lower order tasks and actions in a nonarbitrary fashion, yielding the process to quantitative analysis.

For example, children might be told to put their toys into the toy box. Putting toys into the toy box is an action that a sensory motor child might perform. At the nominal stage they might say "toys," or at the sentential "Put toys away." Preoperational children might say, "We are putting the toys away and we can get some cookies." Primary operational children might justify putting the toys away by saying, "We must put the toys away now before we do the next thing because that is the rules."

The order of hierarchical complexity of tasks composed of subtasks is easily determined. When the tasks are from the same domain, if one task operates on the other, the order of complexity increases. The same is true across domains. When tasks from different domains are added to one another to form a new task, the number of required concatenations of actions also add. This assumes that stage requirements form an interval scale. The order of hierarchical complexity required by a task is written as o. Hence, for stage:

o = the order n requirements - order n - 1 requirements where the order n requirements is the order of hierarchal complexity required by the task.
  Hence for stage:

Stage n requirements - stage n - 1 requirements = the same as stage n - k - stage n - k - 1

The predicted stage required by a task is written as o.

o = order n - k - order n - k - 1

k is a free parameter different from k. Let us say k = 2, than order n - 2 - order n - 2 - 1 = order n -2 - order n - 3 = n -1. The order next down, is always the one that is getting organized by the stage itself

This assumption also holds for describing action and reflecting upon the description.

Dimension 2: Reflection

The dimension of reflection on action consists of the following steps:
1. Doing the action
2. Reporting on doing the action (shadowing)
3. Reporting on why one chooses that particular action
4. Reporting on why that justification is good
5. Reporting on why that system of justifications is good

Each step requires the previous step. The question is whether the fact that each step requires a previous step represents a change of stage.

Dimension 3: Memory

Remembering an action in order to reflect upon it requires non-structural actions that increase the task difficulty. Little children can describe what they are doing before they can describe what they have done earlier (Piaget, 1976 Piaget, 1976; Karmiloff-Smith, 1986 Karmiloff-Smith, 1986Karmiloff-Smith, 1986) although their exact report of what they have done may differ from what they actually did. Karmiloff-Smith clearly explains that there are mechanisms of thought in operation before the child comes to be able to report on those actions. Recalling previous actions may or may not require an extra stage depending on how the recall is triggered. For example, if the recall is in the sensory-motor stage as is the remembering of a comfortable sleeping position in order to attain that level of comfort again, one stage is not required to solve the problem, one simply moves around until that position is again attained. Yet, the *explanation* of what that position is requires additional stages. If the recall depends upon having a sense of time (i.e., recalling something ordered by time) it might require the attainment of at least one stage of development.

A given developmental stage represents a measure of successful performance on tasks of the same order of hierarchical complexity. The General Stage Model (Commons & Richards, 1984a, 1984b Commons & Richards, 1984a, 1984b; Commons & Rodriguez, 1990; Commons & Rodriguez, 1990; Commons & Rodriguez, 1993 Commons & Rodriguez, 1993) defines the *stage* in terms of task performance. When people successfully perform tasks of a given order of hierarchical complexity, they are performing at the stage of the equivalent order. However, the dimensions of reflection and memory also influence the performance or action and are shaped by the developmental environment of the individual. The MHC incorporates ideas about how task performance develops and how transition progresses from one stage to the next.

Dimension 4 Familiarity

Task can vary in their important both between different cultures and within cultures. Individuals may have more interest or training in certain tasks. Familiarly affects the difficulty of tasks. With practice, support and reinforcement, the effects of Familiarly maybe wiped out.

Dimension 5 Placement of Key Information within Tasks

Information place at the beginning or end of tasks are more easily remember and sometimes seen.

Dimension 6 Degree of Symbolization Provided

Surprisingly, mathematical problems are the easiest in educated populations because they come in a compact symbolized form. That form requires a minimum of coding by the participants

Dimension 7 Level of Support

Expanding upon Vygotsky's (1966a, 1966b Vygotsky's (1966a, 1966b) notion of scaffolding, we introduce seven values of stimulus control (*Dimension 3*). Think of these as levels of independence of control by stimuli autonomy in responding to stimuli. Each level changes the relative difficulty of a task. Level of support or demand given during problem solving derived from Arlin (1975, 1984 Arlin (1975, 1984), Fischer (1984 Fischer et al. (1984), Gewirtz (1969b Gewirtz (1969), and Vygotsky (1966a; 1966b Vygotsky (1962; 1966). The name of support is stated and how it changes the measured order of performance relative to unaided problem solving. Then the action with respect to the participant is stated.

Stage Transition

Measuring transition is extremely important. Many interventions do not produce a change of a complete stage. Some population only vary between transition-to-the-next stage and the next stage such as professors at research universities who study ethics.

There are two forms of stage transition. One is transition steps. These steps represent how two lower stage behaviors alternate increasingly rapidly. At step -1 or 4, the same stage behavior there is no alternation. The rate of alternation is 0. Then at step 0, which is getting off the dime when the present stage is seen to fail, to using an alternative same stage action, to alternating such an action with the previously more used action to finally smashing elements of both previous stage actions together – an infinitely fast alternation rate. See Tables 10 and 11.

The second form of transition if the proportion of current and next stage action as Theo Dawson shows using Rasch analysis. If one looks at where the person scores fall, they fall between the stage marked by item those two stages or scores for those two stages.

In order to understand how the dimension of performance increases in hierarchical complexity we must examine the factors implicated in driving stage transition. That is, we must examine the various contingencies that promote the development of performance at higher reasoning stages which is only possible when the dimensions of reflection and memory coordinately increase in complexity along with the dimension of action. There are a large number of such contingencies. They include but are not limited to providing reinforcement or support for next stage behavior, showing contradiction for present stage behavior, exposing people to models of next stage behavior and the reinforcement that such behaviors attain. Here we also consider emotional and various environmental factors that shape the individual's transition from one stage to the next.

Every participant's behavior could be categorized to a transition step between stages. Varying factors such as the impact of emotions, personality, and environment, etc influence how long someone may stay at each step-. Most people only traverse up to 12 stages by the age of 24. Evidence shows people may transition every two years at most, sometimes even less. The only time when fast transitions occur is perhaps during infancy. Again, the participant's performance on a task can only be scored at a given stage of complexity when the task of a corresponding order of complexity is successfully completed. Table 7, for example, focuses on four types of personalities associated with various transition substeps. Adults are simply not meant to "get stuck" at these substeps, and the examples provided are often associated with psychological or personality disorders. This knowledge of transitional mechanisms underlying development is a great asset for therapists and psychiatrists to possess because it could be so useful in diagnosing patients. Because reinforcement moves people along the substeps toward the successful achievement of stage, using various modifiers of reinforcement would help clinicians treat patients. The crucial insights of the MHC, therefore, are clearly applicable not only in research, but in medical practice as well.

When one successfully completes a task of a given order of hierarchical complexity, one is performing at that stage of complexity. Therefore, static coping is what occurs when one is not required to perform above one's characteristic stage of performance. Often one must meet or solve other problems successfully, or assume additional perspectives and skills in order to change stages. In those cases, dynamic coping occurs during stage transition and it involves several steps. During steps 0-2, deconstruction of previous stage behavior occurs (e.g. Swan & Benack, 2002 Swan & Benack, 2002), during steps 3-4, new stage behavior is constructed.

At the beginning of each transition the perceived rate of reinforcement drops. The more one confronts failure, the more one might expect avoidance. In fact, Commons, Grotzer, and Davidson (in preparation Commons, Grotzer, and Davidson (in preparation) found that feedback alone in higher stage tasks led to a decrease in stage of

performance, rather than an increase. Perhaps its defensive behavior, with is fear accompanying transition through the steps, decreases the stage of performance. Another explanation could be that one does not see a stage of performance higher than one's own in others and this impedes learning through support. Please refer to Table 5 which elaborates the role of support in stage change. In any case, it is important to note that emotions are usually associated with transition of stages.

Transition Steps

At step 1, the demands for performance beyond the final step of the last stage are perceived. Without changing performance from step 4 of the previous stage, there is a perceived reduction of reinforcement for task performance. This characterizes step 1. A person feels stupid and upset, sometimes even angry, while failing to fulfil a task. One may also feel elated about task mastery of the previous stages tasks.

At step 2, the person feels dejection in addition to the previous feeling of sadness (or anger). In both of these first transitional steps, one may want to "give it all up" and forget about it all. These are defense mechanists, ways of switching the point and rejecting frustration.

At step 3, relativism becomes the key concept. One sees the possibility of solving a problem but does not necessarily know the right means of doing it. Someone can be seen as competent for a special task, but not to any task. Relativism has to do with contexts, and because contextualization is a sort of concretizing, it is an attempt to cope with each better way. But concretizing is not the same as coordinating. One just knows there is a way of comparing situations and means, but not how to do so. Keep in mind that actions of the full higher order of hierarchal complexity not only put together actions of the lower order, but organize them in a non-arbitrary fashion. Random contextualization, therefore, is characteristic of a transitional step from one stage of performance to another.

Table 6a explains the steps involved in stage deconstruction, also providing the logical scheme underlying this process. The substeps organizing each deconstruction step are provided in dialectical form, even though the organization is based on mathematical laws. The construction of each step out of substeps is written out to facilitate the readers's understanding of the very mathematical notions involved in organizing complexity.

At this point during transition, between the deconstruction and construction steps, one may feel conflicted, anxious and not sure of anything, because the individual does not perceive any control over the situation. People may ask themselves whether they are independent or dependent, but they most likely can not find an answer. Who is the one that really holds the reins? One might enjoy the excitement of the uncertainty, such as s tourist feels upon visiting a strange land and experiencing other cultures for the first time. One might defend the relativism as a necessary reality and feel that it justifies one's behavior.

At step 4, the first step in constructing new stage behavior, people begin to show more creativity in handling problems. There are several conditioning substeps comprising this step:

5, a) The first substep is described as "getting chaotic". One simply tries anything to get going. What is often done is just smashing (or lumping) of all the existing systems of acting together without any formal integration. Smashing has an aggressive and desperate tone characterizing attempts to "survive"– i.e. building a life raft out of anything. On the first substep, people feel somewhat manic as part of a normal process.

6, b) The second substep is the "learning what to do" substep. Templates are formed that are inclusive. The instance of the relationship at the target stage will be detected and used. This second substep brings with it a beginning in producing correct results. One is not able to eliminate those acts that do not bring good solutions, but the right direction is at hand. The most common feelings experienced at this point are excitement and a sense of frustration because of making errors.

7, c) The third conditioning substep is "learning when and where to do" each subset of action. People know what to do but not when to do it. They may feel uncomfortable and confused, but not helpless. One knows what to do, but not when. On the other hand, people who do not know what to do, may have a feeling of deep incompetence and helplessness. When people feel both confused and helpless, they have no sense of power nor the ability to act progressively. One learns to eliminate over generalization errors. Everything has to be compulsively cleaned up. One may be obsessive, fussy, and "sticking." Templates constructed here exclude rather than include. There is reconstruction. One is just not meant to get stuck here.

During the final step 4 which completes the construction of new stage behavior, inclusion and exclusion templates are finally coordinated. One feels glorious for combining right elements successfully. A post-reinforcement pause may follow. At this step the closure makes one feel personally satisfied. As Rosenberg (1979 Rosenberg points out, how this momentary stability is perceived will effect how one feels socially (Rosenberg, 1979 Rosenberg, 1979). Quite often the demands for further development occur. This affects how long such positive feeling persist.

Table 3
When entering a score into an analysis, we use the following:

Order/Stage Name	Order/Stage Number
Computational	0
Sensory or Motor	1
Circular Sensory Motor	2
Sensory-Motor	3
Nominal	4
Sentential	5
Preoperational	6
Primary	7
Concrete	8
Abstract	9
Formal	10
Systematic	11
Metasystematic	12
Paradigmatic	13
Crossparadigmatic	14
Meta-Crossparadigmatic	15

To the previous stage, we add the following for the transition steps.
Table 4
Transition Steps

	Step		Points
Failure	0	1	0.2
Complementation	1	2	0.4
Alternation	2	3	0.6
Entering Smash	3	4	0.8
Hits and False Alarms	4	5	1
Correct Rejections and Misses	5	6	
Full Coordination	6	7	

For example, a performance transitional to metasystematic at step 2 would be 11- 2 or 11.6 points. Performing fully at the Metasystematic stage is therefore 11-4 or 12 = 11 + 1 points

Table 11 explains the deconstruction steps, also elaborating the logical scheme involved. Like in Table 12, the substeps are clearly written out to clarify the mathematical principles of organization. Transition may be similar to fractals in nature (Ross, 2007 Ross, 2007). The same steps are repeat over and over, exactly once per stage.

Reinforcement moves everyone along the substeps according the melioration law (Herrnstein, 1982Herrnstein, 1982, Herrnstein & Vaughan, 1980Herrnstein & Vaughan, 1980), which dictates that behavior progresses at a rate

proportional to an increase in reinforcement. Increases in hits increase the likelihood of making hits, which reinforces the generalization. Decreases in over generalization also increase reinforcement. This law also explains how and why the lack of satisfaction reinforcement that occurs when tasks are completed which are below the actual stage of the individual-- underestimate the stage since the individual may actually perform at a lower stage due to the lack of such reinforcement. Indeed, as explained in Table 13, emotional states and personality types affect stage transition, and this factor must be considered when formulating a complete conception of the processes involved in stage development.

Knowing how stage transition occurs is important in the proper application of the quantitative methods of the MHC. Since stage is assessed from performance, the best performance must be elicited properly. The failure of the researchers to administer the tasks so as to provide an adequate environment for the expression of ability may result in underscoring stage. Therefore, researchers must understand the psychological and sociological variables not only of how performance on tasks develops, but also how it can be demonstrated during assessment procedures.

How to Measure Transition

Transition can be measured using four different methods:

1. Scoring interviews directly for statements that reflect transition
2. Finding the rate and acceleration of alternations of old stage and newer stage actions.
3. Finding the proportion of new stage versus old stage behavior.
4. Determining the hierarchical complexity of stimulus items (or tasks) and using a Rasch analysis to show that they form a continuous scale. The Rasch analysis scales performance and items on the same log linear line. Transitional performance is shown by the mixtures of performances at different stages. The mixtures range from 0% at the higher stage to 100%. We call 95% at a stage consolidated performance and 0% up to 95% transitional. The advantages of the Rasch analysis are that: a) it reduces measurement variance to a minimum; b) This yields direct comparability which is useful in assessing both the possible natural number and nature of the items and the corresponding performances (Mislevy & Wilson, 1996Mislevy & Wilson, 1996; Wilson, 1989Wilson, 1989).

Acquisition of New Stage Behavior

To overcome the huge gap between the lower stage behavior and the higher-stage behavior, Piaget suggested two processes: assimilation of new behaviors and performances to the present stage; accommodation to the higher stage performance. In both cases, we argue that the laws of learning apply. Different forms of instruction produce both assimilation and accommodation. The general finding is the more solid the performance at the lower stage behaviors, the more easily the new stage behavior may be acquired.

We describe five ways of advancing stage change as discussed with respect to adult development. First is the didactic method of teaching about higher stage behaviors. Second is the Piagetian notion of immersion and the use of contradictions. There are a wide range of programs and variation on this theme (See Adey, 2001 Adey, 2001; Brendel, Kolbert, & Foster, 2002 Brendel, Kolbert, & Foster, 2002; Lovell, this issue Lovell, 1999; McAuliffe, 2002 McAuliffe, 2002). Third is the use of reinforcement for correct answers and outcomes. Fourth is the use of support. Last is the use of direct instruction and charted performance as feedback.

Didactic teaching has many variants. The most common is show and tell. At the high school level and above, this is referred to as lectures. Lecturers seem to have been derived in form from sermons. The information is imparted by speaking to the multitude. Seeing films or videos, DVD's or other electronic form of one-way media including seeing films, or listening to tapes, are all variants. Sometimes there is a lecture followed by a discussion section, which may include more detailed lectures with some possibility for questions.

A second and related form to lectures is reading material. Not surprisingly, it is more effective. It allows for self-pacing, reviewing, and highlighting. Reading is a much more active process. The order from least active to most active is as follows: show and tell, listening, and reading.

Whereas the Piagetian notion of immersion works well for children and adults who care about contradictions in academic settings, less motivated children do not change stage very readily under these conditions (Commons & Miller, 1998 Commons & Miller, 1998). In one experiment, performing the correct task lets the children earn points. The children's points are then pooled for different teams and then the teams are put into competition

between each other. These competitions for points led 75% of fifth and six grade students to acquire formal operations on a number of Piagetian tasks.

 Fischer (personal communication   Fischer (personal communication) reports that various forms of support– providing examples or prompts for what is the correct response--leads to the acceleration of the acquisition of new stage behavior. This is probably due to the fact that such types of support reduce the required task demands by one order of hierarchical complexity (see Table 5). This makes it possible to perform the higher stage task. Repeated performances at the higher stage are reinforced and therefore acquired.

Finally, fields such as Precision Teaching offer actual training of new actions. Two basic notions in Precision Teaching are elements (components) and compounds (combinations) of those element behaviors. Precision Teachers first train individuals on the elements or components, and only later on combining them. In Precision Teaching one makes decisions about the effectiveness of current instructional interactions based on charted performances. The chart shows the rate of completing tasks and compares the rates to how experts would perform. Fluency training on the element behaviors consists of getting those behaviors to occur at an extremely rapid rate. When the rate of behavior reaches a maximum, that is, it most closely matches the rate of an expert –the behavior is considered fluent. If it is learned to the extent that very little effort or special attention is required, that is, the performance is automatic. Fluency training on the elements seems to increase the speed at which compounds are acquired from elements. The implications of this work are that Precision Teaching in behavior analysis provides an empirical account of development.

The Upper Limits of Stage Transition

The discussion of stage transition may give the impression that under ideal conditions no factors in the stage transition theory necessitate an upper limit on stage. The current formulation of stages includes 16 orders of complexity, suggesting that the number of times a series of elements can be turned into a higher order combination is 16. This may, in fact, be the upper limit, at least for human beings. There have been an increasing number of empirical reports claiming that a limit exists on the number of times a series of elements can be turned into a combination. These reports can be found in training studies, which show that at a given age, there are limits to how much training is effective in bringing about change. We also know from training graduate students that no matter how much training one provides for this group, some students will never move beyond the systematic stage in their problem solving because of getting stuck somewhere in the transition, not because of an inadequate testing environment.

It is also suggested that whatever the upper limit may be for a particular individual, that ceiling is almost totally heritable. For example, there does not seem to be any variation among identical twins who have been provided with similar training. Providing additional training to both twins merely causes acceleration of transition in the slower twin, but only up to the limit achieved by the other twin, not beyond.

This theory of stage transition makes six predictions regarding the stages, all of which (Dawson-Tunik, Commons, Wilson, & Fischer, 2005;Dawson-Tunik, Commons, Wilson, & Fischer, 2005; Dawson, Commons, & Wilson, 1999, JuneDawson et al., 1999, June) have confirmed:
1.   There is very good sequentiality.
1.   There is only a little mixing of stage items.
2.   There are gaps in difficulty between stages. A Saltus model (Wilson, 1989 Wilson, 1989) shows that there is no continuity between the stage items.
3.   People generally perform in a uniform manner within a domain regardless of the domain. Most performances are predominantly at a single stage.
4.   The distribution of person's performance within each transition is strongly skewed toward the higher stage. Comparatively few people exhibit only a little reasoning at their highest stage. For example (Dawson & Commons, in preparation Dawson & Commons, in preparation), there are fewer participants performing in transition on Kohlberg's Heinz and Joe dilemmas and more who perform at lower consolidated stages. Whether a participant's performance was in transition was measured psychometrically by the proportion of new stage versus old stage behavior.

The Model of Hierarchical Complexity allows an explanation for performance and behavior that may apparently be "stuck" between stages. Stages of performance are, indeed, hard, and distinct, as the MHC dictates; however, understanding the steps involved in transition between stages, and the influences of emotional states on the

participant's actions as well as on other dimensions of performance on tasks allows for a more complete understanding of stages. The higher the stage, the more complex the behavior it requires, therefore, at higher stages, transition behavior is more likely to be observed than at lower stages which require simpler behavioral patterns.

The mathematical foundation of the MHC also presents a more concrete framework for assessing development that can be used to make cross-cultural studies and comparisons in order to elaborate the factors involved in human development. However, it is also necessary to thoughtfully construct the format of presenting the tasks to the participants, because the format may have additional effects on performance.

Table 1 in Tuladhar & Commons (In press) shows the correspondence between some life-span stage theory developmental sequences of stages and levels. It is based on the stages of the Model of Hierarchical Complexity (MHC) and the corresponding stages of Fischer and Bidell (1998), Piaget and Inhelder (1969), Colby and Kohlberg's (1987a, 1987b) 9 point scale and 13 point scale and their respective Moral Maturity Scores (MMS). MMS was described by Colby et al. (1983) as a measure of the Moral Judgment stages. The score is a continuous variable representing the proportion of moral reasoning done by individuals at each stage of Kohlberg multiplied by the ordinal number of that stage. For example, an MMS of 200 indicates that all of the individual's reasoning is at stage 2 of the 9 and 13 Point Scales of Moral Judgment and an MMS of 300 indicates that all of the individual's reasoning is at stage 3 of the 9 and 13 Point Scales of Moral Judgment. However, in Tuladhar & Commons (In press), the distribution of the MMS to the stages of Kohlberg and descendants has been adjusted. The stages of Fischer and Bidell and Piaget & Inhelder corresponding to the Orders of Hierarchical Complexity were adapted from the conversion tables provided by Commons, Trudeau, Stein, Richards & Krause (1998) and Dawson-Tunik, Commons, Wilson, & Fischer, (2005). The conversion of Kohlberg and decedents' 9 Point Scale of Moral Judgment and 13 Point Scale of Moral Judgment into the Orders of Hierarchical Complexity (OHC) was made on the basis of the following three assumptions.

1. Model of Hierarchical Complexity is model that measures development and shows sequence of actions for a task. There has been a lot of empirical evidence that substantiate not only the face validity of this model but the extremely high predictions of Rasch Scaled performance from the Orders of Hierarchal Complexity of tasks – up to $r = .984$.

2. 50 point rule: The Moral Maturity Scores (MMS) of each Order of Hierarchical Complexity are 50 scores apart. For example, an MMS of 100 indicates that an individual is performing at stage 5. An MMS of 150 indicates that an individual is performing at stage 6. An MMS of 200 indicates that an individual is performing at stage7 and so on. Hence, as Orders of Hierarchical Complexity increase by 1, the corresponding MMS score increases by 50 points. As Pascual-Leone (1972) showed, all the half stages of Piaget and therefore of Kohlberg are really full stages. Thus, each half stage of Kohlberg would be 50 MMS apart.

3. The Model of Hierarchical Complexity (MHC) applies to Inhelder and Piagetian (1958) theory of stage that two or more lower order actions constitutes one action of a higher order of complexity. Those actions have to be coordinated. However, MHC also adds that the ordering of the lower order actions should be non-arbitrary. See the Table in Tuladhar & Commons (In press). Correspondence between some life-span stage theory developmental sequences of stages and levels. *Journal of Adult Development*.

Steps to Scoring Interviews Using the Model of Hierarchical Complexity

The Hierarchical Complexity Scoring System (HCSS) entails several steps for assessing performance on a task:

1 Transcribe the interview or the material and put it onto a disk in a file. The file should be continuous. There should be a participant number, age and sex. The interview should be recorded verbatim. The analysis follows the interview. It is done systematically.

2. Divide the interview into individual statements about an issue in a domain. In an interview, each statement is numbered. These are usually propositions. Number the propositions $a_1, a_2, a_3, ... a_k$ etc.

3. The individual statements are coordinated to build bigger statements. For example, two abstract stage statements, a_1, a_2, may be coordinated to form one formal operational statement, f_1. Two or more formal operational statements, f_1, f_2. may be coordinated into a system, s_1. Two or more systems, s_1, s_2, may be coordinated into a metasystem, m_1. Hence, the beginning statements may appear low in stage. The overall statement that is being scored usually ends with the highest stage coordination. The overall concluding

statement is used to determine overall complexity for a number of reasons:
a. The mixture of lower order items distort the score of a statement or action.
b. All higher order statements require such lower order substatement.
c. Hence, scores the most integrative statement or action because it is the only consistent way to score
Sometimes the last coordination comes when the participant is asked why something is not true, caring, fair, beautiful, important, etc. The overall statement is the series of sub-statements the ends with the highest stage coordination.

4. Statements are classified as scorable or unscorable. A scorable statement consisted of the assertion of a solution to what the participant perceived as a problem (often an interview question) and the justification for that assertion. Statements are considered unscorable if no justifications were given regardless of whether solutions were asserted.

5. Scorable statements contain either positive or negative assertions. An assertion was a *positive* if it affirmed some position or relationship. A assertion was a *negative* if it denied or rejected a position or relationship.

6. To determine the category in choice theory (hit, miss, correct rejection, or false alarm) into which a answer falls the correct and incorrect information is combined with the positive and negative assertions.

7. To determine whether the statement's conclusion is correct or incorrect for the stage of reasoning the participant used to make the conclusion,

   a. the hierarchical complexity of the implicit task a participant is trying to perform was systematically abstracted;
   b. the most complex task attempted in a statement was identified;
   c. the participant's argumentation was compared with the criteria for the stage.

8. Whether an assertion resulted from successful or unsuccessful reasoning was distinguished in two ways, depending on whether the assertion was positive or negative. A *positive* assertion which affirmed a conclusion that is correct for the stage of reasoning it used was called a *hit*. If the conclusion was incorrect, by the criteria of the stage, the positive assertion was labeled a *false alarm*. A *negative* assertion which correctly rejected a conclusion that is false for the stage of reasoning used was a *correct rejection*. And if the conclusion was incorrectly rejected, by the criteria of the stage, it was called a *miss*.

9. The last step is to calculate an index of sensitivity and a Rasch estimate of both item (score given to a statement) difficulty and participant proclivity. These are related to the given order of hierarchical complexity of the item. The nominal traditional categories of domain, issue, and norm are also recorded.

Problems with Other Forms of Scoring

I. Scoring manuals have been domain specific for the most part.   Colby and Kohlberg's (1987) Colby and Kohlberg's (1987a, 1987b) scoring system is reliable only for those dilemmas contained in the scoring manual. The *Washington Sentence Completion Test* (WSCT) scoring system is reliable only for those sentence stems contained in the scoring manual. This restriction follows from the fact that the logic of interstage relationships has not been made explicit.

   a. bootstrapping method of developing the scoring system
   b. manuals generated by applying a particular stage theory to pilot data
   c. manual consists of standard dilemmas with representative answers for each stage
   d. criterion judgments for each issue in the argument are reviewed, and matched to participants' responses
   e. the matching process requires scorer to be familiar with the manual and to make fine discriminations between arguments
   f. matches are ultimately based on the particular conceptual content of elements employed by the participant, rather than upon the relations among these elements. Standard Issue Scoring is thus limited by being content bound.

Concatenation: In a concatenation, a coordinating action is performed on two or more elements. The products of

this action then become the elements and the action is performed again on the new elements. The products of the second performance of the action are taken as elements and the action is performed again. In theory, such a concatenation may be extended indefinitely.

Domain: Domain describes a set of tasks that share certain qualities in common. Such tasks are similar in both their actions and the objects acted upon (content).

Downward assimilation: Participants sometimes give answers or solutions that are derived from a higher orders of reasoning than the one the participant uses to justify the answer. This suggests that people may be attracted to the arguments of a given stage even if they themselves are unable to generate them. The adoption of such arguments is downward assimilation. For example, there is a social domain

Interview instrument: An interview instrument is a construction such as the Heinz Dilemma. It presents a framework around which the interview can be directed.

Order of Hierarchical Complexity of Performance: A Participant's stage of performance is the order of hierarchical complexity of a successfully performed task.

Variable: A variable is defined as an element with more than one possible solution (value). Variables can be continuous (like size) or discrete (like age in years). Discrete variables can be binary (dichotomous), like clean/dirty or new/old, or they can be multivalent, like number of dependents.

In assessing development there is always the question as to whether the tasks should be presented to participant as a series of problems or in an interview format. In either case, the task may be used to examine various issues, such as moral reasoning, social-perspective taking, attachment, causality detection, etc. The participant may deal with each issue at a different stage, depending on the order of the performance on the task connected to each issue. When the three task dimensions earlier described are uniformly taken into account, both types of the assessment instruments, the interview and problem set, yield equivalent stage results because stage is a single measure of the hierarchical complexity of the task that the participant is solving. As long as the task demands presented in an interview or in a problem set are the same, performance stage should not vary. Though the format of the task can possibly add demands not related to stage of performance, the stage scores remain unchanged because the task related to stage is what must be correctly completed. Like all answers during an interview solve some implied task, all solutions to a problem series solve an issue at a stage of a particular hierarchical complexity (Commons,

Kantrowitz and Buhlman, 1984Commons, Kantrowitz, et al., 1984).[2]

Once a task has been constructed and administered, the scoring scheme specifies the relevant data that the researcher evaluates to produce a stage score. Since most scoring schemes use standard assessment tools, the implied tasks that the participant carries out at a given stage are clear to the researcher. Once the implied tasks for each stage are uncovered from analyzing participants' responses, a direct problem with more categorical answers is constructed.

Interview answers are relatively less constrained than stimulus driven problems. Problems and dilemmas always have specific contexts and ways of assessing performances. Because interview answers are much less constrained, one would expect that the plausible responses are essentially infinite. The validly of the answers may be great because the probability of selecting a non-self-representative response is virtually nil. On the other hand, dilemma presentation risks missing the responses that a participant would choose if less constrained by the instrument of assessment. Hence, we suggest that both dilemma and response sets are used as measurement tools during the evaluations. In some cultures, on the spot social discussions may also prove useful and necessary. Keep in mind, that presenting a variety of tasks of varying orders of complexity comprise the most efficient method of accurately assessing stage.

The two forms of measurement are mirrors of one another. With fixed problems, one can study the processes of transition and acquisition of new stage behaviors, as well as the specific ways in which problems are solved. Small variations may be introduced into the fixed problems administered to the participants, by varying single aspects of interest each time an assessment tool is used.

In addition, though this involves a considerable effort, researchers can turn the interview responses into problems. The main difficulty lies in delineating the implied tasks and in showing how the actions that are needed to carry out a desired sequence of tasks order the more complex stage sequence.

There is a number of reasons for choosing whether or not to use interviews. Open ended interviews, for instance, create variability, delaying the operationalization of the variables that the researcher thinks are important. During such interviews the participant may or may not choose to discuss a particular topic which may be important for raising the stage score according the system based on informational references. While solving specific problems, on the other hand, the participant is more likely to obtain clearer instructions from the researcher regarding which particular topics it's important and relevant to address. The MHC does not make this contextual distinction and any combination of open-ended questions and more specific problems may comprise an acceptable format of testing stage.

Problems commit the researcher to an operationalization of the issues. They often do not measure the actual proficiency of the participant, because they contain demands that are not central to the concerns of the researcher and therefore may also underestimate the stage score. As many testing manuals point out (Anatasi, 198 Anastasi, 1982), more than one form of the problem has to be generated in order to help the researcher make appropriate evaluations. So-called warm-up effects reflect the transfer of competence from one domain to the one being examined. Unless the transfer process is also examined, initial results of single items can be very misleading (Commons & Ducheny 1979 Commons & Ducheny 1979).

Examples of Scoring

Ego Development – Kegan (1982) Kegan (1982 **Kegan (1982) (** Sinclair & LoCicero, submitted**Sinclair & LoCicero, submitted). Concrete stage 8 (Stage 2/3 Kegan)**

Osama bin-Laden: Bergen (2001 Bergen (2001, p. 55) quotes Osama in a conversation with a Pakistani journalist as saying, "My father was very keen that one of his sons should fight against the enemies of Islam. So I am the one son who is acting according to the wishes of his father."

Analysis: This statement might readily be interpreted to indicate that bin Laden's earliest associations with Islam occurred while his construction of meaning was reflective of stage 2-3 reasoning. Moving towards a stage 3 mutuality, there appears to be a quality of embeddedness within the needs and wishes of the family and culture (Concrete Stage – Stage 2/3 Kegan) with respect to Islam – evidenced by bin Laden admitting he is acting "according to the wishes of his father."

Attachment A. Male, Age 8, Stage 7 Primary-Step 3 Smash, Substep 2: Over generalization: **Transition to Concrete:**

Interviewer: What happened to the toy that your cousin lost?
Child: Yeah. He threw it up someplace. It must've landed in a gutter or in the streets.

Analysis: He talked about his own point of view in an earlier response. Now he has reversed and is talking about his cousin (who threw his toy "some place"). He is at least considering what his cousin did and how that affected not being able to find the toy. However there is no specific co-ordination between what the cousin did and the fact that the toy cannot be found. The substep of transition that he is showing is over generalization. He would blame his cousin for anything, so he does not have "correct rejection" strategies - just a large number of hits.

Attachment N. Male, Age 9, Stage 7 Primary-Step 3 Smash: Transitional to Concrete

Interviewer: Why weren't you very mad when your friend moved?
Child: Because I did have a say in it, sort of. I asked them to stay, but he said Oh we've been planning to move for about a year.

Analysis: This child spoke about these experiences almost entirely in primary order terms. But he made three statements approaching the concrete order (of which this is one). This statement involves more than just himself. He recognizes that others have points of view, but he does not really refer to their point of view. As a result this was coded as being at the transition substep smash.

Attachment K. Female, Age 8, Stage 8 Concrete-Step 2 Relativism: Transition to abstract

[When asked whether she was afraid due to the loss of her hat:]
Child: I just wasn't afraid. Because, I don't get afraid when I lose something. But if it's something very, very special to me, really, really important and I always loved it, then I would be a little more scared and worried that I lost it. I'll never see it again.

Analysis: She seems to have two ideas: some things that are not very important do not make her get very afraid; other things that are very, very important would make her get more afraid. She seems to be beginning to deal with different values of "importance" and of "fear" and relating them to each other, but she is not doing the relating explicitly. She also seems to be thinking hypothetically; she does not have a specific thing in mind but says "If it's something…" As far as what step of transition she is showing here, it is relativism: she has both points of view, but does not co-ordinate them, instead she alternates between them.

Attachment C. Female, Age 9, Stage 8 Concrete-Step 3 Smash: Transition to abstract

[When her cat died:]
Child: It made me feel like I had to do something because I wasn't taking it that hard and like, the other two were.

Analysis: This is a story, with specified roles: self and other family members. She is stating what sounds like a

social norm, but it is not a general social norm. It is specific: because these two people are upset, she should be upset. This is transitional to abstract, because generalized social norms are abstract. The transition substep is smash because the social norm is not free, it is stuck on these two people and this situation.

Societal Stages. Concrete stage 8

In general, the concrete stage is defined by following fairly straightforward or simple social rules and coordinating of the perspectives of others only insofar as how others affect the self or close group. For example, the rules are used to form cliques and plan deals between individuals. The end result at this stage is the formation of interrelations, social events, reasonable deals and constructing a causal form of knowledge of what happens among others. There are no centralized governmental bureaucracies in societies characterized by a "pure" concrete stage. At this stage, rule is exercised by making deals and exerting raw power in the "friend or foe" dyadic relationships. Leadership and policy are determined simply by weapons, money, and tribal and family affiliations. The Somali and Afghan warlords are good examples of concrete stage power-based governance. Government may be based on ethnic and religious affiliation, as was the case in Bosnia in the 1990's civil war. Feudal, and archaic countries are examples. There is some degree of popular support within these religious factions: Roman Catholics (Serbs) who supported an ethnically cleansed greater Serbia, Eastern Orthodox Catholics (Croats) who dominate in Croatia, and Bosnian Muslims.

In much of the world, there is a clash between religious, ethnic, and tribal factions with each other and with other cultures. Individual leaders lack social and political perspectives in taking empathy. They have no concern for people with whom they are not associated, since their dyadic relations are based on personal contact with and knowledge of others. For example, Lenin and Stalin said they were not concerned by the innocent people caught up in the terror campaigns by the communists. Also, there were many in the US who were not concerned with the death of American Indians. The cultural and institutional atmosphere of concrete stage social arrangements is characterized by the dyadic patron-client relations that provide the primary social glue. For example, in Afghanistan, war lords and individuals changed sides as part of monetary bargains. Such governments are viewed from the Western perspective as corrupt, yet from the concrete society's perspective, the bribes and secretive deals are viewed simply as "the way things are/get done." The activity of hostage taking is seen by some as a legitimate financial and political activity, ignoring the perspective and/or feelings of the person taken. People can be bought and sold, which further illustrates the non-empathic views of individuals in a concrete stage society.

Other concrete stage societies, such as China during the cultural revolution, provide models for subjugating and brutalizing people. Often punishment is public and celebrated. In the event that these societies fail, due to invasions from the outside, the people socialized by them persist with their former punitive and distrustful behavior. It makes it difficult to have them move up in stage. The benefit is that such strict governments discourage terrorists because the government operates its own terrorism against dissidents, including would-be terrorists.

Another glaring example of concrete stage action is seen in attempts to regulate free speech and media access. Throughout the world, there are different degrees of contingencies regulating these domains of free speech and media access. These regulations help one identify a country's developmental stage. In concrete stage societies, the people have very little access to public broadcasting and thereby are not allowed a voice in the government. For example, the Taliban government of Afghanistan forbade the use of satellite TV and VCR's. Implementing complete bans on such aspects of society are attempts to regulate and control the individuals of the society. This, in turn, impedes the development of the society as a whole, which is characteristic of the concrete operational stage.

The concrete stage is the modal stage for feudal, and archaic countries. That does not mean that people do not operate at more complex stages in various domains. They may repair complex weapons (formal stage), build complex networks of terrorists using email and webpages and the like (formal stage). We will address this issue in the discussion of higher stage actions.

Societal Stages. Concrete stage 8: Transition to Abstract stage 9

At the concrete stage, the beginning of the transition to the abstract stage requires clear contingencies and strict law and order. Otherwise, chaos and anarchy including tribal, regional, and warlord fighting may ensue. A big country or coalition must occupy the country for a period of many years. There has to be leadership and institutional structures that exert the necessary strong authority over society to both stabilize and unify it for the first time. The leader has to be an authoritarian and rule by decree for a long period of time. To move from tribalism, [in which a]

warlord or tribal leader led, to nationalism, one has to appoint a benign strong leader, and establish a common language and a common military.

At the transition to the abstract stage, group norms come into being. This allows for societies to first build nationalism. For nationalist norms to exist in the group, a number of critical steps must take place. First, it is important to create both a public and private national television system. One also has to supply democratic norms. A helpful mechanism to foster this change in institutional and cultural atmosphere is the introduction of such patriotic slogans that can be understood at the concrete stage, for example, "Life, liberty and the pursuit of happiness," in the early US, and "Truth and Reconciliation," in South Africa. In the transition to the next stage, centralized government structures are attempted, but the institutional and cultural atmosphere of warlord-led tribal societies results in ineffective centralization efforts. This is greatly illustrated by the difficulties of the central government of Afghanistan in 2004, where elections had to be postponed because of the fighting.

A country or regional coalition should establish an advisory legislature of elders, tribal, regional and military leaders. Bringing the existing concrete societal structures into the new abstract structure is the way to replace prior rivalry with greater status, a reinforcement contingency. Structurally, it is irrelevant that some of these warlords and tribal leaders were once the enemy. Yet, this is a crucial transition to accomplish because, with respect to political atmosphere, the citizenry's level of distrust of "the enemy" will dissipate very slowly. However, bringing the previous tribal and military leaders into the government exposes them and embeds them in the more complex stage structure. It also reduces their alienation from losing, and thus their capitulation to the cultural atmosphere that still pervades their former parochial followers. The new institutional atmosphere will present the new challenges needed for concrete stage acting leaders to adapt to the new abstract institutional structure. Governments may hold elections because at the abstract stage, variables come into being. The new variable associated with elections is popularity of the politicians and leaders. The electoral process tends to replace the exercise of raw power.

Throughout this transition, there are still problems in running governments. What we might think of as bureaucracies, are more like fraternities. The affiliation is to the unit and working group, not to the overall organization and the public it serves. Harmony is more important than efficiency. The social practices oppose modernization and improvements. Government may accept certain kinds of help. Technical assistance is one improvement that seems to be accepted in many places in the world. Improvements in public health are an outstanding example of this. Health and family planning have had large successful impacts in Taiwan, Uganda, India and China.

 In order for such a country, which operates at the concrete stage, to move to into the abstract stage pre-bureaucracy, a number of changes must occur. A pre-bureaucracy consists of organization minus logical regulations and operationally defined roles. Part of these required changes must be to establish an infra-structure and more modern bureaucracy. First, a major goal of bureaucracy is to establish a taxation system, bookkeeping and records, and transparent accounting. At the abstract stage, the first steps toward this goal may be taken. This requires training and supervising people in the use of computers, data entry, bookkeeping on the computer, record keeping, and simple accounting practices based on simple computer programs. It is likely that these countries also do not have a working private banking system. It may be necessary to set up national banks, private banks, and most importantly, banks that lend to micro bankers, as well as a micro banking system.

Furthermore, part of the capital formation process that leads to stability and a high degree of investment in the society is property ownership. About 500 million people worldwide are squatters (deSoto, 1989 deSoto, 1989) living on land that they have no legal right to occupy, usually on the outskirts of cities. Squatting presents a growing economic problem in less-developed countries. For example, DeSoto's (1989) deSoto's (1989) program led to four million Peruvians getting legal titles to their land and reducing the power of the Shining Path. All of this regularizes economic activity and increases the stake of people in the government.

One huge change for many of these societies must take place. All the girls, as well as the boys, must be put in public schools. The biggest impact on both boys and girls in their own terminal stage of developmental is their mother's education. Mothers' education is predictive of how far their children go in school, of their health status, and of the amount of ambition they possess (LeVine, 1980; 1987; 1995 LeVine, 1980; 1987; 1995, Schultz, 1991 Schultz, 1991). Furthermore, higher education leads to a reduction in family size so that the investment per child will be higher (Ainsworth, Beegle & Nyamete, 1995 Ainsworth, Beegle & Nyamete, 1995; LeVine, Uribe, Correa, & Miller, 1991 LeVine, Uribe, Correa, & Miller, 1991; The Impact of Female Schooling on Fertility and Contraceptive Use. World Bank Living Standards Measurement Study.). This is another form of investment that

leads to a reduction in terror. Societies that offer hope and real opportunity have much lower rates of terrorism. Because one of the best predictors of the rate of economic development is mothers' education (e.g., Castañeda & Aldaz-Carroll, 1999; Castañeda & Aldaz-Carroll, 1999; Jejeebhoy, 1996 Jejeebhoy, 1996), it is not surprising that almost all terrorist societies have a large section of the population who are poor and do not have much hope for societal advancement. In order to improve upon this state, it is crucial that all children be put in public schools. The schools for boys and girls may even be separate. Either way, this will not only reduce feelings of economic hopelessness, but it will also ensure education of the country's future generations. **

Wisdom-Marchand. Abstract stage 9

Level I Baltes (Smith, Dixon, & Baltes, 1989Smith, Dixon, & Baltes, 1989)
     Focus on only one of the characters in the dilemma (in other words discuss the dilemma from the point of view of only one of the characters)
     Bipolarization/dichotomizing of the problem
     The behaviors, choices and personalities of the characters are seen as stable and fixed
     The opinions are presented as certain, without uncertainties, doubts or conflicts
     The behaviors are very stereotyped and the subjects tend to reduce a complex problem that is not necessarily well-structured [in the sense of having things that are indefinite or not specified]   into a simple and clearly structured problem

Participant: Mary should have done exactly what she did. It would create many problems to leave one's family, particularly when you have children. In any case, she accommodated herself to the life that she chose. She feels comfortable with her husband and with her children, to whom she gave every kind of support for their schooling and every kind of love. She stayed at home, which is always an agreeable [comfortable] space for people, isn't it? She feels herself to be extremely fulfilled and does not regret at all that she did not invest in a professional career. She doesn't feel at all sorry because when she meets her friend she sees that the friend feels isolated, does not have many friends, and while she is very successful in her profession, she nevertheless feels herself to be very isolated from other people, even though she has high professional status. This friend is a person who did not create relationships, who increasingly grew apart from her family (relatives) and from her friends, paying attention only to her career (as a teacher of young children).

Analysis**:** Participants says**, "**In any case, she accommodated herself to the life that she chose. She feels comfortable with her husband and with her children, to whom she gave every kind of support for their schooling and every kind of love." This is abstract stage. The variables are: accommodated versus not accommodated; life she chose versus one she did not choose; comfortable versus uncomfortable. Participants also says, "She doesn't feel at all sorry because when she meets her friend she sees that the friend feels isolated, does not have many friend, and while she is very successful in her professional, she nevertheless feels herself to be very isolated from other people, even though she has high professional status." There are three abstract propositions: She is very successful in her professional; she nevertheless feels herself to be very isolated from other people; even though she has high professional status. One might think that there is a causal relationship in negative form but it is just an assertion, no evidence given and no logic. "even though she has high professional status, [she] nevertheless feels herself to be very isolated from other people" (Note, that in Kohlberg, Kegan, Armon etc, this would be stage 3.)

Wisdom --Marchand. Abstract stage 9 Level I Baltes **Baltes** (Smith, Dixon, & Baltes, 1989 Smith, Dixon, & Baltes, 1989)
Participant: In addition to the fact that she was surrounded by the things that she has and likes, by people that she likes, and that taking care of these people is a good thing...for sure, she also felt the disadvantages of staying at home, of being a lot of time by herself...she would miss being able to go out, to know other people...

Analysis: This all seems framed in terms of abstract stage sociality.

Wisdom-Marchand. Abstract stage 9

Participant: She is going to go through a retrospective re-examination [of her life.] She is going to remember about her parents, her siblings, the people that she knew...her economic background [level], cultural background, what she had studied in school...the socioeconomic status is what determines or effects things. Because she could have come from a very favorable background, but not have wanted to accomplish a lot, isn't that true...She just puttered along, it was she who decided not to go further in life. She was particularly interested in making a career of marriage. She

defended traditional values: the woman as housewife, the woman as part of the family, defined in terms of the husband and the children.

Analysis: Abstract stage: an assertion:
A: socioeconomic status is what determines or effects things
B: She just puttered along, it was she who decided not to go further in life. MLC An assertion of free-will. No evidence
C. She was particularly interested in making a career of marriage.
Again, circular reasoning the outcome is seen as being a cause because of interest. Such unsupported assertions are abstract stage.
D. She defended traditional values: the woman as housewife, the woman as part of the family, defined in terms of the husband and the children.
These are all statements of ideology and social normative statements from this person's political group.

Ego Development - Kegan (Sinclair & LoCicero, submitted **Sinclair & LoCicero, submitted). Abstract stage 9**

Excerpt: The new Interpersonal contexts to which bin Laden belonged were comprised of people with the same ideals and a common purpose, in turn giving form and purpose to its members. Because many including bin Laden were adamant for a return to the Islamic idealism of the past, they began to offer themselves to larger movements bent on achieving these ends, fueled by radical ideologies such as those exhorted by Azzam (Lewis, 2002 Lewis, 2002). Building on early experiences with his father, this shared ideology radically shaped Osama bin Laden's construction of self, and fueled the creation of al-Qaeda. From a developmental perspective, jihad evolved into the primary source of meaning for bin Laden, although his orientation to it was distinct in quality. Jihad provided an outlet for the shared ideology that was fostered by people such as Azzam, and fueled by the collective, militant Islamic contexts of which bin Laden was a part.

Analysis: To the extent that the desired ends were the same and the purpose shared by the group, bin Laden was constructing a self in relation to these contexts at an Interpersonal level (Abstract Stage 9 – Stage 3 Kegan) (Kegan, 1982) Kegan, 1982).

Wisdom-Marchand. Abstract stage 9- Step 2 Relativism: Transition to Formal

Participant: Well, she can think about whether it was worth it, or not, for her to have decided to NOT dedicate herself to a career, to not study, to leave all that behind in order to stay with her husband, take care of and raise her children, to give her children a better life. Because a person, from the moment they dedicate themselves to a career, they don't give much attention to their children...she might think about whether it was worth or not, about whether she is sorry. If she has a good life, if her children were worth it...then she would most likely think that it was probably worth dedicating herself to her children and her husband and to have left behind her professional career.

Analysis: There are assertions of things as facts which are not. Because a person, from the moment they dedicate themselves to a career, they don't give much attention to their children. Hence this is over generalization at step 3-1hits with false alarms. The way the question is framed, it pulls for transition step 2, relativism. There is some formal logic as follows:
   A: Because a person, from the moment they dedicate themselves to a career
   B: they don't give much attention to their children.
   A —> B
   C: If she has a good life, if her children were worth it
D: then she would most likely think that it was probably worth dedicating herself to her children and her husband
   E: to have left behind her professional career.
   C —> D
   C —> E

Societal Stages. Abstract stage 9

In general, the abstract stage is defined by forming variables out of finite classes, and making and quantifying abstract propositions. This allows for the formation of variables such as stereotypes and quantification (none, some, all). The end result at this stage is the use of comprehensive set of variables: time, place, act, actor, state, type;

quantifiers (all, none, some) and categorical assertions (e.g. "We all die "). In abstract stage societies, there is an abstract form of affiliation, such as belonging to a party, movement or religious organization. Unlike concrete stage social relations, the relationship no longer has to be local or personal. There is a often strong preference for a powerful charismatic leader, with the primary need being a strong, paternal authority. One may see this in the transitional government in Iraq in 2004. The people want a strong leader to achieve peace and harmony. It is at this stage that bureaucracies come into being, yet they are not fully formed. They are merely organizations that are tied to the leader. In politics, that leader may have more extensive power to rule by decree. The organization serves. For example, consider Iraq under Saddam Hussein. There was a water department and a power department but Hussein could, and did, interfere in each. Appointments to jobs favored his family and tribesmen.

Most importantly, the leader of such a society may espouse what appears to be an ideology. Quite often, such apparent ideology is nothing more than a statement of prejudices, stereotypes, and definitions of the "in group" and the "out group". Such dualisms of "us vs. them" are characteristic of the abstract stage, and patron-client relations continue to characterize much of the cultural atmosphere even while the institutional atmosphere does not appear to overtly support them. One might then ask, what role does ideology play in these societies? This can be answered by considering one large branch of terrorists, the one that comes from the Muslim Brotherhood and the Wahabie schools. The militancy of these groups is an example of abstract stage operations and illustrates the dominance of certain ideologies in such societies.

Furthermore, consider the example regarding regulation of free speech and media access. In China, it is a common governmental practice to try to block the use of email and the web. Due to the fact that this is difficult to do, the government is not entirely successful in this endeavor. Therefore, the people of China still have some access to public broadcast (through the web) and free speech. However, as a counter attempt to limit free speech, the government has imposed restrictions on political protests and the like. Although these governmental contingencies are characteristic of low developmental stage operation, they are more normative practices than those exercised in Afghanistan. Therefore, China would be said to operate at the abstract stage.

At the abstract stage, most terrorist groups have multiple sets of norms. There are pro-social norms within the group. Order and conformity are very important. There are also strong anti-social anti-western norms, which help to unite the group, on the grounds of a common enemy. As said before, many of these groups represent "traditional" values, ones that have long disappeared in large segments of the population in the West. The alien social and religious norms puts these groups at odds with West. For example, groups of terrorists aligned with this and related ideologies come from or operate primarily in Saudi Arabia. Many Muslim countries have Kings, dictators or are, at best, very limited democracies functioning at the abstract stage. Within them there are religious schools and other institutions that promote anti-social, anti-western norms characteristic of the abstract stage. Other Muslims groups operate in the Philippines, Iran, Syria, Palestine. There are also many leaders who act at the abstract stage from all over the Arab world who are benign and in favor of modernization, as in Qatar, Jordan, Morocco, etc. There are also other terrorist groups of different ideologies such as the Irish Republican Army. Since the fall of the Soviet Union, there are still a few communist insurgency groups: Peru's Shining Path, Columbia's, and Nepal's Maoist Communist party. These groups base themselves on some form of communist ideology. The abstract stage might be the modal stage in many 2nd world countries.

Societal Stages. Abstract stage 9: Transition to Formal stage 10

Abstract stage societies ultimately fail because there is neither logic nor empirical basis to decisions made by the government. For example, as popular as Juan Peron was in Argentina, he eventually destroyed the economy by his populist policies. At this stage, governments are often inconsistent and there tends to be chaos. The people who work for the government request that there be some regulations that they can follow, rather than obtaining approval for every decision made. There is also tremendous pressure to have regulations that reduce corruption. The process of voting moves the government up in stage over time because the people vote for candidates that have strong track records in reducing such corruption. Hence, the abstract stage popular voting leads to formal stage logical regulations with empirical checks that the regulations are being followed.

Often nepotism laws (government employment) and regulations (business employment) are adopted to decrease corruption in government and large organizations. Corruption is seen as driving up costs of doing business. Small family owned businesses may be fiercely competitive because everyone has a stake and everyone's effort counts. There are lots of these businesses. But in the government and in larger groups, with nepotism, family and political connections have little immediate effect on the income or job security of other family workers. Relatives, friends

and political allies thereby swell the bureaucracies with non-productive workers. The nature of organizations reflect moves beyond being personal to more impersonal. There may be decentralization of economies with small companies that employ a number of employees coming into being. There might also be stock ownership rather than all businesses being totally family owned.

Power is more clearly defined by legal and regulatory roles, both for politicians and businesses. Multi-religious states that have to be secular slowly become more secular. The attempts to exclude groups backfire over the long run. Many such groups agitate for a separate country. Sometimes, large groups of people leave. One solution is to allow for religious freedom. This requires a logical and empirical analysis to go beyond the normative majority rule. Religious tolerance reduces religious terrorism because everyone's rights to their religion are respected. Governments who are fighting terrorism in countries such as Iraq, Afghanistan or Chechnya, must maintain the functions of the infrastructure or work to restore them.

Wisdom - Marchand.   Formal stage 10

Level II Baltes Baltes
    the subjects are able to 'decenter' and discuss the dilemma from the point of view of more than one of the characters
    they start to reflect on diverse aspects of the question, on the different points of view that may be possible
    they show an awareness that the problem itself is 'deficiently' constructed
    The options and decisions start to be conceived of as relative, idiosyncratic and depending upon situational factors. They begin to take into account the contexts, the priorities and the objectives.
    They generally do not integrate (together) different solutions, and when they do so they tend to [[do so by sending? or perhaps postponing? these integrated solutions to the future]]

Participant: It is an option..., an option that at that time seemed to her the right one. She will say to her friend, look! I left my career (my life as a professional person), but I am not sorry to have done so, because instead I dedicated myself to my sons, dedicated myself to my husband, and in fact, every went well, I don't need a professional career. This also has to do with the way that one thinks, with the necessities that we feel [are important] because they are people who are housewives for their whole lives and it doesn't bother them, while there are other people for whom being a housewife does not fulfill them, they want more from life. The friend with certainty will say to Mary that being dedicated to a career will have its advantages and its disadvantages because she is a successful woman, with another understanding of life. As it happens, in the moments of solitude it is really solitude. She is alone, arrives home and is alone. She has no husband, has no children...She might think at some later time that it would have been a different life if she had [not] completely dedicated herself to her professional life, if she had done the two things at the same time, not dedicated herself 100% to her husband and children, but dedicate to them only 50% and leave the other 50% for herself. This would also be something that would be of value. {{não deixava de ser também uma valorização individual .}}

Analysis: Participant says, "'I left my career (my life as a professional person), but I am not sorry to have done so, because instead I dedicated myself to my sons, dedicated myself to my husband, and in fact, every went well, I don't need a professional career." This is formal stage 10. Note the logic .. Because .. In fact, everything went well. If the following were the only statement, it would be abstract: "This also has to do with the way that one thinks, with the necessities that we feel [are important] because they are people who are housewives for their whole lives and it doesn't bother them, while there are other people for whom being a housewife does not fulfill them, they want more from life."   "Some people are bothered and some are not" is a description of a variable. There is some logic, in that there is an assertion of non-causality, that is being a housewife does not cause satiation. It is some unstated property of the person. This is an interesting formal stage 10 use of utility, "She might think at some later time that it would have been a different life if she had [not] completely dedicated herself to her professional life, if she had done the two things at the same time, not dedicated herself 100% to her husband and children, but dedicate to them only 50% and leave the other 50% for herself. This would also be something that would be of value. {{não deixava de ser também uma valorização individual .}}

Ego Development -- Kegan (1980) **Kegan (1980) (Sinclair & LoCicero). Formal stage 10 (Stage 3/4 Kegan)**

Excerpt: According to Bergen, "After Hussein's forces did invade the small, oil-rich state on August 1, 1990, and threaten the security of Saudi Arabia, bin Laden immediately volunteered his services and those of his holy warriors" (2001, p. 80). After having just defeated one of the world's two super powers, Iraq was perceived as an

insignificant problem for the mujahideen, and for bin Laden who by that point was an authority. However, the Saudi royal family declined bin Laden's offer, instead enlisting the support of the United States of America. This infuriated bin Laden, and set into motion the new jihad against the west (Bergen, 2001Bergen, 2001).

The Saudi government turning their backs on the mujahideen was significant for several reasons in terms of the effects it had on bin Laden's development. First, even though the bin Laden and Saudi royal families had been close for a long time, this outright rejection implied the Saudis thought the mujahideen were impotent, despite recently having been funded by the Saudis to fight the Soviet Union.

Rather than try and understand the threat posed by the Iraqi regime, or that the Saudi government may have had good reason to believe that the American troops were better prepared to protect the place of the two holy Islamic shrines (Mecca and Medina, [Bergen, 2001 Bergen, 2001]), bin Laden instead interpreted the move as a threat to the strict version of Islam to which he adhered. The reasons for this were rooted in perceiving Americans (now operating in the Islamic holy land) as defilers of Islam.

Analysis: Developmentally, this was indicative of bin Laden's embeddedness within a particular perspective, as he appeared to be unable to recognize the complexity of the situation, and there was no attempt at moving beyond the Saudi insult to understand the larger picture. (Formal stage 10, Kegan 3/4). [Stuck in linear logic –Americans are defilers of Islam, and therefore cannot defined Saudi Arabia.]

Therapy Stage 10 Formal, Step 4 (0):

Participant: I play slowly enough to anticipate each upcoming section of the music.

Analysis: Formal, stage 10. An implied "if… then" relationship logically connects two abstract variables. The first variable is the speed of playing, and the second is the anticipation of upcoming sections of music.

Therapy Stage 10 Formal-Step 1 Negation: Transition to Systematic

Participant: "He sees intimacy in a different way than me."
Analysis: This is a functional relation: "If he sees intimacy as 'x' then I see it as 'y' and vice-versa." This is a comparison between two abstract propositions.

Wisdom - Marchand. Stage 10 Formal Step 2 Relativism: Transition to Systematic

Participant: Maybe at this moment she thinks that it could have happened that she could have balanced things, and not have abandoned one of them, she could have balanced the two parts. I think she dedicated herself to her family because the work did not motivate her that much... I don't know. If it had happened that she really liked her profession and she had applied herself to it (her profession), maybe she would have managed to reconcile/coordinate the two, as there are so many women who do, aren't there? Well, that's it. (Teacher, 24)

Analysis: Formal, step 2 in transition to systematic. There are multiple causal relationships. But they are not coordinated but put into a context as to when each applies.

Wisdom - Marchand. Stage 10 Formal Step 2 Relativism: Transition to Systematic

Participant: The woman, upon meeting her friend, might think of the things that she could have taken advantage of if she had a profession, and the benefits for her personal development, but if she had a profession she would not have had children, nor any time to dedicate to them, at least not as much time as she had being a housewife. When the children have grown, or left home, she could, if it happens, rethink again her life and maybe even return to a profession.

Analysis: This is formal transitional, step 2. It is:
A. under one set of circumstances
B. Upon meeting her friend, might think of the things that she could have taken advantage of if she had a profession, and the benefits for her personal development, she had a profession she would not have had children, nor any time to dedicate to them, at least not as much time as she had being a housewife.

Therapy Stage 10 Formal-Step 3 Smash: Transition to Systematic

Participant: "Need to explore and respect each other's wants and desires and function as a team [to build intimacy]."

Analysis: The adult has a "needs to do" list of the conditions required for building intimacy. This is multiple causation; the conditions are combined in an additive fashion at the formal stage. The social relationship, as a system that builds intimacy, is not explained as a co-ordinated system of viewpoints that balances individual with common needs or desires. "Explore and respect each other's wants and desires" indicates a notion of maintaining independence and "function as a team" dependence, but the adult doesn't account for how to co-ordinate them.

Societal Stages. Formal stage 10 (Commons & Goodheart, submitted) **Commons & Goodheart, submitted)**

In general, the formal stage tasks require solving problems using logic, mathematics and empirical investigation in order find out what is true. At this stage, logic is linear, and one-dimensional, and the end result is formation of relationships out of variables. But only a single variable at a time may be examined. People functioning at this stage begin to take an empirical interest in how to get others to be more productive, how to train them and how to distribute the vastly greater wealth. Again, governments, societies and countries are characterized by the modal stage at which individuals within those institutions operate. Formal contracts may be drafted. These in turn lead to formal economics and law. Social relations, which were already more abstract than at the previous stage, now come under the control of the contingencies of the marketplace. Also one's role within organization is critical. The competition between individuals is regulated and relatively civil. Economic production becomes increasingly organized, mechanized, and automated. Extensive written law and regulations develop, as well as extensive regulations, and are carried out in a quite literal fashion. Written regulations and written procedures form the basis of bureaucratic governments at this stage. They are also used to moderate crime and terror. Enforcing both criminal law and civil law becomes utilitarian in that it promotes trade, commerce and investment. Terrorism reduces the confidence in economic activity by introducing great uncertainty. It there by reduces investment. Writing becomes universal, and simple arithmetic, elementary algebra (in modern times), and rudimentary rules for argument in the narrative become necessary. Questions of religion become central to not only local government, but also to war. The countries that operate at this stage do not necessarily have a real multiparty system, even if they have free and fair elections. This stage was the modal stage for countries of the eastern block and many Latin American countries.

Societal Stages. Formal stage 10: Transition to Systematic stage 11

As societies move from the formal to the systematic stage, one overriding set of actions becomes clear. There is an increasing understanding that the world is complex and that there are no simple solutions. One sees this in debates on policy where not only the intended effects, but also possible unintended side effects, are presented. The government develops sophisticated systems of measurement and analysis such as the Bureau of Standards, the Bureau of Labor Statistics, the Federal Reserve, the Federal Drug Administration, National Weather Service, etc. Each department of the government funds research, collects multivariate statistics and builds complex models in an attempt to understand the data. Most of these department grow out of simpler administrative units and write regulations. They engage in the rule of law rather than decree – a hallmark of the systematic stage. But because of the many countervailing forces, the government is forced to consider the problems in multivariate way. For example, the National Weather Service used to measure just temperature, humidity, barometric pressure, and wind direction and speed. It simply reported them and noted that a falling barometric pressure predicted storms – a formal operational relation. Now it has complex computer models that predict the course of storms.

When countries are really formal operational in action, with huge unresponsive and corrupt bureaucracies, terror is even more likely. Consider Sri Lanka, which was a model of orderly political and economic development before the Tamil Tigers began their campaign of terror. In fact, democratic elections were the occasion for the Tigers' campaign. Likewise, consider India, where the British colonials established elaborate governmental institutions that were developed further and made democratic by Nehru and successors, but nevertheless has been plagued by terrorist actions by several groups during the past two decades.

To move into the systematic stage, there is a necessity for institutions that function with checks and balances to reduce corruption. There have to be deeds to property, and courts with judges that have terms that cannot be altered by the government so as to force their political agenda. The police have to be supervised. Trials must be open. The press must be free.

Movement to the systematic stage has rapidly occurred in the Eastern Block countries. Most of them had a history of democracy before German and Soviet expansion engulfed them. Explicit contingencies for having democratic government, free-speech, and capitalist economies have had their positive effect. Foreign aid flows more and foreign investment increases as these countries become democratic with a law-based society. There is still more to be done, however. For example, to reducing the ethnic nature of these countries is a crucial step that needs to take place in order for further developmental progression to take place. There is also a need for the most advanced societies to better deal with dissent, terrorism, and opposition throughout the world. If this is achieved, these societies will successfully moved toward the systematic stage.

The modal stage today for the democratic Latin American countries is transitional between formal and systematic. For example, Mexico and Brazil have multiparty democracies with increasing amounts of private ownership.

Wisdom-Marchand. Stage 11 Systematic Baltes Baltes Level III

Level III Baltes
   subjects reflect upon the many diverse aspects of the question, of the different points of view
   they consider or propose various hypotheses
   they show an awareness that the problem is not well structured (does not have an easy answer) and that the possible responses will not be either simple nor universal
   they consider the contexts, the priorities and the objectives
   sometimes they express the need for more information about the situation
   they try to integrate different solutions, being conscious of the difficulty of carrying out these integrations
   the various options are understood to be a result of the complex and interactive nature of situations (of 'my' objectives, 'my' priorities and those of others)
   these options and arguments are frequently evaluated and re-evaluated.

Participant: If her children were ungrateful... or if they did not appear to be thankful that she had sacrificed her life and her own professional career for...then most likely she will think that it was not worth it.

Analysis:
F: If her children were ungrateful
G: if they did not appear to be thankful that she had sacrificed her life and her own professional career for
H: then most likely she will think that it was not worth it.
This is clearly systematic stage 11
F or G —> H
There are two causes, so there is m

Wisdom-Marchand.   Stage 11 Systematic

Participant: Rethinking one's life can be positive or it can be negative. It can be positive if she sees that the fact of not choosing a profession and dedicating herself entirely to her family compensated one for the other. Many times it does not compensate, for many reasons: maybe because the husband did not deserve such dedication or because the children did not become what the parents hoped for. In such a case, one might ask, "Why did I dedicate myself to this?" I did not do my professional life, instead I spent my time as a housewife, I was a maid and a mother the whole time, a wife, and now, what do I have? ... She is middle-aged, so she can still arrange a profession even though it will be quite difficult. She had to make a choice because people always have to make a choice. (Teacher, 44)

Analysis: This is interesting. This person reflects upon doing formal stage reasoning correctly.
C: Rethinking one's life can be positive or it can be negative. This is the variable and its two values
A: if she sees that the fact of not choosing a profession and dedicating herself entirely to her family compensated one for the other.
B: It can be positive
A –> B.

Wisdom-Marchand. Stage 11 Systematic

Participant: Many times it does not compensate, for many reasons: maybe because the husband did not deserve such dedication or because the children did not become what the parents hoped for.

Analysis: This is systematic 11, note the multiple causes, husband did not deserve, children did not turn out as hoped for.

Ego Development – Kegan (1982) **Kegan (1982) (Sinclair & LoCicero). Systematic (Stage 4 Kegan)**

Excerpt: Transition although this evolution in constructing self was indicative of internal transformation, various external factors contributed to it. Because of his wealth and connections to high-profile business and government officials throughout the Middle East, much of bin Laden's contribution to the jihad against the Soviet Union involved traveling throughout the Middle East for purposes of raising money to fund the mujahideen. Additionally, because of his family background in construction, he was able to import heavy equipment in order to build roads, hospitals, and storage facilities in Afghanistan. Reeve discussed this ability of bin Laden to affect the war by saying, "For the first time in his life bin Laden felt a sense of achievement and purpose" (1999, p. 164).

Analysis: (Systematic Stage 11 – Stage 4 Kegan, 1982)

Attachment M. Male, Age 41, Stage 11 Systematic-Step 0 Failure: Transition to Metasystematic

Participant: I lost my car, my marriage, my job, my health and a whole lot of other things at that same period of time so I can't say, you know, it was point 0. 0 centimeters of sadness associated with losing my motorcycle.

Analysis: Systematic because there was this whole system of losses impacting on him that he cannot point to one event or one variable as the cause of his sadness. It is seen as transitional step 0 because it is just loss with nothing else.

Therapy Stage 11 Systematic-Step 1 Negation: Transition to Metasystematic

Participant: I need to understand that John is a man of few words when it comes to love.
Analysis: The adult is negating blame. She is taking responsibility for constructing her view of John as an element of her overall understanding of building intimacy instead of blaming him (entirely) for blocking the process. (Negating blame is a rejection of a formal, linear view of causality.) The systematic level of complexity as explained here involves a context (i.e., "when it comes to love" is a distinct context) in which the self (i.e., "I need to understand that …") takes a view of the other's view of love (i.e., "John is a man of few words when it comes to love").

Wisdom - Marchand (2005 Personal Communication **Marchand (2005 Personal Communication). Systematic stage 11- Step 2 Relativism: Transition to Metasystematic**

<u>Level III</u> Baltes
     subjects reflect upon the many diverse aspects of the question, of the different points of view
     they consider or propose various hypotheses
     they show an awareness that the problem is not well structured (does not have an easy answer) and that the possible responses will not be either simple nor universal
     they consider the contexts, the priorities and the objectives
     sometimes they express the need for more information about the situation
     they try to integrate different solutions, being conscious of the difficulty of carrying out these integrations
     the various options are understood to be a result of the complex and interactive nature of situations (of 'my' objectives, 'my' priorities and those of others)
     these options and arguments are frequently evaluated and re-evaluated.

Participant: It would be ideal if a person who dedicated themselves to their family did not have to give up on a professional career, or the opposite, that a person who has dedicated themselves to their career ... this would not be an impediment to dedicating oneself to [one's] family. One arrives a certain age when, either in one case or in the other, one makes a revision of one's life. Within the profession there might be a great variety of shortcuts. Within these shortcuts there is always a big itinerary [list?] of successes and failures, of a lot of work, of satisfactions, but also of much dissatisfaction... The fact of having a profession and a family, the frustrations and lack of success

within the profession can be compensated for by the family, by one's dedication to the family, by one's children, one's husband, etc. The opposite situation can also occur, which is of a person who within the family encounters difficulties (illnesses, deaths of family members) and seeks to find a refuge or some compensation within their profession. In any case, trying to cast one's profession and one's family commitments as a kind of system of mutual compensations useful/possible/productive [salutar]. For instance, trying to find some compensation within the family when there is some aspects of one's professional life that is going badly can bring some benefits, but might also bring some harms, since the husband or children can be harmed by this ... in any case, thinking about the situation as a whole, if a person manages and this is very difficult, to put together a professional life that is intense and prestigious with a life that is dedicated to one's family, this is the best because a person who is only dedicated to their career, instead of establishing a family, then there is a lot of discuss. There are other aspects to pay attention to, because if a person dedicated themselves to their career and decided not to establish a family in order to dedicate themselves to their career, there is in this option a type of careerism that is a bit exaggerated, an almost dehumanization of work, or their career. Of course, if this is circumstantial, if this choice results from circumstances in the person's life... then I don't know. Of course, everything is relative.

Analysis: This is systematic stage 11; Participant says, "In any case, trying to cast one's profession and one's family commitments as a kind of system of mutual compensations useful/possible/productive [salutar]." This is a system consisting of two sets of mutual compensations. They are compared but not fully. "...in any case, thinking about the situation as a whole, if a person manages and this is very difficult, to put together a professional life that is intense and prestigious with a life that is dedicated to one's family, this is the best because a person who is only dedicated to their career, instead of establishing a family, then there is a lot of discuss." This is smash at metasystematic stage 12. She just shoves the two systems together willy nilly. Participant says, "Of course, if this is circumstantial, if this choice results from circumstances in the person's life... then I don't know. Of course, everything is relative." This is the relativistic step 2 in transition to stage 12. The first woman (Mary) does not have a profession...this also depends upon the time, when (during which period of time) she made this choice ... it also depends upon what type of man she married. Well, I have 'wandered around' within this conflict between the first woman and the second one, trying to find some kind of middle ground, to imagine a woman who would integrate her profession with her family, I tried various hypotheses about these choices, which ones would have been causes of their choice, possible motivating causes, internal and external circumstances, and the possibility of a solution....(middle aged teacher)

Wisdom - Marchand. Systematic stage 11- Step 2 Relativism: Transition to Metasystematic

Participant: I think that when one encounters a friend that followed a different life path than our own, who might be better off in life, or not, because if a person dedicates themselves only to their professional career...this might be a form of compensation for not having other aspects of one's life, or it might not be...only after one has reviewed one's life one can get a sense of whether this was worth it or not. Probably the friend is not that happy in this case. She has a professional career, she is a successful woman, but if it happens that she gets home and is alone...the person who dedicated herself to her children and her husband gets home and has a family, does not find herself alone in the more distressing moments.

   This has to do with her person's own way of thinking about the world, with what is important to us, because they are people who are housewives their whole lives and it does not bother them, while there are others for whom the fact that they are a housewife means nothing at all to them, they want more, they need to get out of the house, to have other activities and things to occupy them.

Analysis:
I: This has to do with her person's own way of thinking about the world
This is reflecting on a person's own way of thinking. If a persons own way of thinking is a system, then this section will be transitional step 2 to metasystematic.
J: because they are people who are housewives their whole lives and it does not bother them,
K: there are others for whom the fact that they are a housewife means nothing at all to them
L: they want more, they need to get out of the house, to have other activities and things to occupy them.

Attachment D. Female, Age 41 Stage 11 Systematic-Step 2 Relativism: Transition to Metasystematic

   Interviewer: How did you come to change your mind [about your whole way of looking at life, as a result of living through the war in your country]? Was it just the fear of death?   …
   Participant: Well, it was the fear of death. [and somewhat further down in the same statement:]
Things like this, you can't have pink ideals when the situation around here is like that. And you have to live day by day. You just cannot plan anything not even for a week. Lack of water, lack of sometimes bread…

Analyses: The reason that she changed her mind is partly because of the fear of death. Her whole way of looking at life changed as a result of death becoming so immediate. This was coded as being at the Systematic stage. She was talking about having one view of life (her first system) before the war, and having a second and totally different view of life (her second system) after the war. Further down, she is saying you can't choose a system, you can't have ideals - and the war is what made her that way - she couldn't choose the path - the war made her see things on a day-to-day basis. So, this is a comparative statement about two systems: the way things would have been, and the way they ended up, but there is no explicit comparing. She articulates each one, but alternates between describing one or the other; or rather she mainly describes the new system and leaves the interviewer to understand that the old system had none of this. This was scored as relativism.

Attachment E. Male, Age 23, Stage 11 Systematic-Step 2, Relativism: Transition to Metasystematic

[When asked to decide what was his greatest loss:]
Participant: ... but that hasn't [happened] to me yet, though, ummm, and I'm not sure I feel comfortable saying that the biggest loss I've ever had in my entire life, I think for some it might be easy to do. They could tell right off, but I really have different experiences, so I could say that something was a big loss, but I'm not sure it was the most…so is that going to be…?

Analyses: He talks about one system: his set of experiences that have given him a particular set of losses. He also refers to potential other systems containing the experiences of others that may produce other losses or more losses. Because he does not co-ordinate these two together, but talks on the one hand about his experiences, and on the other hand about the experiences of others, he is at the relativism substep.

Therapy Stage 11 Systematic-Step 2 Relativism: Transition to Metasystematic

Participant: I understand that it may not be possible to be both at the same time [to be a friend and pastor to an individual], and that what I am looking for from an individual at each particular time will be different as I am friend and pastor.

Analysis: The adult succeeds in bringing together the two roles of friend and pastor within the same individual. He alternates them in a systematic fashion so they do not conflict with one another. The adult does this by placing himself with the parishioner into two different temporal contexts. Here, there are two perspectives (from the same person) but they are not fully integrated. The transition process is not yet complete for this stage.

Wisdom - Marchand. Stage 11 Systematic-Step 3 Smash: Transition to Metasystematic

Participant: Taking care of the husband and the children might be an addition to the rest of one's professional career...if it had happened that one had had a different life, if one had dedicated oneself to a professional life, or had added one thing [e.g. family] to the other [e.g. profession], or had done both things at the same time, not dedicate oneself 100% to one's husband and one's children, but instead dedicate oneself only 50% to the family and 50% to one's professional life, this could still be a valuable contribution.

Analysis: This is at stage 11 smash. Note the fitting together the two previously contradictory paths: Taking care of the husband and the children might be a addition to the rest of one's professional career. (Teacher, 32)

Wisdom - Marchand. Stage 11 Systematic-Step 3 Smash: Transition to Metasystematic

Participant: She is middle-aged, so she can still arrange a profession even though it will be quite difficult.

Analysis: This is smash 3 to metasystematic.

Attachment J. Female, Age 25, Stage 11 Systematic-Step 3   Smash: Transition to Metasystematic

[When asked to describe her emotions after breaking up with her boyfriend:]
Participant: And yeah, I was angry too. I was angry at him because… because I knew there were some things about him that were wrong, and created these adverse reactions in me, and I didn't really know what they were, but I was really mad at him for just being himself.

Analyses: She was angry for at least two reasons: he did things or had characteristics that were wrong, but there was almost something about her that had adverse reactions to the things he did. So she is describing a kind of multi-variable system that determines her emotion, in this case, anger. Also, just the phrase "being himself" is a systematic notion; it consists of multiple behaviors occurring at multiple times and occasions. But this is not fully metasystematic because she does not know what is driving her nuts. She does not fully specify either her self system enough, or the "other" system enough to have a clear sense of what is wrong. She is at step 3, smash, in the transition to metasystematic, and most likely at substep 1.

Therapy Stage 11 Systematic-Step 3 Relativism: Transition to Metasystematic

Participant: I relax. I breathe. I visualize the pages ahead and the intent of playing and the feeling for the music to be expressed, all from a calm place. I keep practicing all the little snags to smooth out. I get plenty of rest, do Brain Gym and chi activities. I visualize success and calmness. I pay attention to the music and not the worry. I breathe some more, and repeat. I remember this and create it from out of my larger goals and purposes.
Analysis: The adult explains that he integrates success and calmness through visualizing both together. Also, coming from a "calm place" promotes visualization, and paying attention to the music and not the worry. Success and calmness are two "systems" that he is co-ordinating. At this point, he appears to be overgeneralizing how the two are combined. As systems, he explains how success depends on calmness, but not clearly how calmness depends on success.

Good Education Stage 11 Systematic-Step 1 Negation: Transition to Metasystematic Stage

Participant: Teacher says look, we're going to tell you things that you can write down. And if you forget you can look them up in the textbook. I promise I won't tell you anything that's not in a book you can look up. And you write them down and memorize them. And then we're going to have an exam. And you tell us back and we'll check off whether you told us right and whether you told us everything. And if you did, then we'll give you an A.

Now this is a very safe process for all concerned. There's very little risk for the faculty. I mean anybody can give an adequate lecture of that type. So it won't reveal you as a bad teacher unless you just don't prepare. It's also very safe for the student, right? Because if you do your homework, if you don't screw around and play tennis and waste your time, you can pass almost any course that is taught that way. And the conspiracy is that neither party, neither the professor nor the student do anything to reveal that not much learning has gone on. What do I mean by not much learning has gone on? What I mean is, when you confront people with problems for which the knowledge you have transmitted is supposed to be useful later on, they can't solve them.

Analysis: Participant includes components from an educational system based on predictable outcomes and rote memorization, as well as components from a system with risk. Participant does not co-ordinate these components and gives as examples subsets of different ways of education and assessing students at the Kennedy School of Government.

Good Education Stage 11 Systematic-Step 1 Negation: Transition to Metasystematic Stage

Participant: "I want to say one more thing about this. One of the ways, that it is very difficult to evaluate a process like this, is to ask the victims or participants of it at the time. It's characteristic of every experiment that we have made that…(in my view)…in every experiment that we have made that really involves learning, that the students and this includes mid-career adult students, hate it. Or say they hate it. They say, oh, don't do that. That's a terrible idea. They plead with us to teach statistics by the lecture method. They…we asked them for example to grade each other in class performance. We don't do it any more. They grade each other and that's half their course grade. So they are responsible for each other and responsible to the classroom and we are no longer the policeman of classroom behavior. And they have six dozen different elaborately reasoned explanations of why that's inappropriate and unethical and why we shouldn't do that. And it's our job to grade them and so on….

Analyses: Participant includes components from an educational system based on traditional lecture-type teaching and teachers doing all the evaluation, as well as components from a system based on the case method and students' evaluation of one another. Participant produces hits at stage 12 by describing components of an ideal system of student empowerment, but overgeneralizes by relying too much on examples and not co-ordinating components into a cohesive system –

You know I think the best example is of Ulysses tying himself to the mast. You know, where he sails past the sirens? Do you know the story? He sails past the sirens and he knows that they're going to sing and lure the ship to its death so he says, "OK, sailors, stuff your ears with wax so everybody can't hear anything. OK now tie me to the mast and unstuff my ears. So they sail past the sirens and he hears the sirens but he can't do anything about it and they don't hear it so they keep rowing. SO he's the only man in the world who's heard them and survived. And he knew that when he heard them that if he didn't tie himself to the mast, right, if he didn't restrict his behavior. Somehow we have to trust the students that have made an agreement like this. At the same time they can not want to do this week's homework and hope that we will not listen to them. At that moment. Tricky problem."

Moral Reasoning Stage 11 Systematic-Step 1 Negation: Transition to Metasystematic

Participant: Alright, a business is trying to provide some product or some service to the society. Trying to make a profit. The university is trying to educate people. So obviously, the activity is going to be different… I suppose you could say that there's a certain kind of interaction that's crucial for a university's place students and faculty which doesn't have a comparable place in other kinds of institutions.

Analysis: Participant does not fully describe or co-ordinate the systems of business and education

Good Education Stage 11 Systematic-Step 1 Negation: Transition to Metasystematic Stage

Participant: "Well, there are some people who like to think of everything as a business. It's a metaphor people use. And maybe there's some point to that, but it also can be misleading. There's a point to it in the sense that the university should worry about using its resources efficiently and should make sure that it's accomplishing its mission. But it's misleading in the sense that you can't simply take the standards that apply in a business enterprise and transfer them wholesale to a university, judge it by the same standards. You've got to realize that there's a different kind of enterprise going on."

Analysis: Participant does not fully describe or co-ordinate the systems of business and education.

Good Education Stage 11 Systematic-Step 2 Relativism: Transition to Metasystematic Stage

Participant: Well, because, I guess these goals are sort of Aristotelian [in] that the truth is always somewhere in between. And if we used all the resources of higher education merely to prepare for a career for example then the career wouldn't be worth having because life wouldn't be worth living. I mean if what you learned was how to do your job, then there wouldn't be much point in doing the job because you couldn't enjoy anything else. Conversely, if all you did was get very good at reading books and consuming experience, you wouldn't be any good to anybody else so why we should we care that you are having a good time?

Analysis: Participant alternates between the "preparing for a career" and "getting very good at reading books and consuming experience," without co-ordinating them.

Good Education Stage 11 Systematic-Step 2 Relativism: Transition to Metasystematic Stage

Participant: So if higher education is in the service of these three objectives, and if turns out to only be good for one of them, then, I'd say it won't even advance that one. That these aren't additive. You can't say, well, this is the Harvard School of Getting an MBA and Making a Million Dollars. The accusation that's leveled at the Business school is that all it does is teaches people to make a lot of money and not to be good people in some other sense. And then it turns out to be not worth it that they are making a lot of money. Because they are deficient in these other dimensions. So that I can't separate the quality of interdependence and talk about any one of these by themselves in isolation.

Analysis: Participant alternates between students to make money and becoming a good person without co-ordinating them.

Good Education Stage 11 Systematic-Step 2 Relativism: Transition to Metasystematic Stage

Participant: .., any large institution needs governance, which is to say that some people have to be in a position to

make decisions. So the university's no different from other institutions in that respect. What may be characteristic about universities is that much of the authority is decentralized, much so than any other social institutions. And that's because it's very important to allow faculty members to have a good deal of autonomy.

Analysis: Participant does not co-ordinate the two systematic goals of governance and autonomy

Good Education Stage 11 Systematic-Step 2: Transition to Metasystematic Stage

Participant: Whereas, if you want to call what the university does is producing a product, the product is the very interaction between students and faculty. I: Ok. What should that interaction be and why? I: What quality should it have? There are some very general features one might say as openness, willingness to explore new ideas, a willingness to question, to debate, to provide support for claims that are made...no one has monopoly or a lockhold on the truth. And if for every individual to a considerable extent has to make a judgement for him herself as to what's true. What makes sense. What connects to what.

Analysis: Participant produces a hit at stage 12, but basis for exclusion what is or isn't an element in the ideal university system is not sharp

Good Education Stage 11 Systematic, Step 2: Transition to Metasystematic Stage

Participant: I think that everyone has an inclination, maybe even a desire to be certain about how the world is. Among other inclinations. And what you want to do is lead a person to perceive that they are adults, so you explore the beliefs that people have and you show where there are questions and why one has to keep a certain openness in regard to those things because they are questions.

Analysis: Participant produces a hit at stage 12, but basis for exclusion what is or isn't an element in the ideal system of training is not sharp.

Good Education Stage 11 Systematic, Step 3 Smash: Transition to Metasystematic Stage

Participant: I don't mean by that there should be some separate course in a professional school because that seems to me a way of simply keeping ethos concerns marginal … in law there is a guiding ideal that the course system should be doing justice… when a lawyer helps two parties write a contract, the lawyer should have some understanding of what a fair contract is and what equal bargaining is. I: Why? W: Those are moral notions. Because this is a way of treating people with respect."
Analysis: Participant correctly rejects reducing moral concerns to a marginal level, but under generalizes the need for respect to one professional area, the law.

Societal Stages. Systematic stage 11

In general, the systematic stage is defined by people coordinating more than one variable as input and considering simple relationships in contexts. These coordinations and considerations construct multivariate systems, matrices and webs of causation. The end result is that events and concepts are situated in a multivariate context and systems are formed out of formal stage relations. Such systems include: legal, societal, corporate, economic, and national. Throughout this stage, governments work to achieve multiple goals simultaneously, society is predominately lawful, and there is advanced accounting practice that make business relatively transparent. The laws are carried out in a fashion that promotes the intention of the law, not just the letter of the law. There is functioning democracy and the governmental processes are orderly and mostly fair.

Current day Japan is a good case in point. The institutions of society are hierarchically organized. Also, status, and not just role within organization, is critical. The competition between institutions is regulated and relatively civil. Economic production becomes increasingly organized, mechanized, and automated. Increasingly, corruption is reduced at the systematic stage because of the introduction of professional norms, etc. Part of being a professional is having a role that is independent of personal affiliations and conflicts of interest (Gutheil, Commons, Miller, & LaLlave, 2000) Gutheil, Commons, Miller, & LaLlave, 2000). Markets, stock exchanges and the like produce complex impersonal relationships among people. Laws and regulation are developed to stabilize markets and prevent monopolies. These laws deal with multidimensional aspects of markets requiring advanced systematic stage actions. There are still readily identifiable "in groups" and "out groups" and war is still used in international

conflicts. Most importantly, there are very low rates of terror within such societies. What little terrorist activity there might be is covert state terrorism (e.g. the secret bombing in Cambodia, and possibly the atomic bombing of Nagasaki). Such state terrorism has a small national and societal effect. This is because such terrorism is directed outward towards other countries and people, and thus it may be less worrisome to its perpetrators. Individual terrorists often risk their lives and bring retaliation upon not only their own groups, but upon the countries in which they operate.

Societal Stages. Systematic stage 11: Transition to Metasystematic stage 12

In the transition to metasystematic stage governments, there are multiple parties that divide in a ideological spectrum. There are a number of ways to do this. In Europe, parliamentary governments are the rule. Most of the time, representatives are elected by a process called "first past the post." That means that the candidate that gets the most votes is elected. This generally forces two parties because third parties act as spoilers. This can be seen in a presidential system with a congress. This arrangement leads to a two party system in which the parties must compete for the momentary middle. This spectrum along which these parties exist must be multidimensional. In a parliamentary system, coalitions quite often have to coalesce to make it possible for a government to be formed. This effectively results in two parties – the governing party and the opposition. There can be a change of parties through free elections that are not fixed to any great extent. There is freedom of speech and individual rights, as well as a social contract.

One of the hallmarks of the metasystematic stage is that all persons have equal standing. One considers fairness from the perspective of the least advantaged (Rawls, 1971Rawls, 1971). At this stage, issues of nationalism, and cultural preference are overridden by a respect for every individual. Because of this, the legal, economic and political systems work to further reduce corruption and expand fair competition. The mechanism is that less corrupt producers have lower prices and, therefore, increase their chances against more corrupt competitors. As prices fall, the buying power of most everyone is increased. This particularly benefits the poor who often are considered the least advantaged. Investment is high because the economic and political systems are relativity stable without much of a guiding hand (the expectation is the central banks). Productivity is also extremely high. This is because the manipulation of information replaces the manipulation of materials by hand. Services expand over manufacturing because education and innovation in competitive modern societies makes labor elsewhere cheaper. The less developed economies must depend on the advanced ones for knowledge, innovation, etc. When agriculture is reduced to 5% of the economy, educational demands escalate to overwhelm supply (Kegan, 1998Kegan, 1998). This should be a generalized trend that will occur in all societies at this stage. As the countries of the world move into the metasystematic stage, trade barriers are eliminated so that people and groups can compete on more equal footing, regardless of where they are. This is extremely hard to achieve because it is difficult to go against local interest groups and nationalism, but it increases productivity and, thereby, reduces costs. Incomes go up where labor is less expensive and those economies grow. There is increased demand for products and services that only the most advanced economies produce. Therefore, the world markets unify to a great degree. The transmission, storage, and processing of information is computerized and increasingly distributed on the World Wide Web. Email lists provide the exact intensive form for building metasystems and communicating them to others. The society increasingly stratifies as to attained education and competence in communication. People all around the world develop multiple systems for accomplishing these activities. This hugely affects the transition to metasystematic stage thinking because so many metasystems appear and are explained relatively well. Rough comparisons are made among these systems, which is characteristic of the transition to the metasystematic stage.

As previously mentioned, the governmental regulations placed on free speech in a country are highly indicative of the stage at which the government is operating. In order to gain a better understanding of operation at the systematic stage, it would be useful to consider the governmental practices of the United States in this domain. Here, regulation is most often used to protect the system. Although the US avows in the Constitution to grant its people free speech, there are still limitations on this right. For example, the US allows free speech only as long as it is truthful, peaceful, and within the realms of morality. Therefore, in order to broadcast publicly, it is required that an individual or group obtain a license. Unlike China and Afghanistan, however, there are very few restrictions on use of the web. This has led most broadcast in the US to move to the internet, where no license is required and very few limitations apply. However, the right to privacy prevails over the right to free speech in this case. For example, people in the US have the right to block spammers, who argue that they are exercising their right to free speech. In essence, this is a restriction on free speech in one particular population, in order to protect those that are the targets of this practice.   This is also the case with restrictions on child pornography, which the Supreme Court banned from the internet. This decision was based on the fact that the production of these films is harmful and abusive to

children. These examples illustrate the fact that the US employs restrictions on civil rights and public broadcast mainly to protect the system and its members. This is highly characteristic of operation at the systematic stage, with the potential to transition upward.

Although the US is one of the most highly developed countries in the world, there is still room to progress developmentally. A main goal of a society might be to reach the metasystematic stage in politics and economics, where there would be no need for governmental regulation of public broadcast content. In order to achieve this, a well-functioning democracy with layers of reinforcement contingencies is essential. This means that there must be public openness and individual relationships between members of each of the organizational hierarchies (among the audience, the broadcasters, the stockholders, for example). This would allow for development of all those involved, which would, in turn, create a society that functions through interaction and mutual benefit, rather than parasitism.

Furthermore, consider the relationship between the United States and North Korea. Hope for useful dialogue between the two depends on the possibility of change in developmental stage of political atmosphere and action on both sides. The US has to be able to take the perspective of the North Korean leaders. Taking their perspective means understanding the historical and current background that inspires their ideology and promotes their recruiting and support, identifying the specific circumstances that are likely to evoke terror attacks, and anticipating the effects of our actions. The US is slowing beginning to see that tit-for-tat is not workable in the Mideast, as seen by the violent retaliation as in Israel. It could be argued that the ability of the US to take an adversary's perspective is related to its political and economic development. It may be that the only way it can change, however, is with help from the outside.

In the 20th century, the United States regularly interfered with the affairs of other countries. It did so by supporting various groups within those countries, many of which either terrorized the populations as many of the dictators did supporting coups and insurrections. When the attacks touch us or our allies, we term them "terroristic." More recently, since the fall of the Soviet Union, the US also has largely gone out of the terrorist business. Likewise, the Western world has to help provide the means and alternative routes for terrorists for their legitimate goals. In Afghanistan, the Westerners are providing the Warlord would-be-terrorist with alternatives, rather than attempting to exterminate them. This requires the Westerners to take their perspective and, in effect, co-opt them. For example, the Roman Empire staved off armed uprisings by bringing leaders of conquered tribes into the apparatus of empire. A terrorist group's willingness to consider alternatives is evidence of something like stage change, although it might have more to do with the blend of engagement and coercion used by governmental powers.

One overall solution is to help all of the world develop economically. In relation to democracy and capitalism, it might be argued that terrorist movements do thrive in advanced democratic capitalist nations. This might suggest that the modern countries should help remake the world in their own image, as proposed by Rumsfeld and Wolfowitz. However, this may not be a good idea until a country is somewhat close to reaching the metasystematic stage. At that stage, the least advantaged in the society find the government actions fair. Many Western countries are called democratic, but barely perform at the systematic stage. They surely do not co-construct a perspective from which to judge fairness with the people within that are alienated from them. In the US, gangs represent urban terrorists to some extent. The Basque separatist group ETA in Spain (after Franco), Action Directe in France, the Red Army Faction in Germany, and the Red Brigades in Italy may not be thriving but certainly have had major disruptive effects in their advanced home countries.

Therapy Stage 12 Metasystematic-Step 4 (0)

Participant: "To find things easily is to pursue a thought until it intersects perceptions or images of the misplaced item, to sense its presence without clearly identifying it and then it appears as if to fulfill some sense of it being there already."

Analysis: The adult integrates "locating" and "identifying" into a subjective, intuitive system of thinking about an object. This is a strategy of "scanning and zeroing in" on the misplaced item. In this process, the adult first thinks about an item, which elicits perceptions or images of it. Then, the adult implies that he looks around for the item. The scanning is done by first using the "ground" to sense an object intuitively, and then by disembodying the object more fully so it becomes the "figure. " At this point, the appearance of the object is gradually matched against the images of the thought about the object until the client becomes fully conscious of the object's presence. At the end of his explanation, the client is just starting to construct the related system of objective appearances and

locations. The variables of thinking about, locating, and identifying a misplaced item are fully co-ordinated into a strategy for finding misplaced items. When looking about, he first senses the item's presence without fully identifying it. At the end of the process, the item is fully located and identified, confirming the adult's "sense" of the item's location.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: It's important because in almost all aspects of the society where people are involved day by day, the professional business bureaucratic demands upon people--let us say for the moment, relatively educated people in the entirely conventional sense of having gotten a certain number of degrees or something--are such that they neither make nor are given the time and I think soon lose the energy to find the time to think critically of what they are doing and learn a variety of ways to absorb the mainstream lessons of their society or to work within the alternatives that the society considers respectable and suitable alternatives, as whatever, as the Democrats and the Republicans or between this college or that, or this or that job, whatever it might be. So that there are few institutions which have the luxury as it were, or the capacity to get people to think outside the context of any one pursuit and to think about themselves and their society better with that extent distanced.

Analysis: Pass at Metasystematic Stage 12. The participant clearly defines her/his ideal system of a moral education with a definitive goal of integrating the self-system with society, although this goal should be accomplished along with the student receiving a practical skill. The participant passes at Stage 12 because they are able to describe a system which has a clearly defined method integrating these two goals– " ideally the institutions should make one competent to work within the profession and it's too obvious to mention when you get to areas like surgery or building bridges, but the notion of competence for the law is far more complex, but there is clearly a sense of an ability to deal with the materials to grasp and to understand their various possibilities and so on. On the other hand, simply to train people to that competence which would enable them to play the professional role and serve any set of interests, which in my mind would be an inadequate way of thinking of the role of the school as such, that is, it should have the role of making the student not only aware of the professional tradition, but critical of the professional tradition.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: Whereas if you stay within a narrow conception of technique and professionalism---which inevitably, you do, in any professional school. If you're studying the bone structure of the body, you don't want to develop the forms of democratic government necessarily in the same course. But a school that offered no opportunity to see what it was doing relationally, too, in the sense of what life the individual ought to lead or the understanding of the character of your own society. What I think failed by making the professional think that professionalism and work consisted of the boundaries where the boundaries or the boundaries of technique taught in the school. There were no larger issues present.

Analysis: Pass at Metasystematic Stage 12. Participant successfully describes a cohesive system with sharply defined criteria for what determines a good or bad education. Participant successfully integrates the goal of professional competence with the goal of broadening the professional student's understanding of his/her role in society.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: All are theories that rest upon different ethical assumptions of what society is and what the role of law and society is and what either has achieved which often blends into what people think it ought to achieve and people create their histories which are open to many interpretations which often, you know, consist of the way they think of what the society ought to be. So it's just become a prevalent way of thinking about law. To understand why the rule says one thing rather than another or the standard or the principle or why the Constitution or whatever interprets it to mean this rather than can't be understood with any strict system that extrudes history, morals, political theory, even psychology, sociology, a whole variety of perceptions that inform the lawmaker, whether you're talking with a judge or a legislator.

Analysis: Pass at Metasystematic Stage 12. Participant successfully describes a cohesive system with sharply defined criteria for what determines a good or bad legal education. Participant successfully integrates the goal of legal competence with the goal of broadening the law student's understanding of his/her role in society.

Good Government Stage 12 Metasystematic, Step 0 (4)

Participant: I mean there's a sense in which we respect ourselves more and respect each other to the extent we are self-governing rather than taking orders. Um. There is a sense a purely efficiency sense in which you tend to keep the most corrupt and most venal and most crooked out of office---at least you can bounce them from office if there's some conception of electoral or democratic control as opposed to having no control over the guys. And there's a conception of self-development through, you know, not thinking what your life can be entirely your business and private and other people are going to run the joint so as you start to participate and you start to think more of the polity and we start to think more the society you're living and ideally, we take that as part of your responsibility to think about others who think about the society and not simply say, my domain is entirely my life. Analysis: Pass at Metasystematic Stage 12. Participant successfully describes a cohesive governmental system with sharply defined criteria for what determines a good government. Participant successfully integrates the goal of legal competence with the goal of self-development and the citizen's responsibility to society.

Good Government Stage 12 Metasystematic, Step 0 (4)
Participant: That denied people important possibilities of participation that dictated rather than saw itself in some fashion of the community of the people themselves that did evil things, that denied respect, that humiliated, that discriminated…
Interviewer: Why would that be evil?
Participant: Well, you're back to fundamental, I mean, formal premises intuitively because it would create systemic official differences, discriminations among people in a way that denied to them, denied some basic notion of equal worth… you ask why say that, why not some more than others and in many respects, some are better than others. Morally, or in talents or in one thing or another. But in modern terms of respect as human beings which they inherit so that would deny that, would I think true to some, hierarchically, traumatically whatever superior to others. And deny participation to all or some and to deny respect by crushing all of those possibilities of human expression or discovery or gaining more freedom that we talked about earlier.

Analysis: Pass at Metasystematic Stage 12. Participant describes a system which has sharply defines a bad versus and good government. Participant successfully integrates the two themes of superiority in some individuals with the theme of equal respect .

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: I'm not certain that I would want some veto power but it would probably be on the grounds similar to Constitutional grounds vetoing what Congress does. If it violates fundamental principles. So I'm unclear what the relationship between the president and the faculty should be, but it would move more heavily towards faculty participant to very few restraints and faculty participation going toward a great voice whether or not it would fully [allow] election of the dean and faculty committees and things of that sort. But I think the president is functioning. I think the faculty could get all locked up. They could all become one thing and refuse to hire anyone outside who's not part of that model. Or they could develop vendettas and become very destructive and drive people out on personal or ideological grounds… It would become a closed institution rather than an open institution. And I think part of the role of the president might be to assure that a university remains, not equally open to everything, but remains an institution in which ideas have a chance to develop and there's no formal closure to any of the competing the set of ways of thinking about a participant.

Analysis: Pass at Metasystematic Stage 12. Participant describes a system which has sharply defines a bad versus and good university government. Participant successfully integrates the two themes of openness with the theme of structure.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: If you believe in what an institution should be, then you should act for it. Because there's a problem when you're hierarchically in the administration under someone's dean for a lot of reasons I don't someone at MIT who's going to be publicly criticizing me. Fax friend Peter. I want someone's who's supporting me. That's my team. I gotta get things done. Gotta count on you. But a faculty member's not anyone's team. A faculty member is an independent functioning human being. It has a responsibility, I think, certainly the right, whether or not if they have the responsibility, to act in that way… If I were vice-president or something of the sort. In an important way. I

wouldn't stop criticizing, but I'd do it internally more than externally.

Analysis: Pass at Metasystematic Stage 12. Participant successfully describes an ideal system of university government which integrates the goals of supporting the institution and being a responsible critic of same.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: The reasons for it may lie in the subconscious, but at least we all know, it's---you know you're lying. I think that you deny your respect for me. You know, that really bothers me. I: Why? S: You're manipulating me. You're not treating me as someone real. And you may be doing it – if you've got a point to fight out on the university paper, I think that you learn early in life that you do it directly. You don't get around it by lying. You say, Mr. Administrator, thanks, but no thanks or yes, I will bow to pressure if you don't want it published. Rest assured, I'm a goody, I'm not. If your superiors lie to you. That's why the whole idea of censoring the thing is bad. You learn that when you're in authority, you're going to crush someone who threatens to reveal something that's embarrassing to you. Going to publish. Or you say, keep your hands off our papers, if you try to censor this at all, we're going to be responsible, or we're going to try to be or whatever you're going to try to say.

Analysis: Pass at Metasystematic Stage 12. Participant correctly rejects lying, particularly by those in authority, as inconsistent with an ideal university system based on respect and responsibility.

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: Although the university, I think did seem to be acting abusively-the way you put I – around the facts that I've imagined. If it were anything more than inquiry and urging you to take great care with this story and assure that it's correct if there going to publish it and to think hard about it. Stonewall? I think it's a bad way to get out things. It's a hard way to get out of things. You… it's a very… and you're teaching a lesson by doing that."

Analysis: Pass at Metasystematic Stage 12. Participant correctly rejects lying, particularly by those in authority, as inconsistent with an ideal system of morality based on truth – "

Good Education Stage 12 Metasystematic, Step 0 (4)

Participant: if it passes for acceptable for personal authority is able then, to denigrate particular constituents. If the uneducated, the poor, the minorities, women, whatever he wants to do. So that if it passes in the classroom, it's, uh, you know. It's like, um, whatever, um,… a president of this country denigrating a particular other people's for this or that or denigrating all Communists or whatever. I: Ok S: Whatever it might be. Or a Palestinian denigrating all Jews or an Israeli leader denigrating all Palestinians. It legitimates that fine dilemma. I:
Interviewer: Why?
Participant: Because it's from a person in a position of authority.
Interviewer: Why is that important – that he's in authority.
Participant: The legitimation because when people with formal authority speak others listen more than they do to someone they can dismiss down the street and that person gains an audience and the press has a lot more power to disseminate and you may have the power, even more significant, to write your views into some form of official conduct by your policies in the classroom.

Analysis: Pass at Metasystematic Stage 12. Participant correctly rejects denigration and lack of respect, particularly by those in authority, as inconsistent with promoting and supporting an ideal system of morality based on truth.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Participant: Like you could maybe go to jail for stealing, you know. That's a little bit like civil disobedience and Thoreau and so on, not quite the same thing, but you're standing up for the principle which human life is more important on this particular equation more than property and are willing to take the consequences even if it means that you're going to jail… And I think that this notion of say being willing to take the consequences, if there are, such there are social consequences for, and the willingness to make the reparation to the druggist. I mean, there's the problem of an unjust price, in this situation, there are so many complex moral issues—There are many ways in which you could express your willingness to comport with a social system and still not outrage you in various ways.

Analysis: Pass at metasystematic Stage 12. Participant successfully describes an ideal system of morality with preservation of life over property in a hierarchal value system, but integrates this theme with the theme of preserving social order.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Unless you say that this is an idiosyncratic occasion. I mean, it's never going to happen again and you've got the whole human tragedy there and it's not going to hurt you to give and I suppose that I would feel in that circumstance, I'd consume all of that, yes. I should give. I can't bear the responsibility for not doing it. But I'd also feel a great rage. Why am I doing it in my society? Why am I called upon? Why shouldn't the society be doing it in some structured way? Through tax systems, welfare systems, whatever it might be. And I find it hard to believe that this would be that isolated case, you see.

Analysis: Pass at Metasystematic Stage 12 – Participant describes an ideal system which would meet peoples' needs in emergencies rather than relying on the unpredictable and haphazard intervention of individuals, contrasting this ideal system with one that places an unreasonable and sometimes impossible burden on any particular individual who may be confronted with such situations.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Participant: The market is not functioning by definition when you're price-gouging and since most justification for prices rests on some assumed structure of competitiveness applying demand and if you don't like my drug prices, go to someone else, if you don't like my towing service in the road, go to someone else. All of that collapses when you're broken down on the road and I'm the only towing company that's willing to come out and get you for a thousand bucks and you're the only person with this rating on them – that's all. We're talking about what an economist would call a monopolist situation and monopoly pricing raises serious issues with respect to the public good. Why give one person all that power to profit self at the expense of much public suffering in this situation elsewhere?

Analysis: Pass at Metasystematic Stage 12 – Participant describes an ideal economic system devoted to the public good, and correctly rejects any monopolistic system as being inconsistent with such a system.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Participant: Entrepreneurial skill, running out of the game, taking a risk, all of those seem, simply on a utilitarian basis, which I would come back to the diminution of welfare to the druggist seems to be a relatively trivial matter if you were still allowing some normal business and profit compared with the enormous harm you're creating for others. If people try to justify this out of ignorance, you have whole elaborate attempts at social or political theory that been to justify one or another set of arrangements. I think where you're dealing with, particularly in matters like health which hurt you very strongly, life and death, it seems to go back to some fundamental lack of respect or any perception of equal humanity to allow one person to appropriate so much that could be helping so many others in a vital way

Analysis: Pass at Metasystematic Stage 12. The participant describes an ideal economic system that places life and health over promoting entrepreneurial skill and risk-taking.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Participant: He should repent and embrace him like a brother…well, he should certainly try to understand why Heinz is doing this. I suppose that would be…or Heinz should try to get him to understand why he is doing this… there's always the possibility that he will understand Heinz's. . the death of Heinz's motivations and see why Heinz used this as a moral act and perhaps that point of view may be persuasive to him. He can empathize with Heinz to some degree and see it as he would if it were his wife and if he didn't have the money then he may rethink the morality of his own conduct and wonder if he should not act differently in the circumstances… Ideally, I mean,… what I'm stressing is that it would be best if we had a character that would empathetically identify with and see the dilemma and think it through by feeling and understanding the thing rather than someone who saw it clearly in terms of property rights and property right protection.
Analysis: Pass at Metasystematic Stage 12 – The participant describes an ideal personal moral system for the

druggist based on empathy and placing life over property.
Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

What right has the stranger to say Heinz, you lower your welfare by participanting yourself to a prison sentence by stealing this drug to me. I think relationships here are vitally important the way we understand our moral responsibilities. We have to – either, I think they are personal and individual through love or affect or one or another close, or they are systemic and social. Handling the social problem as a whole. I find it very hard to work out the moral in between. Between the, you know, two, four, eight, twenty, whatever they are, people who would be within our intimate circle and the millions and millions and millions who might be making claims on us.
Analysis: Pass at Metasystem Stage 12. Participant describes an ideal system which would integrate the two themes of personal and social responsibility.

Moral Reasoning Stage 12 Metasystematic, Step 0 (4)

Participant: The doctor inevitably gives part of his welfare to patients maybe by subjecting self to disease by working with a communicable disease pairing. That's part of the effort of helping. Suppose the doctor simply asks for the four thousand dollars to pay for the drug. It's hard for me again to see why individually, this doctor is under this responsibility with this person and why not the same responsibility to every other poor patient who comes in. I think the doctor is under an obligation, I would say, to work toward some system which will make it possible for the people he's seeing to have a possibility of getting these jobs or getting help. And again, I don't think that he has to expose his whole welfare and bankbook and family or whatever, to the demands of individual patients. And I wouldn't know again where it stopped. to I think that there are limits to what his sense of responsibility is.
Analysis: Pass at Metasystematic Stage 12 – The participant describes an ideal system integrating the doctors' personal moral responsibility for providing some of her/his patients with free services with the general responsibility of society for providing medical treatment for all.

Societal Stages. Metasystematic stage 12

In general, the metasystematic stage is defined by actions that create metasystems out of systems, compare systems and systematic stage perspectives, and name properties of systems (e.g. homomorphic, isomorphic, complete or incomplete, consistent or inconsistent, commensurable). The end result is that metasystems and metasystems are formed out of systems of relationships. At this stage, our analysis suggests that governments should move beyond the conceptualization of the legal system based on the simple use of a combination of Logic and Folk Psychology. Legislators, judges, and administrators have a great tendency to view the problems of government based on their own experience. Their own experiences are then projected onto others in a logical, but non-empirical or scientific manner. The use of folk psychology prevents them from effectively dealing with both internal and international affairs in obvious ways. Folk psychology leads them to fail to understand the huge individual differences among people, and they still base their thinking on the idea that everyone has freewill and will respond as they assume they would to inducements and threats. They assume a common value system or if there is a difference in value systems, the system of the legislators or government officials is "right" and that of the others is "wrong."

There are a number of metasystematic political systems, all of which are incomplete and inconsistent. For example, many of the considerations in the US Bill of Rights and the Constitution together form a metasystematic system. There is a coordination of the system of rights under the Bill of Rights and duties in the Constitution. Also consider the Declaration of Independence and the concepts and principals embedded in the European Union (EU).

Societal Stages. Metasystematic stage 12: Transition to Paradigmatic stage 13

Acting at the metasystematic stage requires taking the perspective of the opposition and acting toward them in a non-strategic way, regardless of the stage at which they operate. The fact that people in the modern countries have such difficulty in doing so, is evidence that we are not fully functioning at this stage. Most of the time we are not forced to function at this stage, because we can apply existing laws to situations, without ever leaving the political system to which we belong. We also can use power to get our way in the world and even within society. The use of power is strategic, showing that we are further from operating at the paradigmatic stage. Yet, once a group or society begins to practice operating at the metasystematic stage and can effectively take the perspective of the opposition, the next step is to incorporate them into the co-construction process. Again, this allows for all participants to become owners of the co-constructed super-system. In order to attain the paradigmatic stage of

development, it is crucial that a group or society first masters all the aspects of the metasystematic stage and then transitions into co-construction. According to Ross (personal communication) we can design and implement metasystematic methods and processes that equip people at all scales, from local to global, with the procedural mechanisms for more complex co-constructive thinking generated by their collective levels of engagement.

At the metasystematic stage and paradigmatic stage, it becomes clearer that a possible solution is to bring people into the larger society, giving them a voice, rather than pushing them out. For example, one might have invited Saddam Hussein to the UN to speak and acknowledged the good things that he had done. Also, giving him responsibilities in which he had to work as a part of a very small public group to protect civil rights and liberties and institute democracy may have changed the way he behaved at home.

Also, consider the conflict between the developed world versus Al-Qaeda and their allies. The developed world operates at the systematic to metasystematic stage, and Al-Qaeda and its allies operate at some amalgam of concrete through formal stage in the arena of governmental stage as discussed above. There is also evidence that some of the members such as Mohamed Atta functioned at the systematic stage in some arenas, such as engineering.

Atta studied architecture in the Engineering Faculty at Cairo University. According to his peers, he is an average student. Atta also studied in Hamburg at the Technical University of Hamburg-Harburg (TUHH). He enrolled in a degree program in urban planning in the faculty of engineering. Most often, postgraduate degrees are associated with the systematic stage. This further illustrates the notion that a variety of developmental stages may be present in a single governmental system, and that the successful integration of all the members operating at these different stages would allow for transition to a more complex stage. However, the fact that we, in the developed world have not attempted to engage Al-Qaeda to co-construct its members and people of the developed world may be one reason underlying its lack of developmental progression.

Societal Stages. Paradigmatic stage 13

As developmental stage increases, the number of societies that operate at that stage decreases. The paradigmatic stage, for example, has yet to be reached by a single society in today's world. In general, this stage is defined by fitting metasystems together to form new paradigms. But this is not always possible to do simply, so processes that make partial synthesis possible are developed. At this stage, governmental and societal issues are addressed through co-construction (Sonnert & Commons, 1994 Sonnert & Commons, 1994). The impossibility of finding a complete and consistent set of governing principles forces this solution. Madison, in drafting the US Constitution, was aware of the need to balance the incommensurate and potentially conflictual systems of administration, legislation and justice. But the means to adopt a process beyond a weak political structural one, is such a difficult task that no government has been able to do it, let alone address the need to do so.

The potential for a paradigmatic stage in political development arises out of the dashing unbounded optimism of the modern period first by cracks in the fabric of math, logic, and physics. Heisenberg's (Price, Chissick, & Heisenberg, 1977Price, Chissick, & Heisenberg, 1977) uncertainty principle, particle-wave duality, and Godël's (1931 Godël's (1931) incompleteness theorem made it clear that the hope of a complete mathematics, in which a proper set of axioms would lead to all mathematical truths, was premature. Attempts to integrate Einstein's general theory of relativity with Planck's quantum mechanics have failed so far. Systems of observation, such as particle-wave duality, were seen to be ultimately inconsistent. Limits to scientific inquiry were proposed (Holton, 1978, 1979 Holton, 1978, 1979). It is important to note that awareness of the limits to scientific inquiry has lead to awareness of the limits of government.

Paradigmatic actions transcend the abstraction of the individual at the metasystematic stage, in which there is an abstract concept of society that does not face the structural dynamics and limitations of such conceptions. Such limitations are illustrated by Arrow's (1951Arrow's (1951) welfare theorem, Plott's (1967, 1971 Plott's (1967, 1971; Plott & Levine, 1978 Plott & Levine, 1978) voting dilemmas, and Hardin's (1968 Hardin's (1968) tragedy of the commons. Extensions of theories and fields led to this non-computability notions. In Arrow's welfare theorem, he showed that a pie could not be fairly divided among three people. This had ramifications for voting systems. No voting system has been found to be complete and adequate. This is because there is more than one metasystem describing voting, each including different sets of desirable properties found in each metasystem. And no rational political scientist can non-arbitrarily determine that a particular (internally consistent) voting metasystem is best. Thus, the voting dilemma, as well as Arrow's and Hardin's dilemmas, illustrates that "monologic" attempts at solving it are either complete but inconsistent or consistent but incomplete and arbitrarily selective.

In the social domains, such as politics, morality, and conceptions of the good, paradigmatic actions are based on the co-construction of an acceptable shared set of precepts. Thus, even enemies must be brought into the co-construction process. One positive side-effect of such co-construction, is the participants become owners of the co-constructed metasystems. This is similar to the lower stage action of forming of an alliance with the "healthy" part of a person so that a mutual set of positive goals may be pursued. The concept of healthy and unhealthy parts of a person at this stage is replaced with one's preferences as a stakeholder.

Consider the example of two metasystems of capitalistic market economics and social welfare economics. Each of these metasystems is inconsistent with the other. Market economics does not protect individuals, nor companies, from fair competition. Social welfare economics uses transfers of wealth to compensate for differences in competitiveness, thereby, reducing the effects of competition. For example, welfare economics provides disability benefits for the severely impaired. That the paradigmatic stage, the question is how to consider the issue of how to assimilate people of differing abilities into a united, functioning whole. This is a problem that every society is faced with, yet the approach taken to formulate a solution is what characterizes their developmental stage. Upon addressing this issue, the question of equity versus equality inevitably arises. Equity states that all people are granted with equal opportunities, yet there is recognition of differences between individuals. A society that subscribes to this belief allows all people to reach their potential, but does not solve the issue of severely impaired individuals.

In many societies, there has been the institution of financial "disincentives" for these people. For example, the availability of welfare and disability pay allows people to not have to work for their money. In essence, this attempt at equity is a paradoxical breech of equality for those who *do* work for their money. There is a similar problem in many Scandinavian countries, where child support laws have probably led to increased instances of unwed mothers. These laws reinforce the notion that a mother does not have to depend on a husband to be able to support children. From within the framework of social welfare economics, there is the question of what would happen to these children if the support was not available.

It is this issue of conflicting claims that separates a metasystematic societies from the paradigmatic ones to come. In order to address these issues, such a society would hold open discussions, in which the opinions of people at all developmental stages were honored. This would allow for a consistent solution to a particular problem and an effective integration of all members of the society. There would be no jockeying for removal of policies or laws from the system, but only co-construction of solutions (Ross, 2002 Ross, 2002). Once a society has achieved this ability, it is said to operate at the paradigmatic stage. This is the primary goal for those operating at the metasystematic stage and lower. When the public discourse is extended in time, has real power, is inclusive, and establishes its own rules and agenda, and when it engages in real co-construction of its rules, agenda and prioritization of assumptions, then the discourse may be paradigmatic.

Table 5
Nicholas Commons-Miller Stages of non-religious thinking. Tuesday, November 1, 2005

Stage	Statement
Concrete	*Explain your religious beliefs. In your explanation please try and state what your core beliefs are and why you think you hold those beliefs.* God is a supreme being who created us and who rules over us. Heaven exists and in order for us to enter in, Jesus died for us. I believe this: a) because my dad does [Concrete: Reason is a personal authority]
Abstract	*Should he steal the drug?* P101. Yes he should steal the drug. Because his wife's life is worth more than going along with a greedy man's rules. There is no logic, just assertion P100 Yes he should steal the drug. A life is more important than money any day. Heinz most likely loves his wife and if he has exhausted all other possibilities for raising money he should steal it. It won't save the druggist (hard to read that phrase) and the druggist will be out only $1000. There is no logic, just assertion –" you can't put a price on life, as in 4" *Same participants views on atheism:* Atheism means you don't believe in a God or religious institution and that you don't need religion to keep yourself sane. Abstract. Does not say why. This is implied relativism Step 2 to formal. One could be sane with or without god. *To what extent do they represent your personal beliefs?* I feel atheists is too strong a label for me - I don't believe in god myself, but I don't discount the believe in god that others hold. [Abstract: No explanations. Everything is socially normative, You believe in what you want, and I believe in what I want – relativism at the abstract stage. Transitional step 2 to formal.] *Views on atheism*: Atheism means you don't believe in a God or religious institution and that you don't need religion to keep yourself sane. Abstract. Does not say why. This is implied relativism Step 2 to formal. One could be sane with or without god. *To what extent do they represent your personal beliefs?* Being an atheist helps to keep my strong in my belief in myself. I feel that religion is something some people need to find meaning in their lives. I believe I have enough belief in myself that I don't need a God or religion to make my life worthwhile. Abstract. Does not say why *Should he steal the drug?* P 101. Yes he should steal the drug. Because his wife's life is worth more than going along with a greedy man's rules.
Formal	*To what extent do they represent your personal beliefs?* Being an atheist helps to keep my strong in my belief in myself. I feel that religion is something some people need to find meaning in their lives. I believe I have enough belief in myself that I don't need a God or religion to make my life worthwhile. *What logic or evidence supports those views?* Goes does not exist. It does not make sense. I have lots of evidence, no space. Formal [If there were a god, it would make sense. It does not. Therefore there is no god.] *What logic or evidence supports those views?* Learning more about both science and religion as well as philosophy. [Formal Step 3 to Systematic Learning about science – a system --and religion -- a system -- and philosophy – a system. There is no resolution, just progress towards.]

| Systematic | P101 *At what age did you first begin to give up your belief in God if you ever had one?* 13 *What were the circumstances?* I read the bible. It was completely random. How could they possibly believe this? Are you serious? Systematic [If there were a god, the bible would not be random. If the bible were from god, it would be organized. But it is random] P111. If H's wife knows he is stealing the drug... she should not say anything. Because her life is on the line and depends on the drug. If he breaks in...she should allow him - because of utilitarianism. This is a systematic stage sentence, utilitarianism is a system *Explain your religious beliefs. In your explanation please try and state what your core beliefs are and why you think you hold those beliefs.* God is a supreme being who created us and who rules over us. Heaven exists and in order for us to enter in, Jesus died for us. I believe this: b) because any explanation about how the universe was created lends itself to the presence of a God. [Systematic: Because any "explanation about how the universe was created" The universe is a system. *How do you square your religious beliefs with your scientific ones?* Much of the story of creation I take as an allegory for why there's original sin. Systematic: An analysis reflecting on the form of a story. *How do you square your religious beliefs with your scientific ones?* Science is used as a tool to further advance my personal religious beliefs since it allows me to understand nature and the extent of god's creations. This is not a strictly Creationist of Darwinian fight but in terms of religious creation and authority even the scientific ideals of a society can advance. The use of science to pursue moral good, increase understanding. Systematic: Two sets of relations are compared, Understanding nature (relation 1) lets me understand god's creations (relations 2, ..., k) *At what age did you first begin to give up your belief in God if you ever had one?* 13 *What were the circumstances?* I read the bible. It was completely random. How could they possibly believe this? Are you serious? Systematic [If there were a god, the bible would not be random. If the bible were from god, it would be organized. But it is random] *Views on atheism:* I am simply not religious. I am convinced the empiricism is the most defensible epistemology to ascribe to. Dogma is indefensible. Systematic: Comments on which system is preferable. *To what extent does atheism represent your personal beliefs?* Somewhat. *What logic or evidence supports those views?* Science. I have yet to see any proof that a god truly exists. [Systematic – requires proof, which is a property of relations that are analytically or empirically true] |

Meta-systematic	*Is it important for people to do everything they can to save a life?*
	P101 Yes, we are all the same and it would be what you want for yourself in that situation.
	What logic or evidence supports those views [on Atheism]?
	Can't prove a negative, however never heard a convincing argument for a given religion and (incoherent) to endorse everything that can't be proven (to be?)
	[Metasystematic: Cannot prove non-existence. There is no evidence for non existence. There could only be evidence of existence of anything] This is probably metasystematic
	What logic or evidence supports those views [on Atheism]?
	The logic that truth statements ought to be based on observable or other derivable facts, not prophets, scripture, or other such dogma
	Metasystematic. Compares 2 systems to 1, observables, and derivables versus dogma
	Views on atheism:
	belief that there is no god (definite statement)
	To what extent do they represent your personal beliefs?
	Very close. However I don't think you can prove nonexistence.
	[Metasystematic - A Property of testing the empirical existence of something is that one cannot show non- existence only the failure to find existence.
	What logic or evidence supports those views?
	There is no evidence of the existence of god, or plausible theory of existence of god. It there is a god s/he has ensured no basis for belief therefore belief in god in unecessary. It is extremely unlikel that there is in fact a god. To date, attempts to 'prove' the existence of god are unconvincing, unscientific or flawed.
	[Metasystematic - A Property of testing the empirical existence of something is that one cannot show non- existence only the failure to find existence.
	Views on atheism:
	It simply does not involve belief in a personal "god"
	To what extent do they represent your personal beliefs?
	Who, Atheists? Depends upon how atheists define themselves. My view is consistent with # 1, but others may see it as compatible with an agnostic perspective.
	What logic or evidence supports those views?
	No evidence for/against.
	Not an empirical question.
	It is hard to logically conclude that there is a "personal god."
	Metasystematic. Many properties of the system of agnostic and the atheist system. Belief is "not an empirical question"

Example 1: Abstract stage 9

[Subject 100: HRP]

Should Heinz steal the drug? Yes

A life is more important than money any day. Heinz most likely loves his wife and if he has exhausted all other possibilities for raising money he should steal it. It won't save the druggist (hard to read that phrase) and the druggist will be out only $1000

Should the pharmacist give the drug to Heinz? Yes

You can't put a price on life and hopefully the druggist should realize that

What should the pharmacist do if he catches Heinz?

Nothing. [*Why?* - because you can't put a price on life, as in 4]

MLC: All of this is abstract stage. There is no logic, just assertion –" you can't put a price on life, as in 4"

If Heinz's wife dies because she did not get the drug is the pharmacist responsible? Yes.

Because he didn't give her the drug

If Heinz' wife knew he is thinking about taking the drug, what should she do? Nothing, because it could save her life.

If Heinz doesn't love his wife, should he steal the drug for her? Yes.

He's married to her, if he doesn't love her he still has a duty to save her life.

Suppose the person is a stranger....? Yes

See answer to question 4 (you can't put a price on life)

Should Heinz steal for animal? Yes

If he really loves the animal. I doubt the animal is that important to him

Is it important for people to do everything they can to save another's life? Yes

Because once someone is dead there is a lot of potential that is lost. No one should die if it is avoidable

Should people do everything to obey the law? Yes - but not when it is a life or death matter. Heinz is trying to save his wife's life. He should do whatever he can.

Example 2: Abstract stage 9

[Subject 101]

Should Heinz steal the drug? Yes

Because his wife's life is worth more than going along with a greedy man's rules.

Should pharmacist give drug to Heinz? Yes

His wife is dying. $4000.00 is not worth a life and its either $1000 or nothing anyway

What should the pharmacist do if he catches Heinz breaking in? Hit himself.

Why? He's a jerk - should value saving a life more than himself and his material comfort

Should pharmacist report Heinz? No, pharmacist is a jerk

If wife dies is pharmacist responsible? Yes - he knew how to save someone's life but didn't. It's like watching someone get murdered and demand money for getting help

If Heinz's wife knows he is stealing the drug, what should she do? Feel relieved because he is going to save her life.

If he breaks in, what should she do? She should just be thankful that her life is about to be saved because she is about to live.

If Heinz doesn't love his wife, should he steal the drug for her? Yes, he still should save a human life.

Suppose it's a stranger? Yes, because a life is a life

Suppose for an animal he loves? Yes, also a life.

Is it important for people to do everything they can to save a life? Yes, we are all the same and it would be what you want for yourself in that situation.

What should the doctor do? The doctor should help get the medicine because Heinz's wife needs the medicine. This is because a life is at stake.

MLC: Abstract. Same reasons as above

Example 3: **Abstract stage 9, transition to Formal stage 10 [???]**

[Subject 110]

Should Heinz steal the drug? Yes.
The idea of an evil being committed to undo a greater evil is one of the classic moral dilemmas of all time. Heinz is indeed committing one lesser evil for the greater good of saving his wife's life.

Should pharmacist give drug to Heinz? Yes.
The pharmacist should give the drug to Heinz because it is [his] moral responsibility to save lives and to charge reasonably.

MLC: Assertion, Abstract

What should the pharmacist do if he catches Heinz breaking in? If the pharmacist catches Heinz breaking in, he should punish him for that. Because it would be the natural thing to punish someone for a crime and a sin such as stealing. Even though the doctor [pharmacist] has committed a sin by charging too much, Heinz needs to face punishment.

Should pharmacist report Heinz? [By the same argument] the pharmacist should report Heinz for breaking in.

If wife dies is pharmacist responsible? The pharmacist would be responsible because 'criminal negligence is a crime both legally and morally.'

If Heinz's wife knows he is stealing the drug, what should she do? If Heinz's wife knows he is stealing the drug, she should do 'nothing, allow him to save her life.' This is because she needs to allow her husband to save her own life to correct the injustice and immorality of the doctor [pharmacist].

MLC: Could be formal. Correct the injustice and immorality of the doctor by doing nothing to stop her husband – But even though the form is there, the substance is missing so it is all abstract stage assertions.

If he breaks in, what should she do? If he breaks in, she should call the police. Because he is going to break the law and commit a sin and he must be punished even though he is right.

If Heinz doesn't love his wife, should he steal the drug for her? Heinz should steal the drug if he doesn't love his wife because it is the moral and right thing to do to save as many lives as one person can possibly save.

Suppose it's a stranger? Heinz should steal the drug for a stranger because it is the correct moral thing to do for the man to save as many lives as he (or she) can

Suppose for an animal he loves? Heinz should steal the drug for a pet animal. Because to save and preserve life is a clear and present moral conception.

Is it important for people to do everything they can to save a life? It is important for people to do everything to save another's life, because it is the moral thing to do to save as many people as one can possibly during his/her lifetime for the sake of humanity and moral [positions? Can't read the writing]

What should the doctor do? [Note: this subject has confused the pharmacist and doctor throughout]: Give her the drug at a fair and reasonable price. Because he has a responsibility to preserve and defend life but also to profit reasonably from his work and not take advantage of any rare situation.

The doctor should try to convince the pharmacist to give the drug to Heinz's wife... Because it is his responsibility to preserve life and act in a moral fashion
Doctors, if pharmacist will not comply, should still get drugs with their own money and later collect from the patients, because they must, through all possibility save as much that can be possibly saved since that is moral and (conviction?) that is the ultimate test of morality that one must pass.

If wife dies, is the doctor responsible? If Heinz's wife dies because she did not get the drug then legally the doctor is

responsible since he is criminally negligent according to the law. It was also the moral thing to do

It is against the law for Heinz to steal - does that make it morally wrong? NO   Because it is the lesser evil to have a greater moral good even if it is against the law

Should people do everything to obey the law? People should not do everything they can to obey the law - they must disobey immoral laws.

How does this apply to Heinz? He must disobey and break the immoral law that prevents him from saving his wife's life or the life of others. He must break the law in order to save the moral intention of the law. Morally he must commit the lesser evil to create the greater moral good. He must also challenge the immoral druggist and overturn his evil intentions.

This last paragraph is formal: He must break the law in order to save the moral intention of the law.

Example 4:

[Subject 111]

Should Heinz steal the drug? Heinz should steal the drug - because H should care for his wife. The net benefit to society is greater than the loss. The pharmacist losses $400 while the man saves his wife's life, which economically places a value of millions of dollars.

MLC: This is at least form. The net benefit is a formal calculation

Should pharmacist give drug to Heinz? The pharmacist should give the drug to H, because net loss < net benefit (see above)

What should the pharmacist do if he catches Heinz breaking in? If the Pharmacist catches H breaking in, he should give him the drug, except force him to pay something. This is because net benefit > net loss to society as a whole

Should the pharmacist report Heinz? The pharmacist should not report Heinz, because net benefit > net loss

If wife dies is pharmacist responsible? The pharmacist is responsible if H's wife dies because he knowingly denied the drug and someone will die from it.

MLC: This is a formal sentence

If wife knows he's stealing the drug, what should she do? If H's wife knows he is stealing the drug... she should not say anything. Because her life is on the line and depends on the drug.

If he breaks in, what should she do? If he breaks in...she should allow him - because of utilitarianism.
This is a systematic stage sentence, utilitarianism is a system

If Heinz doesn't love his wife, should he steal the drug for her? If H does not love his wife...he should steal the drug for her, because net benefit > net loss.

Suppose it's a stranger? Same response for stealing the drug for a stranger

Suppose it's an animal he loves? As for an animal, the response is no because net benefit < net loss

Is it important for people to do everything they can to save a life? It is important for people to do everything they can to save someone's life, because net benefit > net loss.

What should the doctor do? The doctor should inform them of all the options to save her life and give them choices - because he shouldn't make decisions but leave it to H and his wife
This is a systematic stage sentence, Both the system of informing and consenting are there. There is no coordination between

The doctor should NOT try and convince the pharmacist because its not his responsibility to make the decision.

He also should not buy the drugs with his own money because it is not his responsibility (can't read the rest - something about ... the responds to get the drug for his wife?)

The doctor should discuss drug's possible ineffectiveness with H and his wife - more information is better the husband needs to make a decision with the most information possible

This has a systematic feel to it. It reflects on informed-consent
If wife dies, is the doctor responsible? The doctor is NOT responsible if the wife dies as a result of not having the drug because he did not make a decision to kill the wife

It is against the law for Heinz to steal - does that make it morally wrong? It is not morally evil for H to steal in this case, because good > evil

Should people do everything to obey the law? People should do everything they can to obey the law because the law is an (implementation?) Of morality.

How does this apply to Heinz? This does not apply to what H should do

Table 6 (Old Table 1)
Algebra

Order of Hierarchical Complexity	Name	Example
0	Calculatory	Simple Machine Arithmetic on 0's and 1's
1	Sensory or Motor	Either seeing circles, squares, etc. or instead, touching them. O #
2	Circular Sensory-Motor	Reaching and grasping a circle or square. O #
3	Sensory-Motor	A class of filled in squares may be formed # # # # #
4	Nominal	That class may be named, "Squares"
5	Sentential	The numbers, 1, 2, 3, 4, 5 may be said in order
6	Preoperational	The objects in row 5 may be counted. The last count called 5, five, cinco, etc * * * * *　　　　　# # # # # 　O O O O O　　　　# / "} Q
7	Primary	There are behaviors that act on such classes that we call simple arithmetic operations 　1 + 3　= 4 　5 + 15 = 20 　5(4)　= 20 　5(3)　= 15 　5(1)　=　5
8	Concrete	There are behaviors that order the simple arithmetic behaviors when multiplying a sum by a number. Such distributive behaviors require the simple arithmetic behavior as a prerequisite, not just a precursor $5(1 + 3) = 5(1) + 5(3) = 5 + 15 = 20$
9	Abstract	All the forms of five in the five rows in the example are equivalent in value, x = 5. Forming class based on abstract feature
10	Formal	The general left hand distributive relation is $x \times (y + z) = (x \times y) + (x \times z)$
11	Systematic	The right hand distribution law is not true for numbers or set but is true for propositions and $x + (y \times z) = (x + y) \times (x + z)$ $x \sqcup (y \sqcap z) = (x \sqcup y) \sqcap (x \sqcup z)$
12	Metasystematic	The system of propositional logic and elementary set theory are isomorphic 　$x \And (y \text{ or } z) = (x \And y) \text{ or } (x \And z)$ Logic 　$x (y \sqcup z) = (x \sqcap y) \sqcup (x \sqcap z)$ Sets 　T(False)　φ　Empty set 　T(True)　Ω　Universal set

Table 7(Old Table 2) *Stages described in the Model of Hierarchical Complexity*

Order or Stage	What they do	How they do it	End result	Language and processes
0	calculatory	Exact–no generalization	Human made program manipulate 0, 1	None
1	sensory & motor	Discriminate in a rote fashion, stimuli generalization, move	Move limbs, lips, eyes, head View objects and movement	Discriminative and conditioned stimuli
2	circular sensory-motor	Form open-ended classes	Reach, touch, grab, shake objects, babble	Open ended classes, phonemes
3	sensory-motor	Form concepts	Respond to stimuli in a class successfully	Morphemes, concepts
4	nominal	Find relations among concepts Use names	Use names and other words as successful commands	Single words: ejaculatives & exclamations, verbs, nouns, number names, letter names
5	sentential	Imitate and acquire sequences Follows short sequential acts	Generalize match-dependent task actions. Chain words	Pronouns: my, mine, I; yours, you; we, ours; they, them
6	preoperational	Make simple deductions Follows lists of sequential acts Tell stories	Count random events and objects Combine numbers and simple propositions	Connectives: as, when, then, why, before; products of simple operations
7	primary	Simple logical deduction and empirical rules involving time sequence Simple arithmetic	Adds, subtracts, multiplies, divides, counts, proves, does series of tasks on own	Times, places, counts acts, actors, arithmetic outcome from calculation
8	concrete	Carry out full arithmetic, form cliques, plan deals	Does long division, follows complex social rules, takes and coordinates perspective of other and self	Interrelations, social events, what happened among others, reasonable deals
9	abstract	Discriminate variables such as Stereotypes; logical quantification; (none, some, all)	Form variables out of finite classes Make and quantify propositions	Variable time, place, act, actor, state, type; quantifiers (all, none, some); categorical assertions (e.g. "We all die ")
10	formal	Argue using empirical or logical evidence Logic is linear, 1 dimensional	Solve problems with one unknown using algebra, logic and empiricism	Relationships are formed out of variables; words: linear, logical, one dimensional, if then, thus, therefore, because; correct scientific solutions
11	systematic	Construct multivariate systems and matrices	Coordinates more than one variable as input Consider relationships in contexts	Events and concepts situated in a multivariate context; systems are formed out of relations; systems: legal, societal, corporate, economic, national

12	metasystematic	Construct multi-systems and metasystems out of disparate systems	Create metasystems out of systems Compare systems and perspectives Name properties of systems: e.g. homomorphic, isomorphic, complete, consistent, commensurable	Metasystems and metasystems are formed out of systems of relationships
13	paradigmatic	Fit metasystems together to form new paradigms	Synthesize metasystems of	Paradigms are formed out of multiple metasystems
14	cross-paradigmatic	Fit paradigms together to form new fields	Form new fields by crossing paradigms	New fields are formed out of multiple paradigms

Table 3 The Model of Hierarchical Complexity and Skill Theory (Fischer, 1980 **Fischer, 1980) have ordered problem-solving tasks of various kinds, including:**

Social perspective-taking Commons & Rodriguez, 1990; 1993) Informed consent Commons & Rodriguez, 1990, 1993). Attachment and Loss Commons, 1991; Miller & Lee, 1998) Workplace organization (Bowman, 1996a; 1996b) Workplace culture (Commons, Krause, Fayer, & Meaney, 1993) Political development (Sonnert & Commons, 1994 Sonnert & Commons, 1994) Leadership before and after crises (Oliver, 2004 Oliver, 2004) Honesty and Kindness (Lamborn, Fischer & Pipp, 1994 Lamborn, Fischer & Pipp, 1994) Relationships (Cheryl Armon, 1984a, 1984b Cheryl Armon, 1984a, 1984b) Good Work (Cheryl Armon, 1993 Cheryl Armon, 1993) Good Education (Dawson, 1998 Dawson, 1998) Good interpersonal (Armon, 1990) Views of the "good life" (Armon, 1984c; Danaher, 1993; Dawson, 2000; Lam, 1994) Evaluative reasoning (Dawson, 1998) Epistemology (Kitchener & King, 1990; Kitchener & Fischer, 1990) Moral Judgment,.Armon & Dawson, 1997; Dawson, 2000)	Language stages (Commons, et. al., 2004) Writing (DeVos & Commons, unpublished manuscript) Algebra (Commons, in preparation) Music (Beethoven) (Funk, 1990) Physics tasks (Inhelder & Piaget, 1958) Four Story problem (Commons, Richards & Kuhn, 1982; Kallio & Helkama, 1991) Balance beam and pendulum (Commons, Goodheart, & Bresette, 1995) Commons, Goodheart, & Bresette, 1995) Spirituality (Miller & Cook€Greuter, 2000 Miller & Cook-Greuter, 2000) Atheism (Nicholas Commons€Miller, in preparation Nicholas Commons-Miller, in preparation) Animal stages (Commons and Miller, in press Commons and Miller, in press) Contingencies of reinforcement (Commons, in preparation) Commons, in preparation) Hominid Empathy (Commons & Wolfsont, 2002 Commons & Wolfsont, 2002) Hominid Tools Making (Commons & Miller 2004 Commons & Miller 2004) Counselor stages (Lovell, 2004 Lovell, 2004) Loevinger's Sentence Completion task (Cook€Greuter, 1990) Cook-Greuter, 1990) Informed consent (Commons, Rodriguez, Cyr, Gutheil Commons, Rodriguez, Cyr, Gutheil et. al., in preparation) Report patient's prior crimes (Commons, Lee, Gutheil, et. al., 1995) Commons, Lee, Gutheil, et. al., 1995) Orienteering (Commons, in preparation Commons, in preparation)

Table 4 (LoCicero, Personal Communication, 2005 LoCicero, Personal Communication, 2005, Dawson, 2004 Dawson, 2004)
Comparing MHC with Kegan, Womens's Ways of Knowing, and Perry Position

Model of Hier-archical Complexity	Kegan (1983) Stages	Kegan Descriptions	WWK Descriptions	Womens' Ways of Knowing Stages. Belenky et al. (1996) Belenky et al. (1996)	Perry Positions Dawson (2004) Dawson (2004), Commons	
Stage 9 Abstract	Stage 3: Inter-personal	Able to coordinate own needs and interests with others; unable to prioritize.	Distrusts conventional authorities; trusts experience, intuition	Position 3: Subjective	Position 1: abstract Position 2: abstract/formal transition?	
Stage 10 Formal	3-4 Transition	Shaky sense of self-as-authority, self-sufficiency.	Beginning to appreciate objectivity; procedures for sharing and evaluating knowledge.	3-4 Transition	Perry Position 3 formal Position 4 formal/ systematic transition	
Stage 11 Systematic	Stage 4: Institu-tional	Self-sufficiency, authority. Identification secure. Knows where one stands.	Concerned with methods and procedures for obtaining and sharing knowledge. Interested in objectivity. Learns by doubting game (separate) or believing game (connected).	Position 4: Procedural (Separate and Connected)	Position 5 Systematic Positions 6-7 Systematic/ metasystematic transition	
				4-5 Transition		
Stage 12 Meta-systematic	95	Sees limits of self-sufficiency. Somewhat aware of isolation. Moving towards intimacy and directness.	Beginning to see self and others as creators of knowledge.	Stage 5: Constructed	Positions 8, 9 Metasystematic	

| Stage 13 Para-digmatic | Stage 5: Inter-individ-ual | Relates to others directly. Not role-bound. Intimacy. Recognizes reality as co-constructed and self as continuously created by multiple relationships. | Knowledge as situated. Integration of subjective and procedural. Sees self and others as creating and co-creating knowledge. | | | |

Table 5
Comparative Table of Concorded Theories of Early to Postformal Stages

Researchers	Abstract	Formal	Systematic	Meta-systematic	Paradigmatic	Cross-Paradigmatic	Transcen-dental
Commons & Richards (1984) Commons & Richards (1984)	9 (= 4a)	10 (= 4b)	11 (= 5a)	12 (= 5b)	13 (= 6a)	14 (= 6b)	
Sonnert & Commons (1994) Sonnert & Commons (1994)	group	bureaucratic	institutional	universal	dialogical		
Inhelder & Piaget (1958) Inhelder & Piaget (1958)	formal III-A	formal III-B	postformal	polyvalent logic; systems of systems			
Fischer, Hand, & Russell (1984) Fischer, Hand, & Russell (1984) Fischer, Hand, & Russell (1984)	7	8	9	10			
Sternberg (1984) Sternberg (1984)		first-order relational reasoning		second-order relational reasoning			
Kohlberg (1981) Kohlberg (1981)	3 mutuality	3/4	4 social system	5 prior rights/ social contract 6 universal ethical principles			
Benack (1994) Benack (1994)	4	5	6	7			