TRUE, GOOD AND **GENERAL SYSTEM THEORIES:**
How to **DEVELOP AND EVALUATE** Them

by Carl Slawski, Emeritus Professor of Sociology (CSULB)
555 S. Ventu Park Rd., Newbury Park, CA 91320, USA

Abstract

This review attempts to codify the bases in philosophy of science, physical and social, in order to aid future generic theory construction, development, evaluation, and potential research funding. To lay the groundwork, a theoretically core building block of a true theory is a **unit concept,** here proposed as "**change in relationships."** The overall procedure is built on the definition of true **theory** as a set of **deductively interrelated hypotheses**, which has important evidence to back it up (G. Homans, 1967). The seven section headings below (1 through 7) will each be represented by at least one main chart.

1. A Generic **4-BOX FLOW DIAGRAM**, Chart #1a, taken as a <*SORTING*> device, is a way of advancing from typologies and paradigms to a process diagram applicable to any brain-like mechanism in an interacting system. A variation makes the chart applicable as a general Social Problem Solver for applying any theory to concrete cases (Chart #1b). <Six meta-procedural foci are stated in caps within six pairs of carets in this abstract, and proposed as the overarching program advocated in this paper.>

2. **LEVELS OF TRUE THEORY** (GST's) stated in Chart #2a (one Pre-theory + 3 Full levels), are a way of <*PRIORITIZING*>, identifying overall global classification criteria culminating in a general application (whether oriented to policy or helping), one that contains practical prescriptions or guidelines for effective or fulfilling action (1988, 1989, 1993). A ladder of ten **meta-methodological concepts** in theory construction is reduced here (Chart #2) to the **THREE LEVELS OF TRUE GST** (General System Theory)**.** The levels are labeled from bottom to top Level as follows, # 'A', **ahP (*ad hoc* PRE-Theory),** then up through the three main Levels: #1) '**LPC' (LIMITED PROBLEM (or Issue) CENTERED**, #2) '**PAM' (PURE ABSTRACT, MULTI-LEVEL),** and finally to #3) '**CESP'** (**COMPREHENSIVE ECO-SOPHICAL POLICY**).

3. A relationship insight DEVICES typology arrays possible generic **MEDIA FOR UNDERSTANDING** (Chart #3) in an approach to a kind of cognitive <*SATURATION*>.

4. This causal and typological list attempts to focus on a top level, short flow chart of **13** interrelated **Core Hypotheses** (Chart #4a). Then the main distinctive hypotheses (Chart #4b) include applications to the case of the 2008-2009 Auto-Makers Financial Crisis. Overall, this flow chart and statement represents a broad attempt at setting up a model for <*CODIFYING*> many extant, classical GST's in a way that will be useful for core analysts and consultants evaluating any problematic social or organizational problem.

A case of a **TRUE, GOOD AND GENERAL SYSTEM THEORY** (Chart #4b, column #3)

aims at <*ILLUSTRATING*> the possible utility of the overall approach presented here. Specifically, in short, a chart of "Systemic Causes" illustrates only one of many possible pertinent true and general theories (top level, i.e., Level #3).

5. Flow chart (#5a) elaborates "Generic Elements of A TRUE THEORY: INSTITUTIONALZING INNOVATION in an Organization (1975, with references to the Auto Manufacturing Crises). Then come eight "Interrelated Breakout Hypotheses" as an executive report. Chart #5c lists "Concluding (Generic) Recommendations" extracted from the same hypotheses

6. A final flow diagram, Chart #6a, outlines *per se* "Why Rule Changes Rarely Improve" much of anything.

7. Finally, expanding upon the main criteria for a good theory, first four, then thirty-three criteria are stated for the reader to employ in rating and evaluating the success of each theory as applied. The four main **CRITERIA FOR A GOOD THEORY**, Chart #7a, with the goal of <*RATING*> and evaluating the success of any theory as applied (taken from Slawski's original 1974 article in *Zeitschrift fur Soziologie*, plus many prior *Proceedings* papers), are: **1) Ease of application or testability, 2) information value, 3) predictability,** and **4) explanatory power** (the most crucial criterion of all). Every theory and every hypothesis should be measured up against these four criteria. The expanded list (Chart #7b) of up to **33 Criteria for a Good Theory** can be applied to any clearly describable situation, including an organizational **Policy Theory**, a **Helping Situation,** or any comprehensive and deductively stated theory.

Keywords: GST, criteria for constructing and evaluating theories, true and good theory, insight devices, crisis resolution in manufacturing.

VERBAL OVERVIEW OF CHART FORMS (Toward a GST)

Without reference to the full text originally accompanying each of the (main flow) charts in this graphical (or poster-type of) presentation, we can only give a bare bones overview. For curious readers (or browsers' passing by), it should be a good review of philosophy of science and research methods, both for the generally simpler because more controlled physical science, development and testing methods, but may be even more useful for those attempting to employ the very complex social, including management science approaches to verification and theoretical understanding. Hopefully, some browsers will be inspired to consult the references, mostly from prior ISSS/SGSR Proceedings (both textual volumes and, in more recent years, the CD-ROM's). In a way, the approach presented represents the author's autobiographical road through the maze, first from early historical description of various social and physical scientists' basic conceptual analyses, through more and more complex tools for doing research, then for integrating the often disparate-appearing theories, with their frequently mutually hostile defenders. The goal of the seeker was and remains an integrated, preferably holistic, understanding and explanation of the various problematic scientific, social and ecological issues

that confront the contemporary world. The ultimate aim remains healthy, happy living through self-realization plus socially and ecologically wise conduct.

1. The first top-level *SORTING* device, based on a very large number of typologies, ideal types, and paradigm triangulation, starting from a unit concept, namely "change in relationships," is Chart I, the generic **4-BOX FLOW DIAGRAM.** Adapted and modified from the basic three-box flow chart of action, results, and feedback, the author has added the fourth box, essential to a multi-level analysis, namely the contextual variables (which might include groups of similarly acting brain-like mechanisms, or social, organizations, community, societal, cultural or supra-national and ecological systems). A good starting point for understanding a curious phenomenon or unclear anomaly, from a scientific perspective, is to try to fill in the four boxes in a blank chart of this form, first with the concepts and variables that apply for each box and each arrow between the boxes, and secondly (Chart #1a) with the suggested questions that ought to be asked in order to come up with a solution to the key or crucial or defining problem to be addressed in a Social Problem Solver procedure. This approach may be enhanced by applying extant theories to the chosen situation or problem (e.g., perhaps based on Slawski's summaries of the sixteen most basic theories in *Social Psychological Theories*, 2004, or summaries of more macro level sociology, such as seen in Jon Turner's modern sociological theories texts (in multiple additions), with their lists of main hypotheses, or the more typological texts of G. Ritzer).

In Chart #1b, the same 4-Box Flow Diagram (as for #1a) is employed with different content, the Social Problem Solver, represents the cycles of generic questions that must be asked to solve any particular problem in the system under consideration. (Details of the diagram were described originally in Slawski's 1986a paper for the ISGSR, Philadelphia).

2. The format of a flow diagram in general presumes a research oriented approach wherein the basic building block of any theory is recognized to be the hypothesis, a statement equivalent to cause and effect, or developmental antecedent and consequent, of the general form "IF something occurs, THEN something else specific will follow." At very least, this approach, starting form a small number of basic and interrelated hypotheses (Homans on hypotheses, R. Merton on codification) will help to summarize the essence of several alternate explanations so that they can more easily be compared in testable form (for everyday scientists) rather than presuming a highly abstract, axiomatic, or abstruse philosophical sophistication or imagination to be indulged in only by an elite and rarified oligopoly of scholars. The browser or reader here should keep in mind the definition of a theory presumed (as per Homans, et al, 1967) is 'a set of deductively interrelated hypotheses.' This does not mean that such a set is the starting point, or even the end point, but only that such a statement should appear somewhere in a central position in each piece of scientific writing or discourse. The typical chronology of scientific or systemic inquiry does not necessarily hold a preferred starting point, such as: "In the beginning, State Your Central Hypothesis." Experience and imagination will in most cases direct the budding researcher or theorist toward a first point of focus. The message should be that somewhere there should be a statement in each published work of a limited number of interrelated, and empirically testable hypotheses.

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All of the single (and not-yet-logically-interrelated) statements, pre-hypotheses, conceptualizations, typologies, and the like, without the required statement of at some point "deductively interrelated hypotheses," remain at the PRE-theoretical level of scientific development, designated in Chart #2 as Level #A, '**ahP**,' standing for ad hoc PRE-Theory. Above this on the chart, on three ascending levels of TRUE GST (General System Theory), is a plausible way of *PRIORITIZING* sophisticated examples of general theory when such comprehensive theories are found or developed. GST is characterized at a root level as cross-level, bridging concrete levels of analysis, such as from the organism to the group, community or society (reminding us of JG Miller's 9 designated concrete levels of Living System Theory, 1978). There are in fact very, very few theories that reach this level to date. In any case the author proposes that the most basic of the three levels of TRUE GST is '**LPC'** [Limited, Problem (or Issue) Centered, Level #1], limited in scope and number of concepts and hypotheses in order to keep the formulation within manageable boundaries. The second, or middle level, is designated '**PAM**,' standing for Pure Abstract Multi-Level, or concept-centered, formally stated, and highly integrated theory. Level #2, the top or third level of true GST is here designated '**CESP**,' standing for Comprehensive Eco-Sophical Policy, in other words, a true and general theory with implications applied to solving concrete problems for the ecology or survival of the earth and its inhabitants. (The "ecosophy" notion, as a substitute for purely rational or logical approaches to the environment, is based on the work of Arne Naess 1986. Of course, it means wise use of the environment.)

For those interested in future, more in depth research and analysis, some suggested pre-theories or lower level theories (Levels #2 and #3) that are directly applicable to the organization theories potentially useful for the American automakers financial crisis of 2008-2009 are the following:
Level #A (Problem-PRE-Theory, 'ahP'): 1) Bozeman (2000), *Bureaucracy and Red Tape*; 2) Senge (1990), *The Fifth Discipline*; 3) the Boyetts' *Guru Guides.*

The number of such directly applicable pre-theories that move in format and content beyond Level #A are very few indeed, as the reader can observe by scanning and browsing the table of contents of compilations like the Guru Guides of Boyett & Boyett, (with partial titles as follows): *The Best Ideas of the Top Management Thinkers (1998)*, and *The…Guide to Entrepreneurship (2001*). Of course, some of these pre-theories could be developed by a skilled logician or organizational theorist into a full-blown theory as defined in this present chapter. However, until that sometimes tedious task is accomplished, these illustrative statements of concepts and principles and will have to be classified at this time as Level #A, Pre-Theories ('ahP').

Level #1, a Limited Problem, Cross-Level ('LPC') focused theory (i.e., true and good, with hypotheses deductively or abductively interrelated) would be a slight restatement of Moore and Tumin's (1949) work of "Some Social Functions of Ignorance."

A second example of theory Level #1 would prominently include Argyris' (1990) on *Overcoming Organizational Defenses: Facilitating Organizational Learning* (especially as

boiled down by Slawski in Appendix E of his 2002 ISSS Proceedings paper on "Managing BUREAU-cratitis").

Level #2, Pure Abstract Multi-Level theory ('PAM') for the auto manufacturer's case would be Slawski's (1990a) "A Small Group Process Theory of Designing Self Renewing Organizations." This would be applicable to the internal meetings, formal or informal, among the executives of the organization under study (such as the auto executives of either manufacturer, or between the top executives of all three companies meeting together say before their appearance before their testimony at the congressional hearings on the financial "bailout" situation. The result would likely be a better understanding of the roles, styles of communicating, and the personalities of each such executive, as well as their relative effectiveness in that kind of in-group, or relatively intimate situation.

A first example of theory Level #3, Comprehensive Eco-sophical Policy theory (the top or ideal level, 'CESP') would include William Ouchi's (1981) *Theory Z: How American Business Can Meet the Japanese Challenge.* A second example of this Level #3 theory, with further formalization of his hypotheses (which I believe he himself would resist), would be Linstone's (1984) approach of triangulation of methods and theories (TOP, standing for Technical, Organizational and Personal) for practical, real-case analysis in mostly industrial situations.

A third example of a Level #3 theory would be the statements in Slawski's 1975 conference paper on "Institutionalizing Innovation in an Organization," which was a lengthy development of hypotheses based on a detailed case study of a student protest movement at a California state university at the height of such times of protest. A select number of those potentially most applicable hypotheses is diagrammed in flow chart format in Chart #5a, and stated in corresponding formal, verbal hypotheses in a list labeled Chart #5b. Finally, a whole set of intuitively developed executive recommendations is then stated in a list as Chart #5c. Specific applications of each hypothesis to the automakers' problem is beyond the scope of this present chapter. In any event, this hint of an application to the negotiations around the 2008 and following financial crisis is the end goal of the model for analysis and the approach described in this chapter. Overall, the issues of 1) how to guide a student movement and 2) how to reform automobile industry design, production, and survival capabilities may seem far apart, but the importance of the GST approach proposed in this chapter is exemplified by this very possibility.

3. The second layer of inquiry suggested here is that of stimulation by whatever means is congenial to the thinker or researcher of the implications from prior theories or methods of imaginative playing with ideas, so that the thinker's mind engages in cognitive *SATURATION* with the main points of the investigation from all plausible perspectives, without omitting the possibilities for serendipitous discovery or insights. The top level picture here is seen in Chart #3, Media for Understanding, (Slawski: 2000), taking the form of cross-classification of scientific and humanistic approaches on the horizontal dimension with theoretical to concrete modes on the vertical dimension. The main message of this representation is to remind the reader of the normal way to use human imagination, focusing, preoccupation with, relaxing and

concentrating again and again on the issues or problems to be understood if not resolved or managed.

4. To give the reader the flavor of the utility of this highly comprehensive approach, let us first examine some ideal theoretical forms, then later the (4 + 33) criteria for evaluating them. For now we can move on to an examination of practical organizational cases of applications of extant general theories. Without going into detail for each statement, but only as a way to exemplify the matter of *CODIFYING* general theories, Charts #4a and #4b present an abbreviated array of 13 hypotheses in a classification system, shortened from a more complete list of 27 derived from or attempting to summarize the essence of LST (Miller's *Living System Theory*, 1978) along with some other lesser versions of GST. To understand this would take repeated periods of rumination of the list of actual hypotheses, perhaps along with their implied positive prescriptions for social and ecological betterment.

In an effort to maximize the possible explanatory result, the 13 most crucial hypotheses are gathered (followed in the succeeding Table #4b, in column two by maxims or proverbs to give somewhat more directly understandable perspective, then finally by column 3 with its corresponding prescriptions for action in the chosen case of the American Auto-Maker's financial Crisis of 2008-2009). This example of a true theory, at the top Level #3, appears in Charts #4a & 4b, in its starkest, most parsimonious terms, in virtually axiomatic format, in an attempt to represent an ideal form of <*ILLUSTRATING*> a true, good and General System Theory (a GST).

Based on a very selective and abstracted collection from theoretical books and papers, with special emphasis here on hypotheses and theories related to bureaucracy and innovation, are given in Chart #4a, a roughly axiomatic (or at least an abductive, intuitive and more practical interpretation of previous hypotheses), with a generic causal diagram that is expanded into corresponding interrelated hypotheses (following the chart). The first flow diagram, Chart #4a, consists of the 13 most central hypotheses from the more complete list of 27. [More detail of the derivation appears in Slawski's 1995 ISSS Proceedings paper]. For now, the most important thing to do is to study the details and try to apply them to a given, current, real-life organizational or social psychological problem. This is a rather slow and often even tedious task, but it is essential to do this kind of exercise in order to develop more widely applicable general, as well as true and good theories, the overall purpose of this present chapter. In the end, or somewhere along the way, it would be important for the analyst to state practical recommendations for the specific problematic case under evaluation, along the lines of the list that follows. Thus, the Flow diagram, at the Level 3, 'CESP" or top level, is followed first by eight interrelated "Breakout Hypotheses" (Chart #5b), then by the list of more Generic Recommendations (Chart #5c) for managers and decision makers to study for an overview of crucial or essential issues for solution or management.

5. Flow Chart #5a, Generic Elements of a True Theory: Institutionalizing Innovation, is a short version of a much more complex chart of the interrelations between the main features of attempts by actors or activists to attempt to change the workings of a large organization (going

back to Slawski's 1975 case analysis of student protest at a state college). The same basic principles apply to issues that surface in the mainly American automobile manufacturers' financial crisis of late 2008, in terms of five global variables. A) The possible sources of positive change attempts affect B) the current order of the situation, which in turn presents (or will present) C) new or old and recurring problems. The new problems will result in certain D) observed thrusts in the main actions of the situation. Lastly, (E) certain facilitating aspects of the overall (even the environmental) situation interact with the sources of and attempts at positive change. The whole set of interactions represents the outline of a Level-3 ('CESP,' i.e. a) Comprehensive Eco-Sophical Policy theory. Hints at applications to the case of the automobile manufacturers recent (late 2008) problems are stated within the five boxes of the flow chart. Built upon the flow chart itself are eight generically stated and interrelated "Breakout Hypotheses" (in Chart #5b). They are stated in way that is hopefully applicable to most organizational problem situations. Their utility will depend upon the skill of the analyst and the plausibility of the full description to the executives potentially in charge of the organization. Lastly, in this context, Chart # 5c presents a list of Recommendations per se, again in generically stated form, this most likely being the most valuable because directly applicable statements for a busy top executive. When such recommendations are translated into the particulars of the case under scrutiny by the consulting analyst, the utility of the theory per se will become most evident. From this exercise, new refinements of the more general theory will no doubt surface, but the importance or overall value of such theoretical overviews (i.e., true, good and general theories) should become clear.

6. A generic flow chart about "Rule Changes" (Chart #6a) next attempts to state a more abstract formulation that will hopefully be applicable to a wider variety of real life problematic situations of social or bureaucratic organization. This is a more specific or content-focused parallel in intent to Chart #4a, "Systemic Causes: Order, Change and Actualization" (the most generic theoretical attempt as it was developed from LST, J. G. Miller's *Living System Theory*, and from a very selective short list of complementary theoretical statements, referred to in Charts #4a and the accompanying Chart #4b respectively as illustrations of either a Level 2 or 3 theory.

[Amplify above?]

CRITERIA FOR EVALUATING QUALITY of Research, Creative or Scientific Activity (possibly for presentation at annual meetings or in-print publications):

7. Once the scientific inquirer has found or stated a theory, at any level of analysis or generality, it is essential to evaluate it in comparison with other competing or rival theories. The author long ago sifted through the potential criteria and developed a rationale, leading the 4 main CRITERIA FOR A GOOD THEORY (*Zeitschrift fur Soziologie*, 1974). This is perhaps the most critical point of the current presentation, and will be elaborated with more detail than the other sections. It can be focused on Chart 7a, a listing of the four criteria set up to compare at least two theories with side-by-side <*RATING*>. Each individual rating should be evaluated in relation to concrete facts of the case being dissected with the two or more theories.

The theoretical underpinning of the statement of the four main criteria have been elaborated in the author's 1974 *Zeitschrift* paper, as well as in simpler language in his *Social Psychological Theories* text (1992/2004 versions, or), then eventually expanded into 33 criteria (1994a: ISGSR, Asilomar, and following years) that can be applied to either physical, biological, or social scientific theory applications, or for any GST, whether it be a Helping Procedure, or alternately for a set of Policy Guidelines (with the latter two each representing a sort of practical, applied, "policy system" sometimes referred to as "soft systems" theories).

Making use of the four main criteria, along with some preliminary creative criteria, there follows a list that might prove useful for those reviewing papers for acceptance and presentation at meetings and conventions of scientists at many professional associations.
To what extent does the proposed oral paper, poster presentation, or manuscript submitted for publication, do the following?
A. CONTRIBUTE TO:

*The theme of the conference (as per a given professional association president's Call for Papers).

*The objectives of the association (such as the ISSS, as per its bylaws), especially regarding the search for or use of the parallels or isomorphism across levels of scientific analysis, especially when the parallels promise to lead to an integrative synthesis, as well as ultimately to the betterment of humanity.

*Incorporate or append a short (or long) but thoughtful, penetrating, or provocative list of discussion questions.

Copies of these discussion questions could be distributed or listed in advance in large, readable letters, on a display or chalk-board, and introduced say after a ten-minute initial review of the formal paper contents. Ideally, the formal papers would have been made available and read by as many persons as possible before the start of a given session. This in turn would be facilitated by ready availability of CD-ROM readers near the registration desk, or through availability in some central location of three hard copies of the total proceedings. This would also be an aid to those whose native language was not English.

B. Does the STYLE OR FORM of the work under review do the following?
*Keep within the page limits stated in advance.
*Observe correct grammar and spelling.
*Maintain adequate referencing and footnoting.
*Clarity of overall message(s).

C. CONTENT:
*Does the text should (at least somewhere) state the author's working definition of "THEORY" per se.

Theory could be defined as philosophy, meta-theory, a collection of concepts, typologies, a model (graphic or verbal), a set of processes, etc., that is amenable to empirical investigation. "Systems education" could for example be considered a "soft systemic model." Ideally a scientific theory is defined as "a set of interrelated hypotheses" that explains change or

development over time.
*Review a range of prior written work on the subject matter covered, upon which the present paper builds, transforms, supplants, re-assesses or rethinks.
*Gives due consideration to, or enhances the possibility of comparing two or more theories in a more or less systematic manner.
*States how to combine theory, method, and practice or at least potential applications, in terms of verifiable, i.e., testable hypotheses (typically including plausible but explicitly stated assumptions and accompanying definitions, whether the definitions are operational or conceptual).
*Originality.

D. Does the work measure up (on a loose rating scale) to a minimum satisfaction level on each of four criteria for a GOOD THEORY (Chart #7a), namely:
1. Ease of Application or TESTABILITY,
2. INFORMATION VALUE (describing what happens),
3. PREDICTABILITY (or postdiction or retrodiction), and ultimately,
4. EXPLANATORY POWER (the most essential criterion of all, showing WHY change occurs).

These criteria are described below and displayed in Chart #7a. They can be expanded with subordinate criteria under each of the four into as many as 33 criteria (e.g., Slawski, ISSS *Proceedings*, 1994a) which will vary a bit depending on whether the content of the paper is pure theory or a form of "soft system" methodology, i.e., a method of critical analysis (such as the systemic tradition of CSH, Critical Systems Heuristics) oriented toward a specific social or organizational problem. They could be rated in a table with numerical ratings, say a (0-4) scale, with 4 being "high." It should be possible to give reasons for each rating even if they are not explicitly stated in an evaluation.

The table below assumes that two or three theories are being compared in the quality of their application to the same case of change in a person or group over time, before and after some crucial intervening event. Ideally more than one theory should be comparatively evaluated one after the other, even though only one may be the primary focus.

DETAILS ON THE FOUR (or 33) CRITERIA FOR EVALUATING A GOOD THEORY

References are from Slawski's *Social Psychological Theories: A Comparative Systems Handbook for Students* (2004/1992). The following is an extract with a few modifications. Only slight changes in wording were needed to apply the criteria to research and cases in the physical sciences. Management science of course is a form of applied social science.

With the preceding overview of the nature of scientific theory, theoretical problems, and the modes of theory construction, the student or scholar has the seeds of what to look for when approaching a new (social or physical) theory or problem. Innumerable other considerations could be discussed which, for certain limited, say classificatory purposes, might shed some light on the philosophy, substance, or methodology of social science. The number of possibilities is so

great that many theorists and philosophers have alternatively written books and been baffled by the problem of evaluating theories comparatively. Classification, however, is not enough. Nor is it sufficient to analyze one theory at a time. Because of the complexity and abstractness of theories and evaluative criteria, we need a point-by-point comparison of two or more theories at a time. This approach is not only theoretically sound, not to mention neglected, but also pedagogically crucial. It is quite clear in addition that to compare two complex theories as a whole is a task suitable only for genius. Thus, our approach will be to suggest comparison of the main points of two or three theories at a time, as applied to a single instance of personal or social or physical change over time.

The present author's previous guiding task from long-ago has been to reduce the huge number of possible evaluative criteria to the most important ones, without leaving out anything really essential to the nature of theory. On these grounds, four criteria at minimum seem necessary (cf. Slawski: 1974, *Zeitschrift fur Soziologie*). In a natural chronological order of use for evaluating theory, they are: (1) ease of application, (2) information value, (3) predictability, and (4) explanatory power.

1. Ease of Application or Testability

In common-sense applications of a theory, the relative ease of application depends on the understandability of the theory to the persons using it, and the degree to which the terms and hypotheses of the theory fit the facts of the case under analysis. Social (and physical) scientists, however, are more likely to go beyond the intuitive and examine the question of testability of a theory. It involves the extent to which the variables can be separately and reliably measured by different researchers. If we could not measure the concepts, our theory would not be falsifiable, but rather be a tautology or mere opinion. We could not then gather evidence for and against the validity of the hypotheses contained in the theory. A result of testability is the degree to which the theory is productive for those doing research. That is, how fruitful is it in generating evidence? Testability also involves the applicability of the theory to real-life events. Ideally, a tested theory should be applicable to policy decisions of administrators, or perhaps to recommendations and therapeutic methodologies of counselors and organizational change agents. Furthermore, a testable hypothesis is methodologically sound. The form of the theory as a whole must be clear, simply or economically stated, complete in application to the events to be explained. It should be elegantly stated as well (Mullins: 1971). Finally, the indicators of each concept of the theory should be observable in a way that will allow us to quantify them. As a final word, it should be clear that for a student who has not yet had a course in (social or physical scientific) research methods, these points about testability) can be safely passed over lightly. He should instead focus simply on the ease of application of the perspectives presented to events and experiences in his own group life.

2. Information Value

Once we discern that a theory is applicable to the case under consideration, it is natural to look at the criterion of information value. Here we ask the questions: How well does the theory help us to describe what actually happens, the nature of the events and their sequence? Do the range and quality of the concepts and hypotheses of the theory focus our attention on the

meaningful and significant, on facts and solid ideas rather than on mere opinion, the trivial or tautologous? An informative theory is also proximate to experience rather than purely conceptual.

3. Predictability

The third crucial criterion for judging a theory is its predictive potential. Are the variables related in causal or functional statements? Do the statements tell us, for example, that if and when A happens, B will follow? Naturally, if we can predict, then we can more easily control our destiny, or at least set limits to it. Another aspect of prediction is postdiction, which is prediction of events occurring at 'time-2' (after the turning point) from the events or circumstances at 'time-1' (before the turning point), but making that prediction at a point in time after both 'time-1' and 'time-2' events have already transpired, or even where data have already been collected on both points or periods of time. We may be able to predict, however, on the basis of past experience alone, through correlations, even without being able to explain why the prediction held true. This brings us to the fourth, and most important, of the criteria for judging a theory, namely, explanatory power.

4. Explanatory Power

Explanatory power is the essence of a theory. It tells how well a theory shows why there was change or stability in a person or group over a given period of time. More broadly, it tells why what actually happened did in fact occur. Finally, it evaluates how well the hypotheses of the theory order the data, the basic concepts, relationships, and assumptions. Explanation is another word for theory. It goes beyond prediction. Prediction without reasons, without knowledge of conditions, causes, or motives is a useful happening, but a poor substitute for understanding. If we understand, we will also, of course, be more able to predict. Thus, with these four criteria, we have a very general but very powerful means of comparing and evaluating virtually all perspectives that could be called General System Theory, or the realm of integrative science.

Finally, Chart #7b expands the four essential criteria into a list of 33 that reminds the analyst of virtually all the essential subordinate aspects for any kind of theory. The availability of the three right-hand columns suggest the possibility of comparative analysis or two or three theories side-by-side for an even greater overall understanding of the single social or organizational problem under scrutiny. This approach could be viewed as a form of "triangulation" of theoretical evaluation, an optimum or ideal for the enterprise described in this chapter.

Overall, in review, we have tersely presented a potentially insightful procedure for developing true, good and General System Theories by generic creativity techniques of sorting, saturation, prioritizing, rating, codifying, and illustrating their use.

[This chapter is a much expanded and refined version from the ISSS Sonoma 2006 poster session, plus oral presentation, with appearance in those annual meetings Proceedings.]

[Slawski --- 3+ 4/9/06 → 12/18/08, TgGstPst.doc] [END of text]

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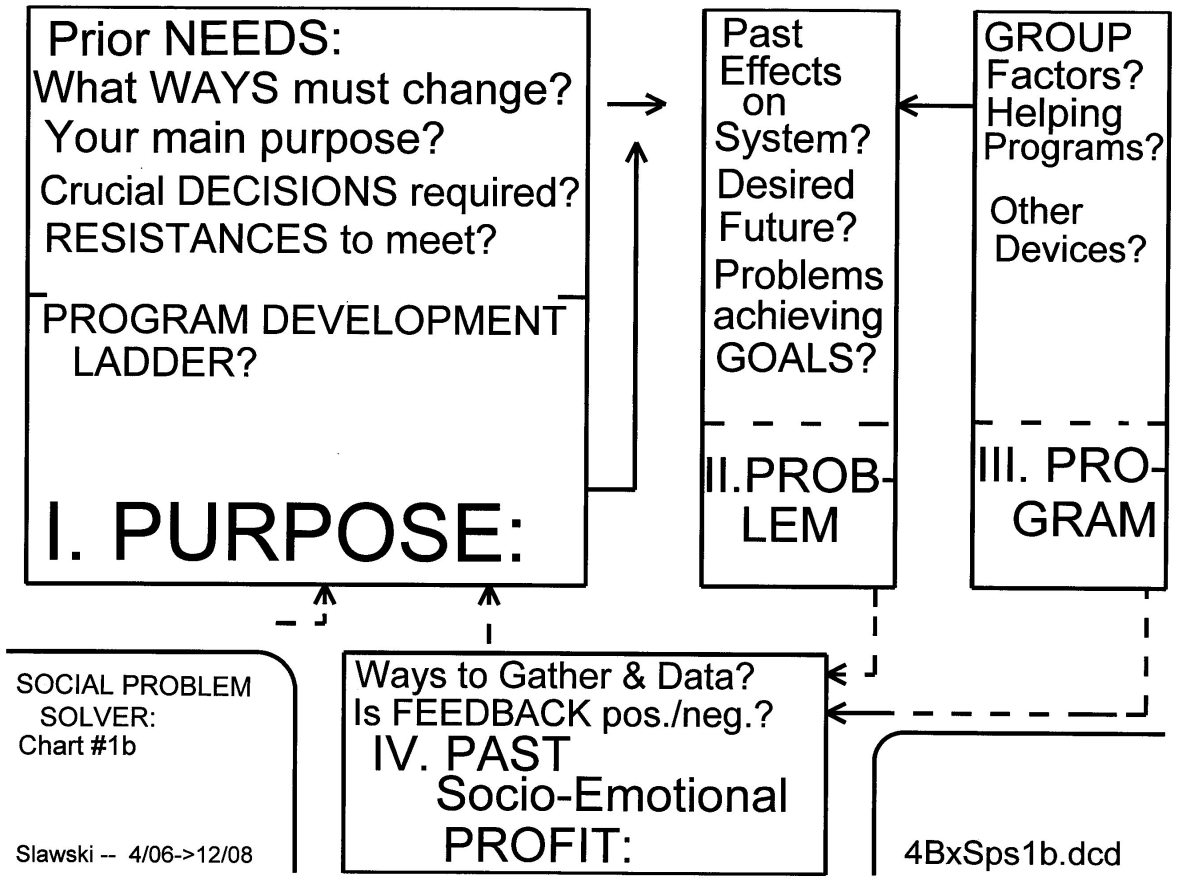
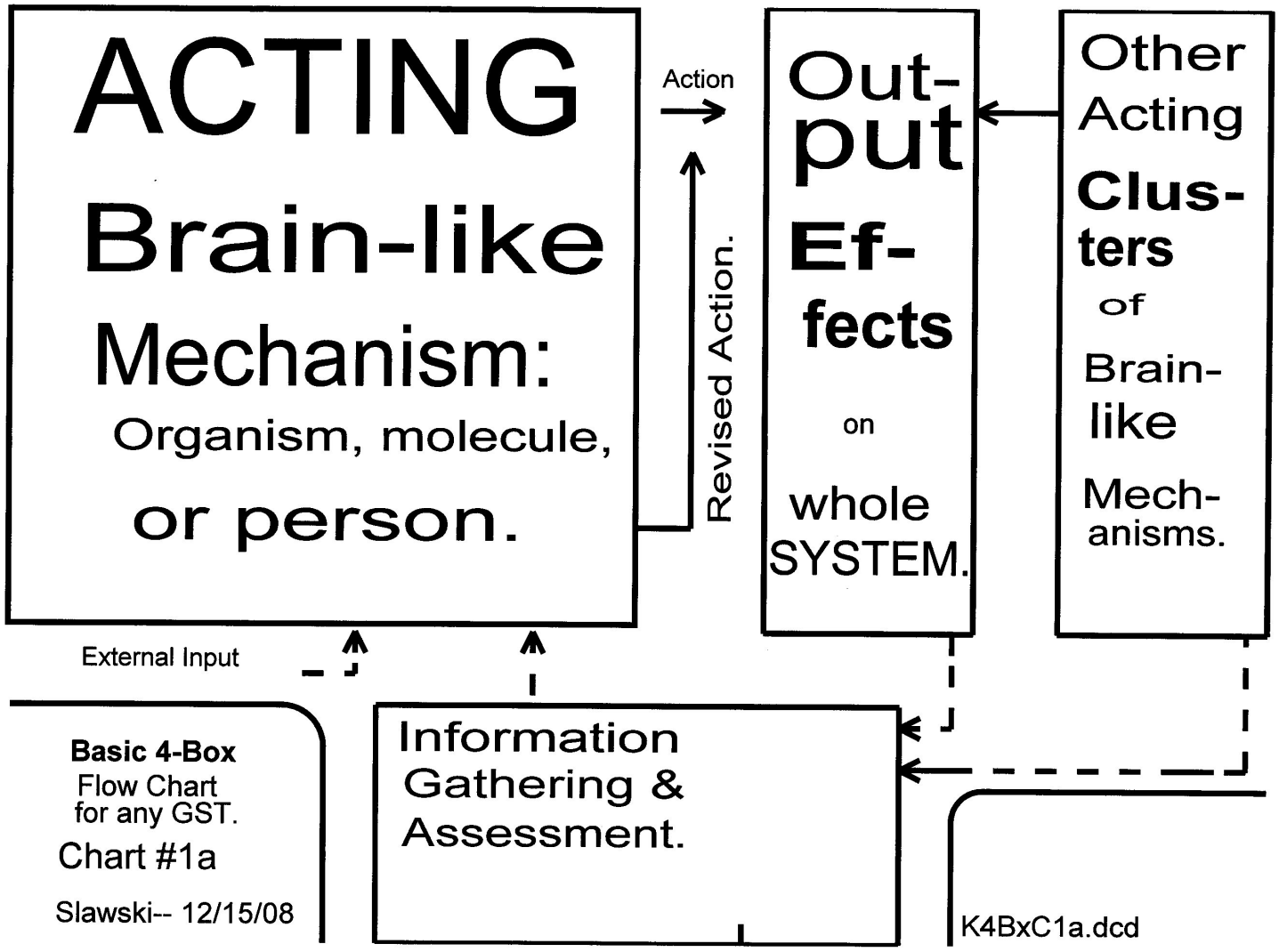
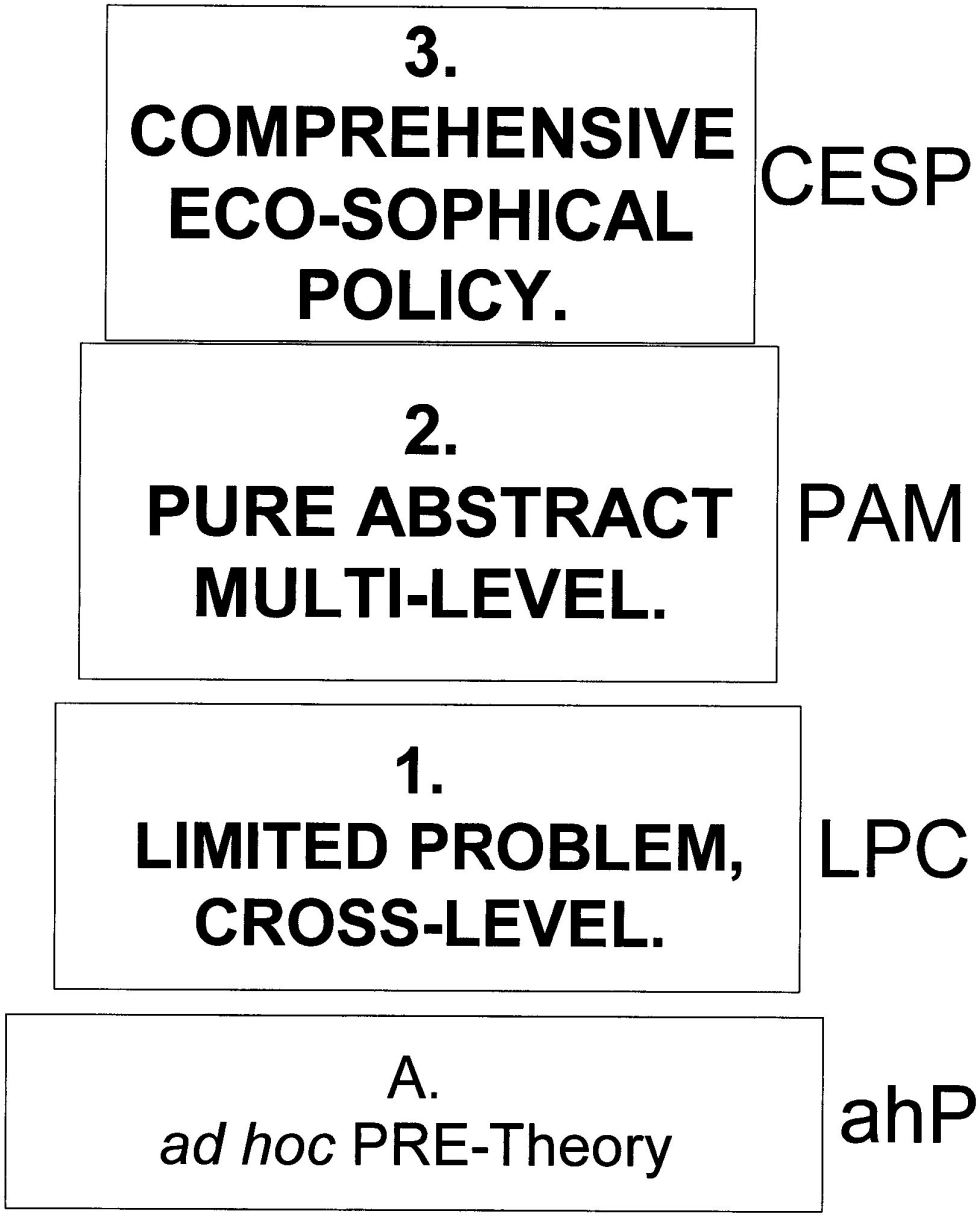

Prior NEEDS:
What WAYS must change?
Your main purpose?
Crucial DECISIONS required?
RESISTANCES to meet?
PROGRAM DEVELOPMENT LADDER?
I. PURPOSE:
Past Effects on System?
Desired Future?
Problems achieving GOALS?
II.PROB-LEM
GROUP Factors?
Helping Programs?
Other Devices?
III. PRO-GRAM
SOCIAL PROBLEM SOLVER:
Chart #1b
Slawski -- 4/06->12/08
Ways to Gather & Data?
Is FEEDBACK pos./neg.?
IV. PAST Socio-Emotional PROFIT:
4BxSps1b.dcd


ACTING
Brain-like
Mechanism:
Organism, molecule,
or person.
Action
Revised Action.
Out-
put
Ef-
fects
on
whole
SYSTEM.
Other
Acting
Clus-
ters
of
Brain-
like
Mech-
anisms.
External Input
Information
Gathering &
Assessment.
Basic 4-Box
Flow Chart
for any GST.
Chart #1a
Slawski-- 12/15/08
K4BxC1a.dcd

Levels of **"TRUE" GST**

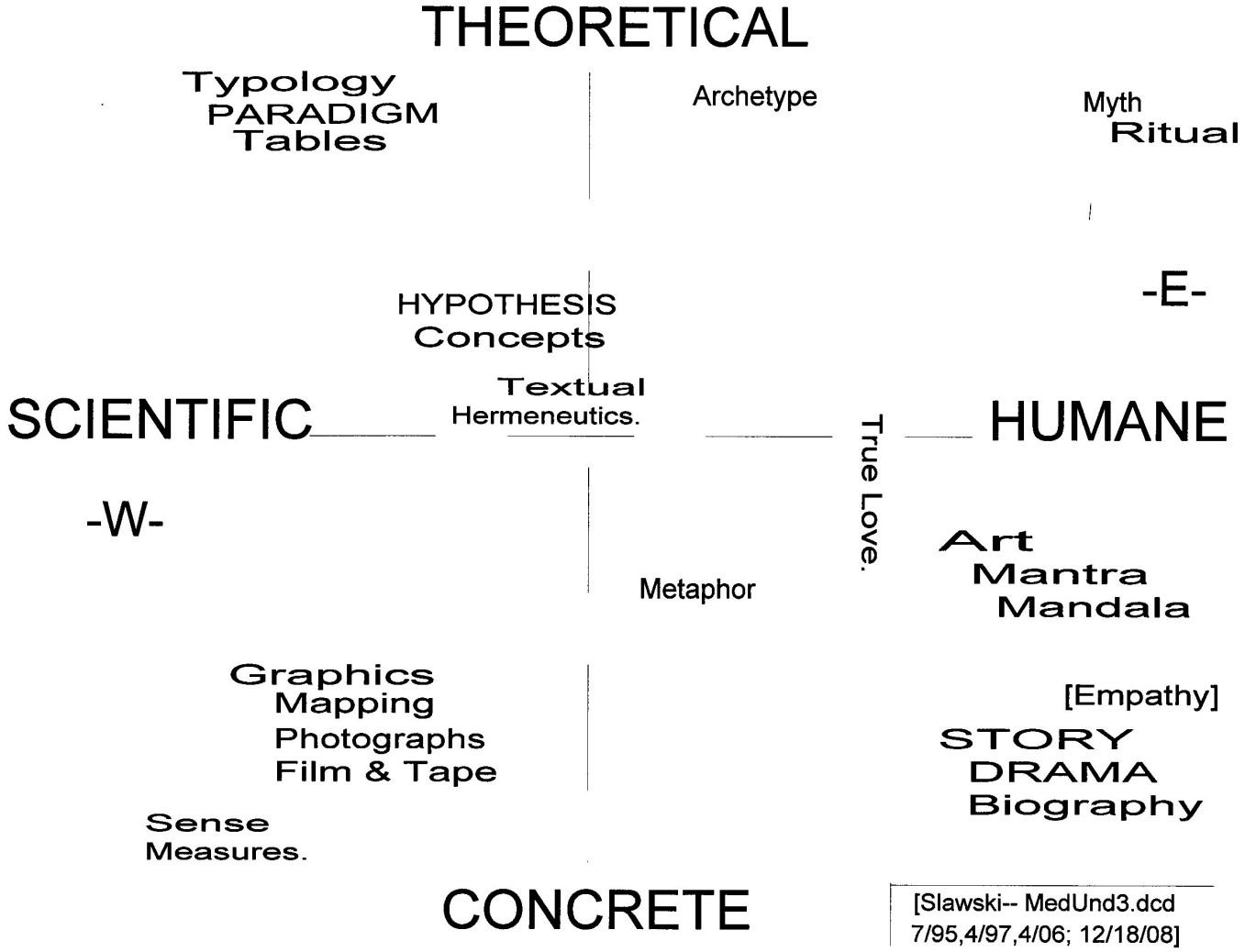
Chart #2



[Slawski --- 3+ 4/06 --> 12/16/08 --- 4LvLTth2.fc5]

*** MEDIA For UNDERSTANDING ***

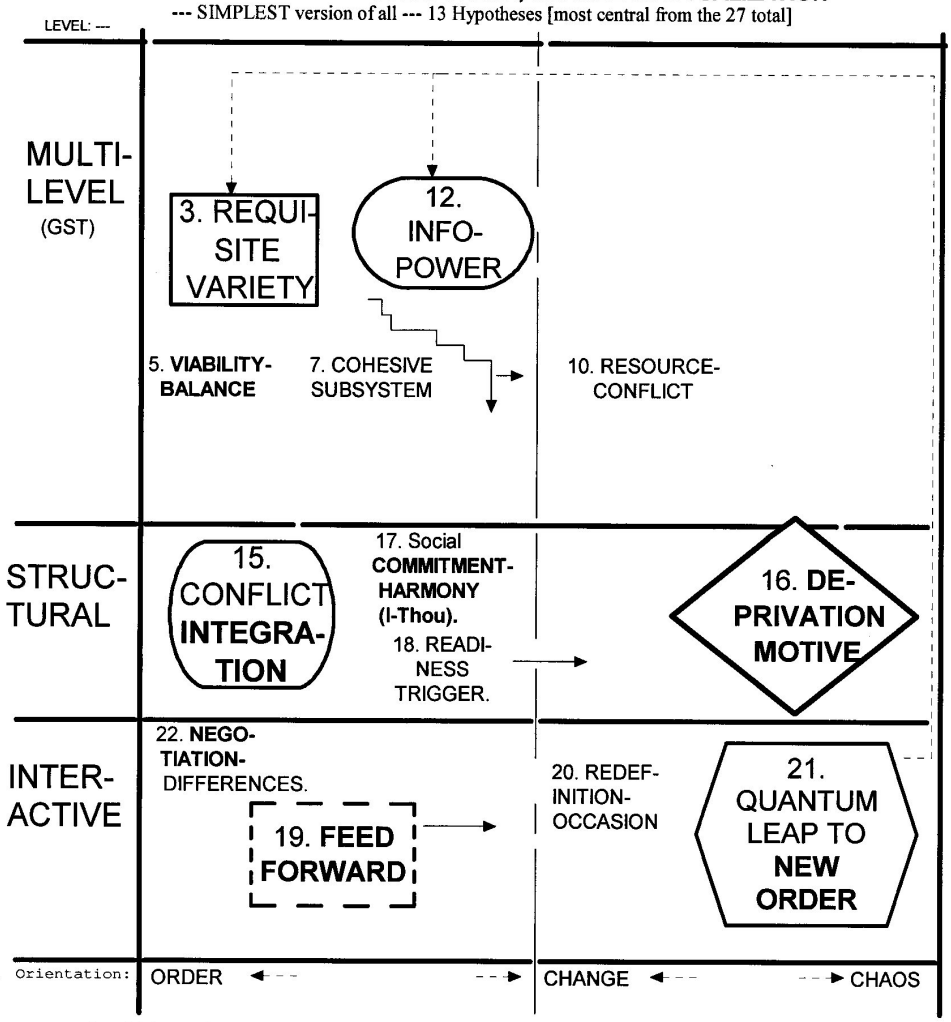
-- Chart #3



[Slawski-- MedUnd3.dcd
7/95,4/97,4/06; 12/18/08]

Chart 4a: **SYSTEMIC CAUSES: ORDER, CHANGE & ACTUALIZATION**

--- SIMPLEST version of all --- 13 Hypotheses [most central from the 27 total]



In general, within each level, the lower numbered hypotheses are the most basic. Higher numbered ones are more complex and interactive, more applicable to human interaction. The dividing line down the middle roughly divides the orientation toward order (at the left), or (in the middle) routine change, or chaos (at the right). Heavy arrows are the most logically direct routes to a new order. There are missing numbers because only 13 of 27 from the complete list are included. This version has dropped out all direct connecting arrows. Follow upper left to lower right for a loosely causal sequence. Suggestion: Evaluate by starting from upper left; move to lower right. **BOLD** letters mark key nodes of order, plus the main causes of change.

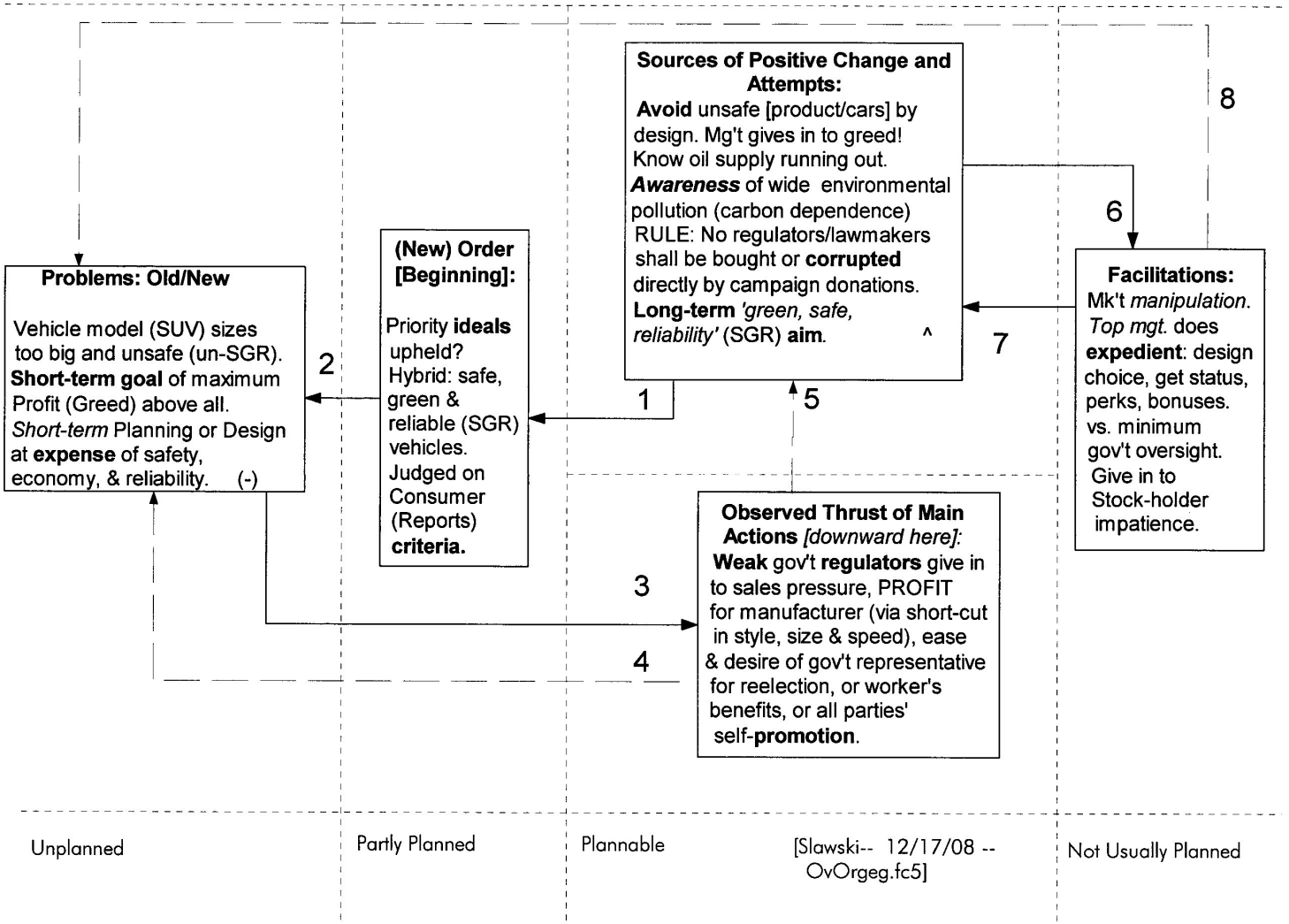
[Slawski --- ScocAc4a.fc5 -- 12/3->12/16/08]

13 CHANGE HYPOTHESES --- With PRESCRIPTIONS & Case Application: **Chart #4b**

Simplified, Generic GST *Core* HYPOTHESES:	**PROVERBS or** Corresponding **PRESCRIPTIONS:**	Applications to CASE of **AUTO-MAKERS' CRISIS.** Do own 0-4 validity RATINGS.
3. REQUISITE VARIETY: *(C) Regulator variety limits amount of regulation attainable.	Cultivate adaptation skills or mechanisms as a high priority.	Updating safe, green, reliable (SGR) design & quality control, in context of global economic environment, will increase total level of regulation of salable products.
5. VIABILITY-BALANCE: (C) Viability depends on the balance of 1) autonomy of sub-system vs. integration of system whole, and 2) stability vs. adaptation.	Cultivate a/symmetry as necessary for survival and growth.	Balance of manufacturing, distribution, and global financial systems (especially loan availability to buyers) will aid long-term reliability of product.
7. COHESIVENESS SUBSYSTEM: (C) The more cohesive each subsystem, the less cohesive the total system.	Weaken total system to make subsystem more cohesive, and vice versa.	Weakening corporate control over divisions (brands) will facilitate smaller scale innovations, sharing parts across brands.
10. RESOURCE-CONFLICT: *(C) The greater the resources available to a system, the less likely is conflict among its subsystems.	Provide sufficient resources to avoid undesirable internal (and supra-unit) conflict.	Optimizing financial allocation (including national & global financial resources & stability overall will make less competition between divisions (Chevy vs. Saturn; US vs. Japan).
12.INFORMATION-POWER: (C) The system component with the most relevant information is the one most likely to exercise power over components.	Units needing power should Seek help from the actor or unit with the most relevant information.	Safety and green (SGR) engineers should reign over style [but top brass trumped them in past for bottom line profit].
15. CONFLICT-INTEGRATION: *(C) The more conflict promotes a) increase in creativity, b) release of hostilities, c) normative regulation, d) awareness of realistic issues, and e) associative coalitions, THEN the greater will be the internal social integration, and the greater the capacity to adapt to a system's environment.	In order to adapt to a changing environment, cultivate conditions for adaptive, creative, realistic conflict, with multiple overlapping coalitions.	Constructive rivalry to optimize safety, reliability, & green technology (within a nation, or in foreign vs. US rivalries) will usually promote cooperative and profitable innovation.
16. DEPRIVATION-MOTIVE: *(C) Relative deprivation is a central motive for initiating change in relationship patterns.	Use relative deprivation as an incentive for desired change.	Envy of green car winner can motivate US automakers to develop more competitive SGR models.
17. SOCIAL COMMITMENT-HARMONY: (C) The more members of a community carry out worthy social commitments, including vocations of service, the more there will be self and social actualization.	Urge and give meaningful incentives to reach social commitment among community members.	The more industry leaders (plus buyers, investors & gov't) promote SGR cars, the more likely successful models will be built.

18. READINESS-TRIGGER: (C) When the social structure is strained and psychological readiness is peaked, then any convenient trigger may induce change.	To induce change, wait for the right moment to trigger it, social, psychological, or physical.	Due to the current period of economic stress, the more likely will the near future be a time of constructive innovation.
19. FEED-FORWARD: *(C) When there is constructive feedforward, then the most influential actors will likely promote an improved, even a more newly enlightened, ecological and social order.	Cultivate appropriate feedforward to promote an optimal new order.	When most design plans see years into the future, the more efficient will be the bulk of products (auto models).
20. REDEFINITION OCCASION: (C) When the parties redefine the situation, then new patterns will occur.	Redefine the situation to allow desired new patterns to occur.	During times of redefinition of market desires (like current 2008-09 financial crisis), there will be a push to a majority of SGR cars.
21. QUANTUM LEAP TO NEW ORDER: (C) When there is broad but workable perturbation, together with a ready critical mass of proponents, then there will more likely occur a quantum leap.	Workable disturbance, with ready carriers of the message (or intent), can promote a quantum leap to a better order.	Economic or financial disturbance accompanied by good and valid PR will promote the likelihood of a significant change to a majority of sales for SGR vehicles.
22. NEGOTIATION-DIFFERENCES: *(C) Ability to negotiate differences will promote harmony and understanding.	To promote unity and understanding, practice the art of negotiation.	Leaders' (CEO's & gov.) ability to negotiate financial bailout now with independent oversight and verification will lead to joint SGR aims among auto industry leaders and buyers.
See more complete statement of hypotheses in author's 1995 ISSS Proceedings paper, "A General Theory..." *(C) = Radically Central Hyp. [6 in number here].	*** Among the above 3 groups from the original 27 hypotheses, Nos. 1-14 fall largely into the FACTISM paradigm, which includes GST. BEHAVIORISM encompasses hyps. numbered 15-18. DEFINITIONISM encompasses 19-27. (C) = in short *Diagram* [of 13, in 1996 paper were marked (D) in chart list of 27].	Slawski -- 13GtHyAp.doc, 12/18/08; from ...Vi: 596, +1096+ 397+899, 3+ 4/9/06. Hyps. extracted from Miller (1978), Clemson (1985), and Mattessich (1982), as told in Slawski (1995).

Chart #5a: Generic Elements of A TRUE THEORY: INSTITUTIONALIZING INNOVATION in an Organization (with examples)



INTERRELATED BREAKOUT HYPOTHESES

From the Core of "Institutionalizing Innovation in an Organization"--- Chart #5b:

H#1 [prior #5, Slawski 1975]: The skill (and power used) in attempts to implement a **practical plan** will determine the success of the proposed new order.

H#2 [prior #2]: The presently existing form of social order produces or facilitates certain kinds of **social** (or organizational) **problems**.

H#3 prior 2A & 2B]: Problems (in the organization, old or new) will significantly affect the **thrust of main actions** in the situation (under present analysis).

H#4 [prior 1I]: Virtually any resulting pattern will eventually lead to **new problems**.

H#5A [prior 2E & 2F]: **Demands** for **change** tend to **reach the elite** (directly or indirectly).

H#5B: **Demands for the status quo** will also be communicated to the elite (in due time).

H#6 [prior 3H: An independently conducted **self-study** seminar (or simulation-game, as a form of OD or "organizational development") will facilitate the development of a set of effective policy planning meetings and an unbiased report.

H#7A [prior 3H, 4D & 4F]: Existing **mutual trust** between parties will facilitate the setting up of a self-study seminar (or simulation).

H#7B: **Reform leadership** (on a more global perspective) is more likely to be acceptable to the elite (organization or government leaders) than will **self-styled** (or individualistic) leadership.

H#7C: **Representative reform leadership** is more likely to favor and promote the institutionalization of effective self-study seminars (or simulations).

H#8 [prior #6]: **Early socialization** (in childhood and within an organizational subculture) will strongly affect current **value conflicts**.

Chart #5c: Concluding (tentative) **RECOMMENDATIONS**:

The following generic conditions for successful innovation are generic and not yet applied to a specific case (such as the auto industry's current (2009) financial crisis).

[For the sake of future comparison and research, the numbers of hypotheses below are taken directly from Slawski's original paper on "Institutionalizing Innovation in an Organization" (1975: pg. 51f.)].

Based on this model, with its hypotheses and case studies, it seems appropriate to at least suggest in summary fashion some insights and recommendations on how to facilitate the innovative process. The following guidelines will hopefully be a useful checklist for administrators and change agents alike. These recommendations are only intuitively and indirectly derived from the model. Hence they are subject to much revision and reorganization as time and experience dictate. The most direct and simple way to present the recommendations seems to be as **prescriptive rules of thumb.** The limited number of hypotheses here has been sifted down to the current most applicable list but do not correspond to the numbering used in flow Chart # 5a.]

*3. Attempts to initiate change must be preceded by serious **planning** of strategies, contingency plans, a possible grand design for administrative implementation, and **tactics** for convincing each level in the bureaucracy of the necessity and desirability of making your proposed changes.

A. "Non-negotiable demands" in this context have little chance of success.
B. Basic conflicts of values and interests must be brought out into the open and dealt with as explicitly as tact and empathy allow.
C. Even the most reasonable of persons are inevitably limited in their perspective by their life experience and early socialization.

*6. **Obfuscation** and peremptory termination of issues by managers or secret committees are dishonest and reprehensible means of handling serious issues.

A. There can be **no trust** in either direction under such conditions.
B. A very high degree of **consistency** in administrative decisions and pronouncements is the only way to avoid confrontation and extended or destructive **conflict**.

*7. Members of the management when operating **without effective oversight** [or sunshine, the class of decision makers, for their own self-serving political purposes, or out of fear of social or organizational change (See 1975: pg. 52, A-F)] may ignore communications made to them.

*8. Management is more likely to *respond when* the communication is reasonably stated, easy to comply with, requires little time or effort, when the request doesn't cost anything, when it is politically neutral, or when it reinforces the status quo or asks for changes or action that will generate favorable publicity for the institution or the managers in charge.

*10. **Rigid** adherence to bureaucratic rules must take second place to serious **open-minded** attempts to initiate and implement change. The spirit is more important than the letter of the law. [1975, pg. 75: A-B, subordinated points.]

*15. The bargaining process should so far as possible emphasize the greater **joint payoffs** of the proposed change for both (or all) parties involved (say the worker bloc vs. managers) rather than separate (or zero-sum) payoffs.
[16.A. An **ombudsman** may help, but not meet deeper needs for the ongoing exercise of power from the bottom.]

19. Trust is established by subjects toward managers when 19: A-H occur (1975, pg. 51).
A. Administrators follow a consistent policy, clearly stated.
B. They have secure, balanced personalities.
C. They are sincerely interested in communicating with managers and workers 9or line and staff members).
D. They are open to suggestion by underlings.
E. They avoid needless delay.
F. They put in the time and energy to implement the reasonable wishes of subjects.
G. They have adequate material resources and staff to investigate alternatives and carry out innovative policy decisions.
H. They have the support of higher administrators for granting the petitioners' requests.

20. Trust is established in managers toward workers when: A-E occur (1975, pg. 51).
A. Subjects or petitioners (managers and workers) make reasonable requests in a reasonable manner.
B. Subjects have good self images.
C. Subjects are patient with the exigencies of bureaucracy.
D. Subjects are willing, able and effective in helping to implement and publicize the requested changes, once approved..
E. The payoff resulting from the innovation is perceived to be at least as regarding for the petitioner as for the administrators who grant the requests.

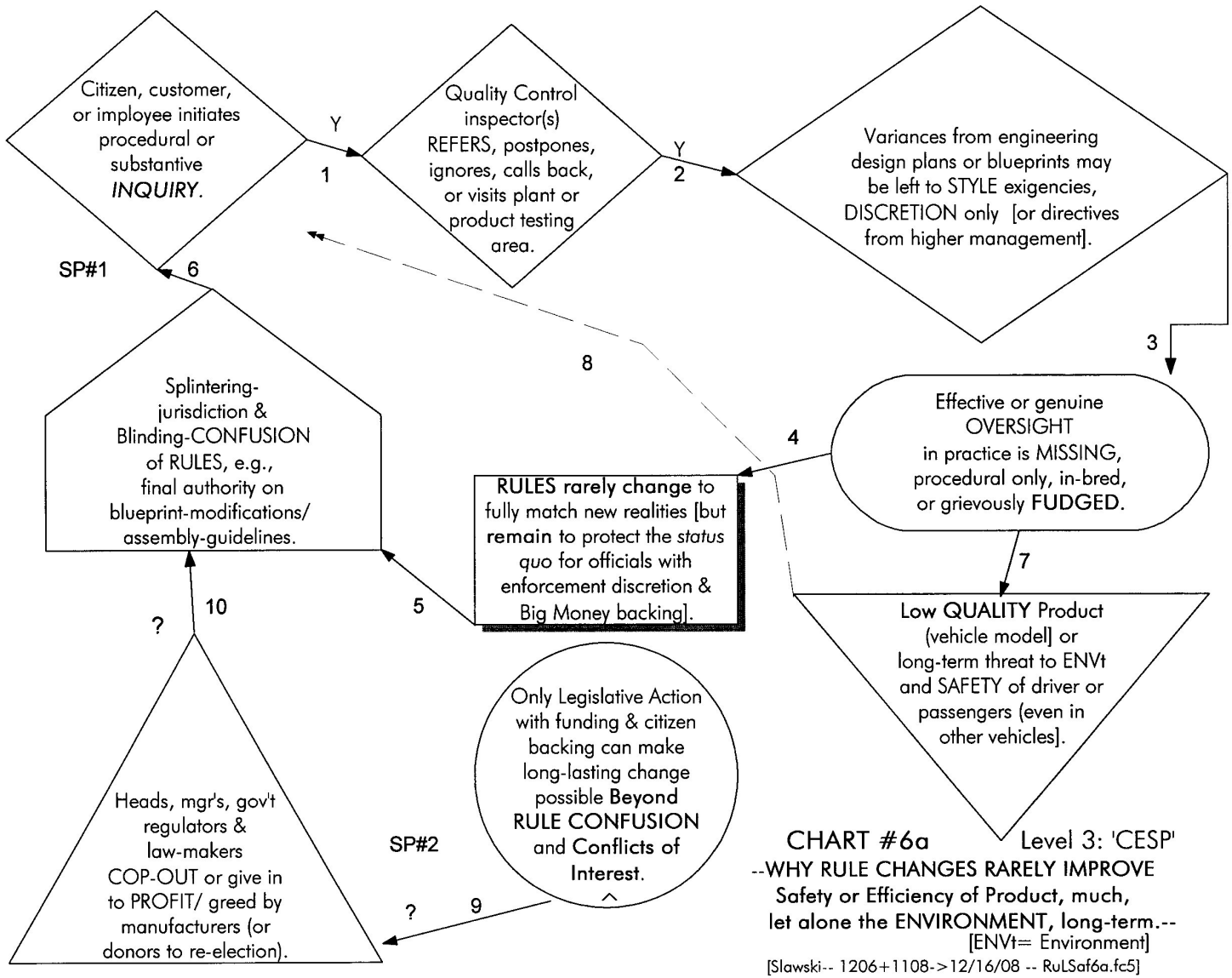


CHART #6a Level 3: 'CESP'

--WHY RULE CHANGES RARELY IMPROVE Safety or Efficiency of Product, much, let alone the ENVIRONMENT, long-term.--

[ENVt= Environment]

[Slawski-- 1206+1108->12/16/08 -- RuLSaf6a.fc5]

--- HYPOTHESES ABOUT "RULE CHANGES": Chart #6b ---
For Decision Tree & Flow Chart [#6a, i.e., <RuLSafA.fcd>], as
An Example of Theory Level #3 --- 'CESP'
(with terse illustrative references to the auto industry).

The following hypotheses correspond to the ten numbered arrows connecting variables (or situations described in summary inside those figures) in Chart # 6a.
["SP" in flow diagram locates possible logical Starting Points for analysis or application of the whole picture.]

1. If a citizen, customer, or employee initiates a procedural inquiry in a large organization, and the points of inquiry are accepted by the organizations representatives for investigation, then **Quality Control** inspector(s) [or the department of Risk Management] will either REFER the issue(s), postpone, ignore, promise to call back, or to visit the manufacturing plant or investigate at the product testing area.

2. As a result of such a referral, and if and when it is carried out (in the case of new automobile design issues), variances granted from the original engineering design plans or blueprints may be left to "style" exigencies, to **"discretion"** only, or perhaps to directives given from higher management.

3. When such variances are granted (officially or tacitly), genuine and effective **"oversight"** is likely to be **"missing,"** taken as only a procedural matter, perhaps in-bred (among the hierarchy of managers), or even grievously **"fudged"** in its effects.

4. If such **oversight is fudged**, the underlying or governing "rules" to maintain standards (of safety and long-term effectiveness or efficiency of the product) rarely change to fully match the new (or even long-standing) realities, but instead remain in order to protect the **status quo** for officials with enforcement discretion and Big Money backing.

5. When rules remain static (despite evident need for change and adaptation) it is likely that there will result a **splintering of jurisdiction** (over apparent discrepancies) and a blinding **"confusion of rules,"** such as who has final authority on blueprint-modifications or product assembly guidelines.

6. Confusion of rules (and its correlates, as above in hypothesis #5) leads to **new** procedural or substantive **inquiries** (starting again at hypothesis # 1 above).

7. When oversight is missing or fudged, the product (or vehicle model), or long-term threat to the **"environment" and "safety"** will be **compromised** (for the driver, or passengers inside or in other vehicles involved in a potential accident).

8. **Low** (or inadequate) **quality** of the product may feed back [dashed line on chart] directly to **new** (procedural or substantive) **inquiries**.

9. If (as seems to be the case that) only legislative action with adequate funding and citizen backing can make **long-lasting change** possible **beyond** "Rule Confusion" and "Conflicts of Interest" [the critical lever for change in the whole system], such an appropriate form of **policy** and lawmaking may induce the managers, department heads, government regulators and law-makers to **"cop out"** or give in to "profit" or **"greed"** by the manufacturers (or potential or actual previous donors to re-election to pertinent effected offices).

10. Cop-outs or **profit-chasing** is likely to lead to further **"confusion of rules."**

    And the cycle restarts *ad infinitum.*

Again, SP#1 and SP#2 (on the chart) are possible re-starting points for analysis of the type of situation represented here overall.

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Again, SP#1 and SP#2 (on the chart) are possible re-starting points for analysis of the type of situation represented here overall.

COMPARATIVE RATING TABLE: Chart #7a

Good Theory Criteria below:	Theory #1	Theory #2
1. **TESTABILITY** or **Ease of Application:** [Looking + Scaling]		
2. **INFORMATION VALUE:** [Describe WHAT.]		
3. **PREDICTABILITY** [T1 + E →T2: WHEN?]		
4. **EXPLANATORY POWER** [WHY?]		
Total Scores:		

Scale: (0-4), 4 being "high" on each criterion.
Justify each rating number with explicit verbal description.

33 CRITERIA FOR APPRAISING A "PROCEDURE" or THEORY: Chart #7b

Rate system on 33 items, 0-4, 4 being High. Reasons "over."	#	THEORY #1	Theory #2	Theory #3
I. THE PROCEDURE SHOULD "AID CONCRETE PROBLEM SOLVING" ---	*			
A. EASE OF APPLICATION or TESTABILITY:	*1			
1. Common sense (agrees with basic facts).	2			
2. Relevancy (to description of the consulting context).	3			
(a) Generates testable and fruitful hypotheses.	4			
(b) Formal, clear Causal/Developmental Hypotheses.	* 5			
B. INFORMATION VALUE:	* 6			
i.e., PROCEDURE/ Sequence aids description of facts.				
1.Credibility (or "consonance between the model builder and the HELPER," with critical viewpoints).	7			
(A) Treats Wholes with Parts in Changing Relationships (is holistic, not reductionistic).	*8			
1) Clears alternate points of view and levels.	9			
2) Accounts for minority, deviant, critical, or "emancipatory" ideas, IS vs. OUGHT; or SIGNIFICANT OTHER to Helpee.	10			
(B) Congruence between stated and effective PRACTICES,	11			
(C) Degree effects of PROCEDURE are known & fed back.	12			
2. Accessibility (making the model's "input and output familiar and intelligible").	13			
(A) Promotes full communication about HELPEE'S life/career.	14			
(B) Promotes interaction between leaders and members.	15			
(C) All PARTICIPANTS contribute to PROCEDURE change.	16			
(D) Promotes morale in the organization/collectivity.	17			
3. Distortion (between model and reference system).	18			
4. Tractability (or ease of utilization of the model).	19			
5. Structural integrity (displaying a "model design based on internally consistent principles").	20			
C. PREDICTABILITY:	*21			
[Knowing early facts (T-1) plus crucial EVENT, does the used PROCEDURE help predict later outcomes (at T-2)?]				
1. Reproducibility (in other HELPING settings).	22			
(A) Generalizable (to other situations).	*23			
2. Efficiency ("costs of operating the model").	24			
(A)Helps achieve greater productivity.	25			
3. Flexibility ("model design can undergo change").	26			
(A) Guidelines for re-education, creativity, or novel.	27			
(B) Promotes cooperative group practices.	28			
(C) Innovative potency (even to Quality of Life).	29			
II. TRUE, AND GENUINE GST THEORY in General ---				
D. EXPLANATORY POWER (reasons WHY change occurred):	*30			
1. Isomorphic with regard to concepts and hypotheses.	*31			
2. Unifying capability for synthesizing alternate theories.	*32			
3. Specific Reasons or intuitive basis for the Process of Change. This last equates to how much data the theory explains.	*33			
SUMMARIZE with an OVERALL Rating here --- >				

[Slawski – 33Crtx7b.doc – 4/25/06→ 12/26/08] Starred items (*) are more basic.