ADVANCING THE SOCIAL SCIENCE PARADIGM SHIFT: BOULDING'S TYPOLOGY, TPO THEORY, AND THE TRIPLE ACTION ROUNDTABLE

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ABSTRACT

Paradigm shifts are slow to achieve. Even a paradigm shift in the hard science of astronomy, from geocentrism to heliocentrism, took centuries and great controversy for scientists to prove, and for society to accept. The new understanding, that the earth revolves around the sun and not vice versa, turned astronomy on its head, resulting in the need for reconceptualization and recalculation at all levels of theory and practice.

Evolution in the soft sciences, management and education theory, is even slower and more complex. Centuries ago, patriarchs had unlimited power over people under their care. Bureaucracy, an improvement over patriarchy, gave workers power over their personal lives. However, bureaucracy still assumed supervisors had the knowledge that had to be installed in the supervised. New paradigms such as participatory management and cooperative learning see workers and students as active participants in their workplaces and classrooms. This paradigm shift is still uncertain. The pendulum may swing too far, or there may be erroneous traces of the old paradigm. Corresponding examples are: 1) *Teachers praise all students (workers too)*. This can result in equal treatment of mediocre and excellent work and lowered standards. 2) *Cooperative students are obedient students (workers too)*. *Cooperative* is typically taken to mean obedient, an old-paradigm virtue. The true meaning of *cooperative* is working together, as observed in the prefix and word root—co and operative.

The dilemma in social system theory is ancient too. Plutarch in the first century said, "The mind is not a vessel to be filled, but a fire to be kindled." Twenty centuries later, Boulding's typology and TPO Theory advance the paradigm shift in the soft sciences of management and education significantly. They resolve the either-or conflict, provide the new unifying question and then answer it. In other words, the old/new paradigm dilemma "Which is right, *top-down directive* or *bottom-up participatory* policy?" (Cf. *directive*: controlling the supervised who are empty vessels to fill; or *participatory*: flexibility for the supervised who are fires to be kindled). The answer is "both." The new question clarified by Boulding's Typology is: "Which *parts* of a social system need to be controlled, and which *parts* left flexible?" Condensing Boulding's nine system types into three, TPO Theory answers that "*THINGS* need to be controlled and *PEOPLE* need flexibility for best *OUTCOMES*." Good indicators for effective social systems become *adjustment capacities*, hence a thermostat metaphor. We are still trudging, stumbling, and evolving toward a new *systems paradigm*, which incorporates both old and new paradigm traits. The new understanding, that both directive and participatory methods are needed, that things can be controlled but people behave according to interiorly prescribed criteria, results in the need for reconceptualization at all levels of theory and practice.

A Social Science Paradigm Shift: Boulding, TPO Theory, and the RoundTable

Science is interested in behavioral laws and causes. Whether cause relates to gravity or human agency, both paradigm shifts here are proposed as hard science--a result of extensive empirical observation, rather than speculation.

This *systems paradigm* underpins the "Triple Action RoundTable," a proposed super tool for systemic school/workplace renewal. The tool's three prongs are: 1) RoundTable—a whole group activity with equal-turn democratic communication; 2) TPO Thermostat Guide—a thermostat metaphor for leaders to view and manage three modes of their organizations: OFF (planning); ON-Manual (agenda/resource delivery), and ON-Auto *(*maintaining the optimal work environment--metaphorically around 68 degrees—for participant self-regulation); and 3) Triple Bottom Line (3BL). 3BL corporations have *financial*, *social*, and *environmental* bottom lines, thus accountable for their impact on the whole society. Similarly, 3BL educators consider the whole learner: his/her *cognitive*, *affective* and *psychomotor* development. Respectively, these three prongs are 1) bottom-up; 2) top-down; and 3) in-out-in (i.e., current goals-3BL ideals/goals/intended outcomes-observed outcomes).

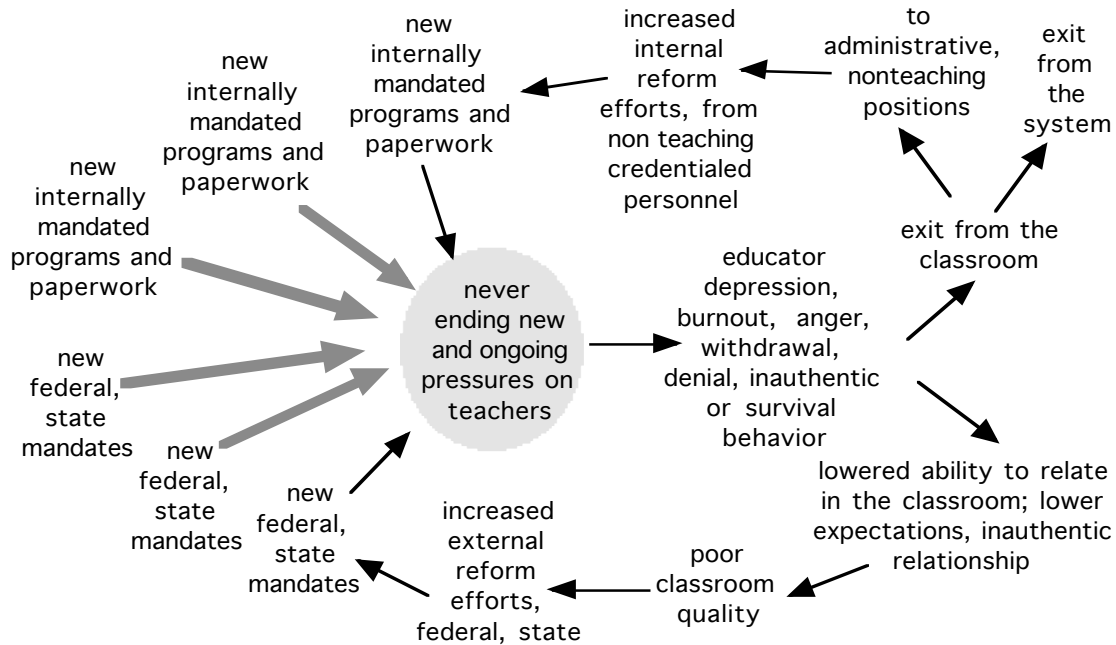Keywords: social system design, paradigm shift, educational systems design

BACKGROUND

My interest in paradigm shifts and systems thinking was crystalized in postgraduate school after a 20 plus year career as a secondary school teacher in Los Angeles, California. Inside the classroom, I had had wonderful students, and my satisfaction and skills had increased each year. Outside the classroom, there were ever-increasing reform efforts--requirements, programs, and other influences--that left my colleagues and me overwhelmed. In an attempt to understand the increasing problems I had experienced in public education, I explained and illustrated my experience of school problems as a cycle of increasing negative outcomes that seemed to increase exponentially.

Figure 1 illustrates the cycle of increasing negative outcomes I had experienced. Never ending, ongoing and new pressures on teachers (gray circle) result in lowered ability in the classroom (the lower clockwork cycle), or exit from the classroom to administrator roles (upper counter clockwise cycle), or exit from the system. Lower classroom quality resulted in external and internal reform efforts, which increased each year. I came to learn that my personally experienced cycle of increasing negative outcomes was a "systems view" and a serious negative outcome was hyperbureaucracy.

I further reasoned that if a simple traditional scientific approach worked for schools, adding a reform effort would improve them. I am imagining a traditional formula, very simply, to be something like $18 + 1 = 19$. However, what was happening was more like $18 + 1 = 17$. I concluded that there must be a new, different scientific law at work. I came to understand this as a need for a paradigm shift.

A Social Science Paradigm Shift: Boulding, TPO Theory, and the RoundTable

new internally mandated programs and paperwork

new internally mandated programs and paperwork

new internally mandated programs and paperwork

new internally mandated programs and paperwork

increased internal reform efforts, from non teaching credentialed personnel

to administrative, nonteaching positions

exit from the system

exit from the classroom

never ending new and ongoing pressures on teachers

educator depression, burnout, anger, withdrawal, denial, inauthentic or survival behavior

new federal, state mandates

new federal, state mandates

new federal, state mandates

increased external reform efforts, federal, state

poor classroom quality

lowered ability to relate in the classroom; lower expectations, inauthentic relationship

Figure 1. Cycle of Increasing Negative Outcomes
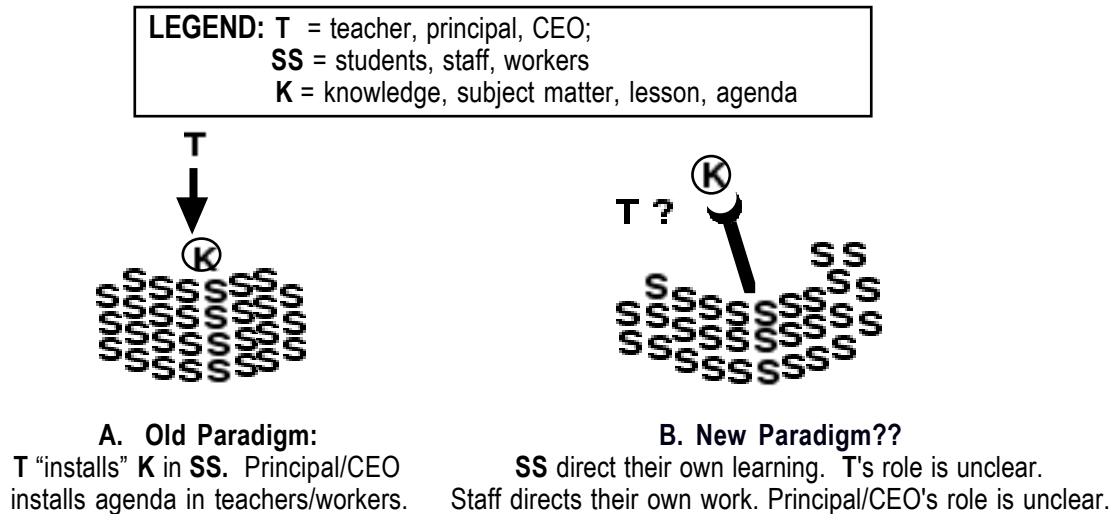
Paradigms and Paradigm Shifts

Paradigm shifts are slow to achieve. Even a paradigm shift in the hard science of astronomy, from geocentrism to heliocentrism, took centuries and great controversy for scientists to prove, and for society to accept. The new understanding, that the earth revolves around the sun and not vice versa, turned astronomy on its head, resulting in the need for reconceptualization and recalculation at all levels of theory and practice.

Evolution in the soft sciences, management and education theory, is even slower and more complex. Centuries ago, patriarchs had unlimited power over people under their care. Bureaucracy, an improvement over patriarchy, gave workers power over their personal lives. However, bureaucracy still assumed supervisors had the knowledge that had to be installed in the supervised.

The seed for a paradigm shift in social system theory is ancient too. Plutarch in the first century said, "The mind is not a vessel to be filled, but a fire to be kindled." New paradigms such as participatory management and cooperative learning see workers and students as active participants in their workplaces and classrooms. This paradigm shift is still struggling and muddled. The pendulum may swing too far. An example: *Teachers treat all students equally*. This can result in equal treatment of mediocre and excellent work and lowered standards. On the other hand, there may be erroneous traces of the old paradigm. An example: *Cooperative students are obedient students*. *Cooperative* is typically taken to mean obedient, an old-paradigm virtue. The true meaning of *cooperative* is working together, as observed in the prefix and word root—co and operative. One result is that the role of the leader is unclear. Figure 2A illustrates the old

paradigm that the leader installs knowledge in the led. Figure 2B illustrates the led as active participants, fires to be kindled. However, it is unclear in the new paradigm how that is to be accomplished--how those fires are to be kindled.

> **LEGEND: T** = teacher, principal, CEO;
> **SS** = students, staff, workers
> **K** = knowledge, subject matter, lesson, agenda

A. Old Paradigm:
T "installs" **K** in **SS**. Principal/CEO installs agenda in teachers/workers.

B. New Paradigm??
SS direct their own learning. **T**'s role is unclear. Staff directs their own work. Principal/CEO's role is unclear.

Figure 2. The Old and New Paradigms. in Education and Management

Traditional Scientific Thinking versus Systems Thinking in Organization Theory

An understanding of schools, school processes, and outcomes, requires systems thinking. Traditional scientific thinking derives from a linear, monocausal, cause-effect model. When applied to human organizations, it assumes that policy determines structures and processes, which are implemented invariably by participants and lead to predictable outcomes. These are the assumptions of the bureaucratic model, illustrated in figure 3A. In contrast, figure 3B illustrates that basic systems thinking assumes that all variables are connected and influence each other.

A. Monocausal thinking
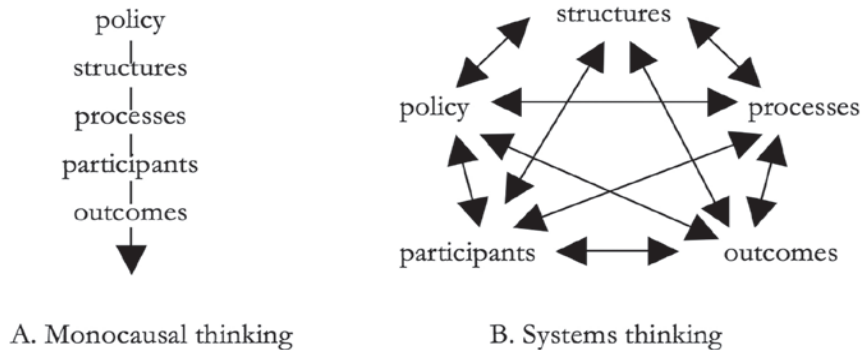
B. Systems thinking

Figure 3. Assumptions of Monocausal Scientific and Systems Thinking

Figure 3 is an oversimplification, but a good beginning point. Large, complex systems especially require systems thinking. In shifting from traditional linear or monocausal thinking to systems thinking, certain concepts, factors, or properties become key.

Specifically, when analyzing or describing a complex system, systems thinkers identify the *system-in-focus*, *subsystems*, *supra-systems*, and *environment*. As an example, when the *system-in-focus* is a classroom, its *subsystems* would include the teacher, students, materials, tests, and activities. Its *supra-systems* would include the grade level, school, and the school district. Its *environment* would include the neighborhood, city, and so forth.

Other key concepts that systems thinkers identify are *structures*, *processes*, *outcomes*, and *boundaries*. Continuing the classroom example, its *structures* would include the room, chalkboard, textbooks, and participant roles (i.e., teacher, student); its *processes* would include the classroom activities; its *outcomes* would include student achievement. Its *boundaries* would include the walls of the classroom, the scope of the lessons, the student characteristics (e.g., fourth grade, not third or fifth), the class hours (e.g., 8:00 to 3:00 p.m., Monday through Friday), and more.

Getting from Linear, Monocausal Theory to Human Social Systems Theory in Three Steps

The contrast in figure 3 of monocausal scientific thinking and systems thinking is useful as a first step to understanding the difference between linear and systems thinking, but it is still inadequate for a general systems theory of social systems such as schools. A passage from Bolman and Deal (1990) will be offered to identify the second and third steps.

> Systems theory … has demonstrated that it has significant, though nonspecific, heuristic value, and it comes closer than any other body of theory to becoming a general theory of systems. In the very long run, a general theory is the likely direction for research and theory … however … Systems theory, because it aspires to encompass *all* systems, has not developed concepts that are specific to *human* systems. (p. 232)

Thus, a second step to a general theory of social systems is to understand general systems theory as a theoretical framework that can overarch and unify the relevant disciplines. This is illustrated in figure 4.
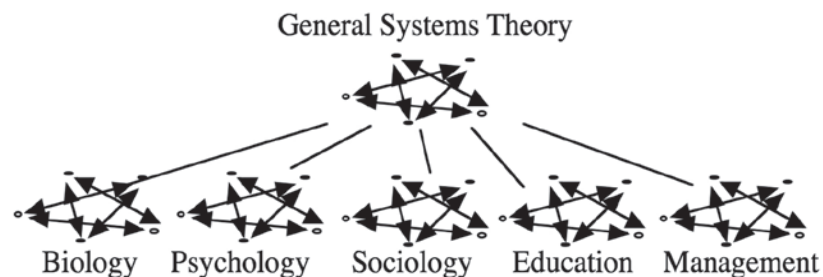
Figure 4. General Systems Theory: A Framework to Overarch and Unify the Disciplines

A third step to a general theory of social systems is to develop and use concepts and terms that are specific to, and work for, human systems, and the purposes here, for social systems such as schools and organizations. With this aim, I (and many others) propose the term *agent* or *agency* to replace the scientific term *cause*. *Cause* is a limited term when used for explaining human social systems because it assumes a neutral unconscious agent. In other words, things or events are causes. The term *agent* is better because it is a general term that includes a cause that is either unconscious and neutral (things, events) or human and value-laden (people). I will clarify what I mean by the following examples.

> *John was the cause of the new red-dot policy:* This sentence might sound like John was unintentionally responsible for the new policy. Perhaps John came late to work every day, and finally a new policy was implemented that the front office secretary would put a red dot on the sign-in sheet for those who report to work late.

> *John was the agent of the new red-dot policy:* This sounds like John was intentionally responsible for the new policy. Perhaps John was the principal or CEO. He saw others coming late and decided to introduce the new policy of punitive, incriminating red dots.

Overview of System Methods

Flood and Jackson's system of system methods (1991) is a useful organizing framework for all this complexity. The system of system methods was not developed for schools but for the workplace and the business world. However, it was especially enlightening as it provides an overview of the history of systems methods and their assumptions as applied to organizations. As mentioned and illustrated in figure 3, systems thinking and systems methodologies are associated with an explicit shift in scientific assumptions from the value of seeking a single cause to the assumption of multicausality and interactivity. The system of system methods is a typology of systems methodologies (also called methods) for both human social systems analysis/modeling (that is, describing an organization) and human social systems change (that is, prescribing for an organization—the intervention or design process). Table 1 presents the Flood/Jackson typology.

In the far-left column, table 1 row A, organizations can be viewed as simple. In other words, organization processes are assumed to be clockwork- like and predictable, with simple feedback loops. These represent the earliest systems methods and assumptions.

In row B, organizations can be viewed as complex. In other words, organization processes are assumed to be interactive, non clockwork-like, and unpredictable, as well as multilevel (e.g. students, classroom, school, school district).

In the very top row of table 1, organization participants can be viewed as having goals and relationships that are unitary (column 1), for example, bureaucracy. Bureaucracy spells out no assumptions about employee goals; therefore it assumes that all workers' goals are the same.

Participants can be assumed to have plural goals. Along with the concept of soft systems,

organization analysts came to understand that participants have many goals (column 2). Analysts and designers then came to understand that, in complex organizations, participants have coercive and conflicting goals (column 3).

Table 1. A System of System Methodologies, a Robust Theoretical Framework

Participants' goals as.. / Organization processes as...	[1] ...UNITARY (hard)	[2] ...PLURALIST (soft)	[3] ...COERCIVE (soft)
[A] ...SIMPLE	• OR-Operational research • SA- Systems analysis • SE- Systems engineering • SD- System dynamics	• SSD- Social system design • SAST- Strategic assumption surfacing & testing	• CSH- Critical systems heuristics (and emancipatory systems thinking)
[B] ...COMPLEX	• VSD- Viable system diagnosis • GST- General systems theory • Socio-technical systems thinking • Contingency theory	• IP Interactive planning (containing Ideal System Design- ISD) • SSM- Soft systems methodology (with ISD)	

Note: From *Creative Problem Solving: Total Systems Intervention* (p. 42), by R. L. Flood and M. C. Jackson, 1991, Chichester, England: John Wiley & Sons, Ltd., Copyright 1996 by John Wiley & Sons, Ltd. Adapted with permission.

Jackson's typology organizes thirteen system methodologies into six types (six cells in table 1). I have shaded the cells of early systems methods. The methods I place in clear cells are the most current and suitable methods for systemic change/intervention/design in organizations in spite of the fact that the typology is twenty years old.
Recent Updates. It is twenty-some years since the table 1 version of the system of system methods. Systems thinkers and designers have continued to grow and evolve in experience and sophistication, and their methods have evolved and changed. In spite of the twenty years that have passed, the system of system methods table remains current with some updates. Jackson explains some of the updates as follows:

> SOSM [or SSM] belongs in the simple-pluralist quadrant because it pays no explicit attention to the complexity arising from systems themselves and how we can respond to that. Only Ackoff's IP tries to consider complexity arising from both . . . levels of analysis and participants' perspectives. Second, I put "critical systems thinking" in the complex-coercive cell. It tries to employ all the other systems methodologies in combination, according to their strengths and weaknesses, in situations of this level of complexity. (M. C. Jackson, personal communication, May 28, 2013)

Jackson further points out that the complexity in understanding and managing schools and organizations arises as much or more from the great diversity in participant perspectives (i.e., top row table 1), rather than levels of organization (i.e., left column). Perspectives of participants are crucially important and, of course, overlapping as Jackson's e-mail quoted above makes clear. For more information on the methods in each cell in table 1 and for "critical systems thinking," see Jackson's 2003 book, *Systems Thinking: Creative Holism for Managers*.

In sum, this introduction identifies a few paradigm shifts. First, there is a shift in single agency to multiple agency, from linear thinking to systems thinking. Second, there is a distinction between hard systems and soft systems. Third, there is a shift in primary cause or agency. Whether cause relates to gravity in the example of astronomy, or human agency in the examples of education and management, both examples have scientific merit. Both are a result of extensive empirical observation, rather than speculation. In fact, the purpose of this paper is to specify a systems paradigm that unifies the old and new paradigms for education and management, and to demonstrate its theoretical and practical merit. Following Jackson's comment, this paper aims to get underneath the great variety in participant perspectives for some simple robust explanatory principles. It also suggests a corresponding practice.

BOULDING'S TYPOLOGY OF SYSTEM COMPLEXITY

Twenty centuries after Plutarch lived, Kenneth Boulding provided a typology of system complexity (1956), which is a powerful scaffold to advance the paradigm shift in the soft sciences of management and education. His breakthrough for me was the distinction between Level 3 and Level 4 systems—from systems that self-regulate to *exteriorly prescribed criteria* to systems that self-regulate to *interiorly prescribed criteria*.

Boulding's Nine System Levels

Boulding looked to the real world and nature to uncover the hard facts of soft social systems. He identifies nine levels or types of systems in the world. From simple to complex, they are:

1. *Frameworks:* Systems composed of static structures, such as the arrangements of atoms in a crystal or the anatomy of an animal.
2. *Clockworks:* Simple dynamic systems with predetermined motions, such as the clock and the solar system.
3. *Control systems:* Cybernetic systems capable of self-regulation in terms of some exteriorly prescribed target or criterion, such as a thermostat.
4. *Open systems:* Systems capable of self-maintenance based on a throughput of resources from its environment, such as a living cell. The behavior of living systems is determined by interiorly prescribed criteria.
5. *Blue-Printed growth systems:* Systems that demonstrate divisions of labor, that reproduce not by duplication but by the production of seeds or eggs containing

preprogrammed instructions for development, such as the acorn-oak system or the egg-chicken system.

6. *Internal-Image systems:* Systems capable of a detailed awareness of the environment through sense organs (eyes, ears, etc.). Information is received and organized into an image or knowledge structure of the environment as a whole, a level at which animals function.

7. *Symbol-Processing systems:* Systems that use language and other symbols, are self-conscious, and can contemplate the past, present, and future. Humans function at this level.

8. *Social systems:* Multicephalous (many-headed) systems comprising actors functioning at level 7 who share a common social order and culture. Social organizations operate at this level.

9. *Transcendent(al) systems:* Systems composed of the "absolutes and the inescapable unknowables." This would include religion and philosophies. I will use this category also for *transcendent* systems or when the emergent, resulting system (also the whole) is greater than the sum of its parts. (Adapted from Boulding, 1956.)

Boulding's Typology Linked to Organization Theory and the Social Sciences

Boulding's typology is clarifying to social science/organization theory. Illustrated in figure 5, Boulding notes that "most of the theoretical schemes of the social sciences are still at Level 2 [clockworks], just now rising to Level 3 [thermostat-like systems], although the subject matter clearly involves Level 8 [social systems]" (Scott, 1986, p. 78).
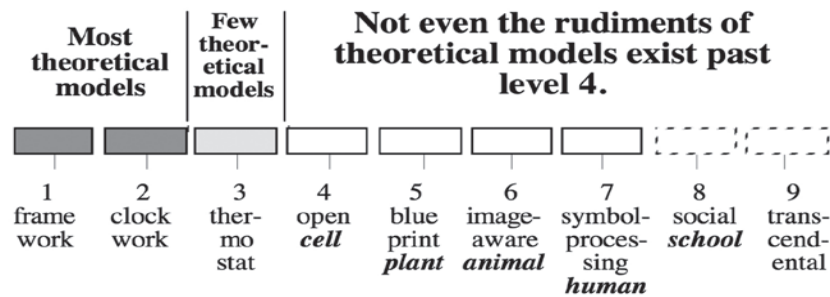
Figure 5. Boulding's Nine Systems Levels Linked to Organization Theory

Boulding's typology also explains the conflicting "either-or" perspectives of organization theory and of the two main camps—old-paradigm directive versus new-paradigm participatory. It also clarifies the ways in which old-paradigm directive or bureaucratic assumptions are *both* inadequate *and* suitable.

The inadequacy of clockwork assumptions of old-paradigm models. The fundamental flaw of current old-paradigm directive or bureaucratic models lies in the assumption of predictability and stability or "clockwork" assumptions (e.g., the principal controls the teachers and the teacher controls the students). There is no (or too little) distinction between processes that Boulding calls clockwork (predictable) and nonclockwork

(variable, intangible). Our current educational reform efforts are based on, or maintain traces of, these unexamined assumptions. For example, in the new-paradigm term *cooperative learning*, *cooperative* means operating jointly, but my experience of the meaning of *cooperative* in K–12 schools as a young student and as a teacher is closer to *obedient* (an old-paradigm virtue). As a child, I got grades in "cooperation," which my parents and I interpreted as obedience. As a discouraged teacher and department chair, I felt disobedient when I spoke up when I was asked to do something that was harmful to my students or fellow teachers—that is, until I was elected as mentor teacher.

The suitability of clockwork assumptions. While the clockwork assumptions underlying bureaucratic systems are known to be inadequate, Boulding remarks that "much valuable information and insights can be obtained by applying low-level systems [frameworks, clockworks] to high-level subject matter [humans, social, and transcendental systems]" (Scott, 1986, p. 78). The reason for this is that each of Boulding's nine system types incorporates all those below it. Figure 6 illustrates this principle and hard fact. For example, a social system (level 8 system type) is made up of systems and subsystems of levels 7 through 1. A human being (level 7 system type) is made up of systems and subsystems of levels 6 through 1.
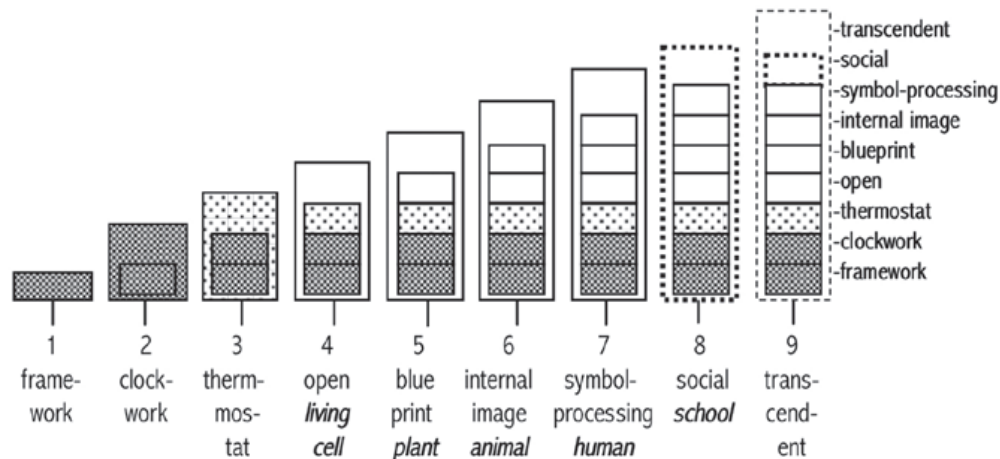
Figure 6. A View of Boulding's Nine Systems and Their Subsystems

Thus, proponents of decentralization and self-regulation who ignore the need for framework and clockwork subsystems are also shortsighted. The fully specified new paradigm must subsume and include characteristics of the old; it must be joint optimizing for both stability and flexibility. More specifically, Boulding's model distinguishes between subsystems of external and internal agency to explain what can be predicted or externally designed and controlled, and what is controlled by internal agency or criteria (e.g., individual human choices).

Boulding's explanation of the inadequacies and suitabilities of the top-down governing model is clarifying and unifying. His typology resolves the either-or conflict of many

modern organizational change theorists and practitioners. It provides the new unifying question, and then answers it. In other words, the old/new paradigm dilemma "Which is right, *top-down directive* or *bottom-up participatory* policy?" (cf. *directive*: controlling the supervised who are empty vessels to fill; or *participatory*: flexibility for the supervised who are fires to be kindled and active participants). The answer is "both." The new question clarified by Boulding's Typology is: "Which *parts* of a social system need to be controlled, and which *parts* left flexible?"

Coding in Figures

Figures 5 and 6 also briefly introduce my coding to illustrate the natural breaks and the increasing unpredictability of Boulding's system levels. Levels 1 and 2 are dark gray boxes because structures and clockworks are stable, predictable and/or designable. Level 3 is a light gray box, as control systems (cybernetic, thermostat-like systems) are self-regulating to *externally prescribed or designable criteria*. Levels 4 through 7 are clear boxes, as living systems are not designable by an outside designer. Levels 4 through 7 are *self-regulating to internally prescribed criteria*. Levels 4-7 systems also have *clear, mandatory boundaries* (shown by solid line-boundaries). Levels 8 and 9 are clear boxes with dotted-line boundaries, as social systems are *unbounded and intangible*.

To illustrate both Boulding's nine system types and the nature and increasing complexity of the nine types, I look at figure 5 as a top view of Boulding's nine system types. Figure 6 is a front view and shows the nine systems types (from simplest to most complex along the bottom of fig. 6) and all the subsystems contained in each system type (at the right of fig. 6).

Figure 6 provided great clarity and significance. As a twenty-plus-year classroom teacher turned detective trying to figure out why school reforms are so unsuccessful, even harmful, I had found an *amazingly satisfying answer*. Boulding's nine-level social system clarified that only the frameworks, clockworks, and control systems of a complex social system can be controlled by an outside agent --a teacher, principal, or educational policy maker. Thus, only the frameworks, clockworks, and control systems of a reform effort, program, or mandate can be controlled. Boulding's social system was satisfying to my intuition and experience, to my right brain and procedural knowledge. Now I just needed to understand this satisfying answer and transform it with my left brain into declarative knowledge.

Boulding's Social System, the Bureaucratic Model, and the Participatory Model

I first wanted to look at the bureaucratic model, the laissez-faire/participatory model, and my understanding of Boulding's social system side by side. Figure 7 is an attempt to do this in three illustrations. Bureaucratic models (fig. 7A) assume that everything is or should be clockwork; they are too rigid and assume full external agency. Laissez-faire models (fig. 7B) assume organization processes are nonclockwork, that everything is or should be flexible; they are too chaotic and assume too little or no external agency.

The model that is clarified with Boulding's typology is joint optimizing (fig. 7C). Levels 1 through 3 are *predictable* and designable to external criteria; they need to be *stable* (frameworks; clockworks) or *adjustable* (i.e., thermostat settings, goals, or "ideals"). Levels 4 through 7 have some predictability but are almost infinitely *variable*. They depend on an internally prescribed criterion in the individual participant. In human social systems such as schools, those parts depend on human perception and learning and need to be flexible. Levels 8 and 9 are *intangible*. The boundaries of level 7 systems (human) are fixed. The boundaries of level 8 systems (social systems) are variable, permeable, or intangible.


A.	B.	C.
Bureaucratic	Laissez-faire	Boulding's model
(too rigid)	(too chaotic)	(joint-optimizing)
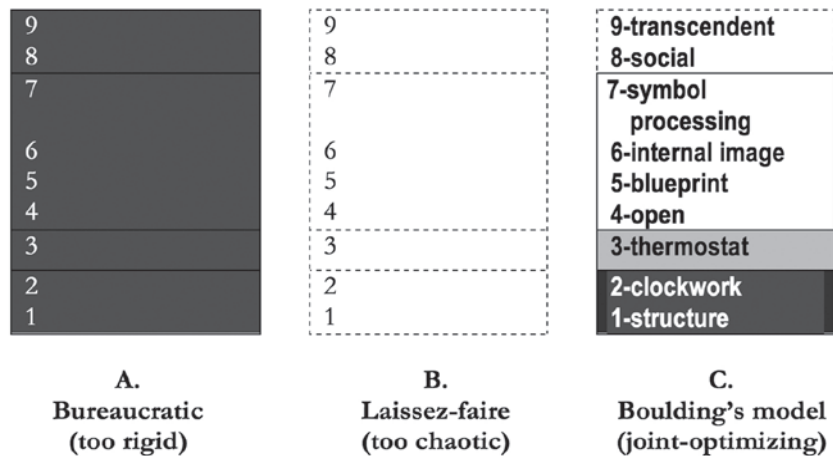
Figure 7.   Assumptions of Three Models of Social Systems

Healthy and Unhealthy Schools

Next, I wanted to understand what the figure 7 illustrations (bureaucratic, laissez-faire, and Boulding's social system) revealed to me about teacher overload and overwhelm. Figure 8 illustrates my assumptions of four types of organizations regarding how their people use their energy in schools.

Figure 8A illustrates organizations designed with the assumptions of the Boulding nine-level model—namely, the organization's structures, clockworks (dark gray), and thermostat-like parts (light gray) are designed and arranged around the needs and goals of the people and organization (clear). When organizations are designed around these assumptions, people use minimal energy (E) for stability, adjustability, and flexibility, so they can use their energy for organization goals and transcendence. Organizations not designed with the assumptions clarified by Boulding are less effective. In figure 8B, the clockwork assumptions of the bureaucratic model force people to use their energy (E) to gain nonclockwork flexibility. In figure 8C, the nonclockwork assumptions of the laissez-faire and participatory model force people to use their energy (E) to gain stability. In figure 8D, organizations that attempt to design for both control and flexibility but without rationale force people to use their energy (E) to make up for or gain flexibility or stability in the poorly conceived new models.
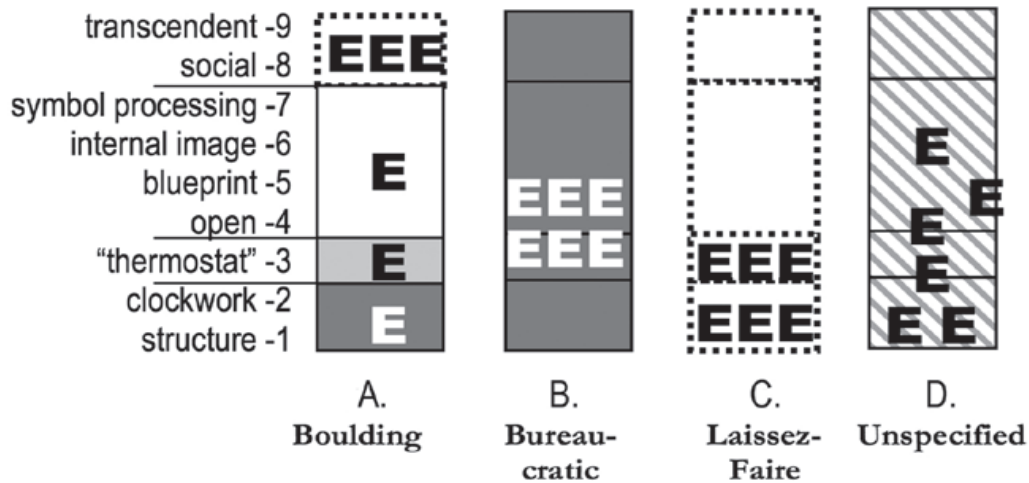
Figure 8. Use of People's Energy in Four Types of Social Systems

School Level Outcomes

Given people's use of energy in Figure 8, I then reflected on the declining outcomes in earlier figure 1. Linking declining outcomes to Boulding's concepts, Figure 9 illustrates very healthy or transcending schools, average schools, and unhealthy or declining schools.

Transcending
Figure 9 left indicates transcending. People in the organization or school are getting their needs and goals met so easily that there is considerable evidence of social and transcendental function. The organization is carefully designed so that all of its members can meet their needs and goals at their own rates. People meet their own goals and transcend them to new goals.

Average
Figure 9 center indicates average. Some people in the organization or school are getting some of their needs and goals met. There is some evidence of social function.

Declining
Figure 9 right indicates declining. Most people in the organization or school are not getting their individual needs and goals met, so there is little evidence of social function. People at the bottom of the hierarchy are in the survival mode (living from paycheck to paycheck). People at the top of the hierarchy are working toward level 7 personal goals (wealth, promotions), rather than level 8 organization goals.
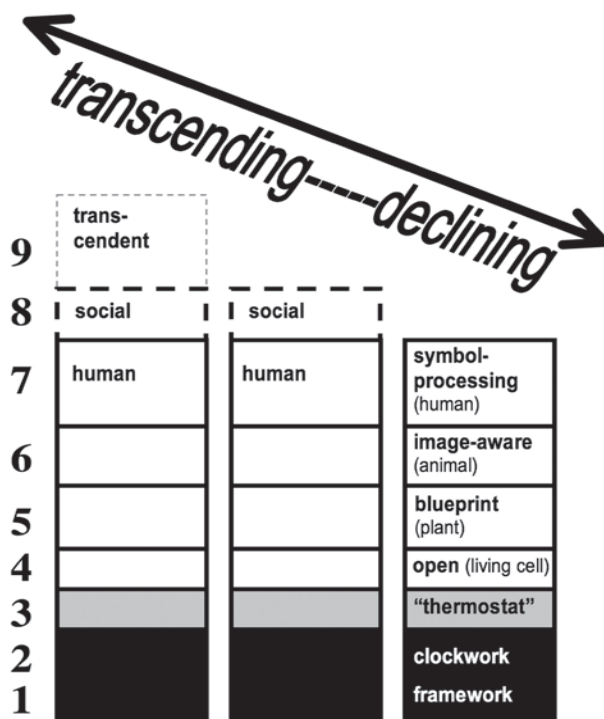
Figure 9. Close-Up on Outcomes

More accurately, instead of three types, this way of looking at schools or social systems might yield a continuum, with schools ranging from transcending to declining (two-headed arrow in fig. 9). Moreover, outcomes in social systems are very complex and multifaceted. Some people (students, teachers, parents, or others) may be very satisfied and transcending, and others may be at the survival level. People's satisfaction also may vary from year to year, day to day, hour to hour.

Even given this complexity, these three types of outcomes inspired by Boulding are a useful and illuminating way to look at school outcomes. My experience of school social decline is not unique. For a long time now, modern urban schools have been reported as functioning at the survival level in the descriptive educational literature, with increasing participant isolation and disconnection (Erickson, 1989; Maeroff, 1988), urban school staff struggling for survival (Rogers, 1989), and increasing school-site violence (Walker, 1995).

TPO THEORY

Condensing Boulding's nine levels to three results in TPO Theory and *Things, People*, and *Outcomes as* the three key parts of a social system (Gabriele, 2008, 2014). The three parts each have very different properties and they each behave according to different laws and principles. Understanding the characteristics and behavior of each of these key parts,

and designing around this understanding, is the value and new contribution of the TPO model.

Things (Boulding's Levels 1—3)

Levels 1 through 3 of the nine-level social system are things. Things of a school can be predicted, designed, and regulated to exteriorly prescribed criteria and goals; in other words, the cause or agent is an architect, builder, publisher, superintendent, principal, teacher, and others. In the TPO model, according to Boulding's system types, three kinds of things are:

(1) *Frameworks or static structures*, such as buildings, rooms, chalkboards, bookshelves, wall charts, equipment, TVs, computers, books, supplies, paper, pencils, pens, and so forth.

(2) *Clockwork procedures and systems* are composed of frameworks plus clockworks (calendars, schedules, classroom and school opening and closing routines and procedures—hourly, daily, weekly, monthly, yearly, and holiday or other special times). The school decision makers design the specific clockwork systems of the school. For example, the school year runs clockwork from September through June. School is in session by clockwork, from 8:00 to 3:00. Faculty meetings are every Tuesday from 3:00 to 4:00. Period one is from 8:00 to 8:55 every day. Teachers might set up clockwork systems in their classes. For example, in period one, students might have a review activity from 8:00 to 8:10. The teacher introduces a new lesson from 8:10 to 8:30. Students work on activities coming out of the lesson in small groups or teams from 8:30 to 8:55. Tests are Friday.

These systems or procedures are designed to turn *on* or *off* by clockwork. For example, the school year is in session, *on*, September though June. School is *off* July and August. School is *on* from 8:00 to 3:00. School is *off* after 3:00 p.m.

(3) *Control systems or thermostat-like procedures, processes, or systems* are composed of frameworks, clockworks, and thermostat-like (cybernetic) systems. Control systems are self-regulating to exteriorly prescribed criteria and goals, that is, educator-determined goals.

First, looking at the building, there are proportions and ratios to consider; the size of the heater should be determined by the size of the building. Ducts and vents should be the right size and placement in the walls of rooms where heat is desired. (Perhaps there is no need for heat in the garage or storage rooms.)

Second, zooming in to the thermostat, there are parts that are designable and controllable.

- ❖ *The settings (frameworks—level 1).* The system's goal or settings are set by an outside agent. In figure 10, the teacher has set the desired room temperature at sixty-eight degrees.
- ❖ *The system modes.* The teacher can choose among various system modes, the gray circles along the bottom of the thermostat in figure 10.
  - ➢ *Off:* The system is *off* and does not respond to the sixty-eight degrees set by the teacher.
  - ➢ *On:* Manual*:* The system is *on* but is not set to respond to the goal set by the teacher. The room gets hotter and hotter if the windows and doors are closed.
  - ➢
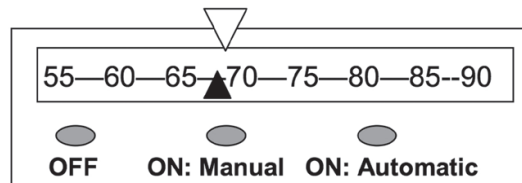
Figure 10. A Thermostat and Its Settings

Third, there are the parts that are self-regulating to exteriorly prescribed criteria—that is, the goal set by the teacher.

- ❖ *On: Automatic.* The system self-regulates to outside information, the selected goal. In the illustration, the larger triangle on top is a goal set by the teacher or manager: sixty-eight degrees. The smaller triangle is reflecting that the temperature of the room is about sixty-seven degrees. The heater has turned itself off and will stay off until the temperature goes below the range (perhaps 64°). When the heater turns on again, it will stay on until the room temperature measures seventy-two degrees, and then it will turn off again. If the windows, doors, or roof are open or broken, heat will be lost. The heater will not turn off, and the monthly bill will be very high!
- ❖ *The Sensor.* The black triangle in figure 10 represents the sensor. The teacher has no control of this. It was designed by the engineer to sense (in this case) room temperature.

Things, and the three kinds of things—frameworks or static structures, clockworks, and thermostat-like processes or systems—are the domain of traditional science, where cause and effect has high predictability. The three types of things are pictured below in figure 11A as the first of the three key parts of a social system.
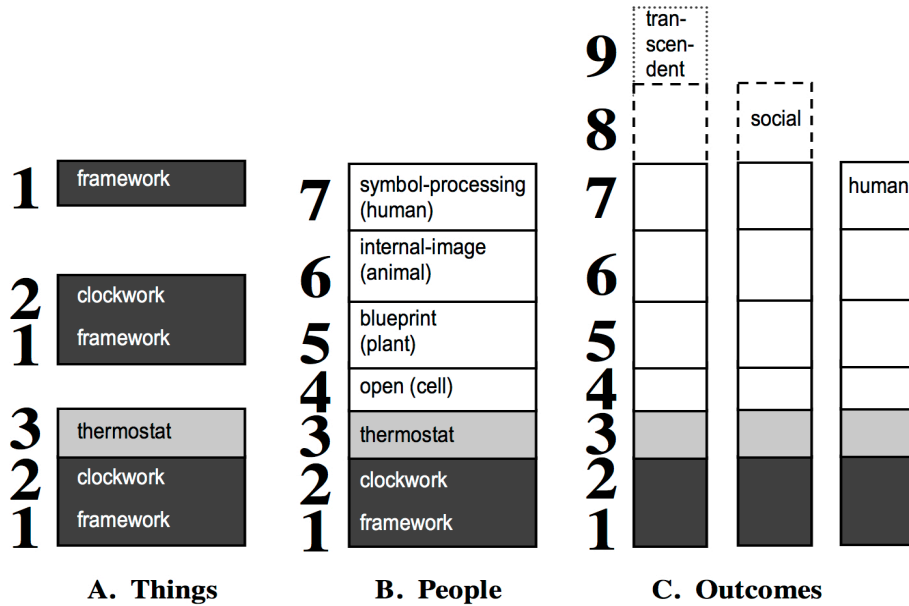
People (Boulding's Level 7)

People in a school are not designable by an outside agent (teacher, principal, etc.). People, and other living things, are not scientifically predictable. In contrast to things that are inanimate, living things are goal-seeking. As Boulding puts it, they are self-regulating to interiorly prescribed criteria and goals (level 4). Unlike the thermostat, which has a sensor designed by an engineer, living things have sensors that are internal, biological. The behavior of human beings is generally predictable as acting to meet their own

individual goals and needs: for survival, safety, belonging, achievement, self-actualization, and transcendence (Maslow in Valle & Halling, 1989). Predictability decreases from levels 4 through 7, or as complexity increases. Predictability decreases in humans because of individual differences: genetic diversity and how individuals have developed their interests, training, and skills (level 5: blueprint); people's immediate here-and-now perceptions through the five senses from among competing stimuli (level 6); and their long-term perceptions, reflections, and choices (level 7—contemplating the past, present, and future and their individual skills). Thus, the variety in people's behavior is almost limitless.

Figure 11. TPO Illustrated with Boulding's Levels' Outcomes

Of course, people also are composed of frameworks, clockworks, and thermostat levels. Because of their levels 1 through 3 systems (e.g., their bodies, organs, circulatory and respiratory systems), their behavior is generally predictable; they will act to meet their own self-perceived needs and goals. The thermostat (level 3) is a key function in higher-level systems. For example, relating only to Maslow's hierarchy of needs (Valle & Halling, 1989, p. 294), people have six thermostats that are self-regulating: for survival, safety, relationship, achievement, self-actualization, and transcendence. When the more basic needs are not being met (survival, safety, relationship), people have to use their energy to meet them, and they have little energy for higher goals (achievement, self-actualization, and transcendence). Another excellent example of the thermostat level 3 function in humans is input overload—and teacher burnout—which explains why 18 + 1 = 17 in busy social systems. People in social systems are illustrated in figure 11B.

Outcomes (Boulding's Levels 8--9)

Outcomes are the third key part of a social system. Three types of outcomes for social systems illustrated in figure 11C. They are: transcending, average, or declining

(discussed and illustrated earlier in fig. 9). These three types are oversimplified, but they provide new insights into social system behavior, desired and undesired outcomes, and what should count as evidence.

The TPO Model for Everyone

In a nutshell, and pictured below in figure 12, TPO theory identifies things, people, and outcomes as the three key parts of schools due to their different behavioral laws. The behavior of things (T) is designable, predictable, and controllable (illustrated by straight solid lines). The behavior of people is not controllable. Individual behavior is variable. We can generally predict that people will behave according to their own goals, perceptions, and abilities (illustrated by a face on the inside, and arrows pointing out). Outcomes are variable and depend on people's behavior. Specific outcomes are uncontrollable, unpredictable, and fleeting (illustrated by dashed-line boundaries). However, outcomes are generally predictable. That is, if social systems are designed to satisfy their members, outcomes will be positive, and the social system will flourish. On the other hand, if social systems are designed in ways that ignore the needs of their members, outcomes will be negative, and the social system will deteriorate (illustrated in fig. 12). I propose this illustration as suitable for everyone interested in schools.
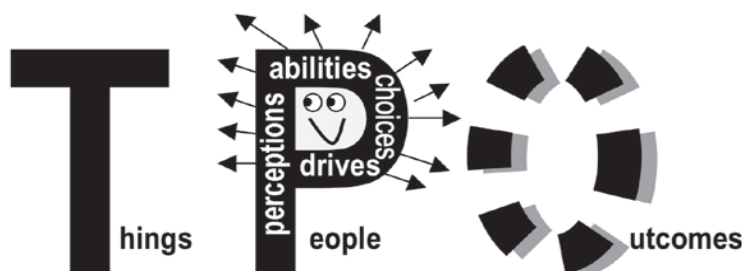

Figure 12. The TPO Model for Everyone

The TPO Model for Specialists and Theorists

With regard to education theory, I thought it was interesting and significant that McREL (Mid-continent Regional Educational Laboratory), a well-respected nonprofit educational organization, categorizes the three major facets of schools in a similar way (McREL, 2000). Their three parts are the *technical*, *personal*, and *organizational* domains, an organizer chosen from work by educational scholars Cordell and Waters (1993), who propose a three-step process of systems thinking. The Cordell and Waters three-domain names begin with TPO, and their domains—*technical*, *personal*, and *organizational*—are similar to things, people, and outcomes. Their technical, personal, and organizational domains differ in that they focus on the designable components of these three domains (which is very useful); whereas the TPO theory terms here—things, people, and outcomes—focus on the different behavioral laws and principles of the three domains (which, until this book, have not received adequate attention, considering their importance).

A Social Science Paradigm Shift: Boulding, TPO Theory, and the RoundTable

With regard to organizational change theory, TPO (technical goals, personal goals, and organization goals) reminded me of socio-technical theory. But it adds a new valuable distinction. The "socio" in socio-technical theory is now clarified by TPO to consist of two parts: personal and organizational goals. This is an important distinction because personal and organizational goals have very different appeals (which is the heart of this book).

In other words, socio-technical theory recognizes the interaction between people and technology in workplaces. TPO divides the "socio" into two components: personal goals and organizational goals. Thus, the two dimensions of socio-technical systems are divided into three dimension: technical =: (1) things/technology; and social = (2) personal needs, goals, and outcomes, and (3) organizational needs, goals, and outcomes.

TPO Theory in a Nutshell

TPO theory explains current decline in schools in this way: when *things* (T) are selected and arranged without consideration of *people's* (P) self-perceived needs, wants, perceptions, abilities, and roles, *outcomes* (O) in learning, performance, and behavior will be increasingly negative.

On the other hand, when *things* (T) are selected and distributed to allow *people* (P) to meet their own self-perceived needs and goals, according to their own interests, abilities, and roles, each at his or her own pace, *outcomes* (O) will be increasingly positive.

Close Up on People (P)

TPO Theory assumes that primary agency is within each individual person. In classrooms, primary agency for learning is within each student. In workplaces, primary agency for learning is within each employee. This requires a closer look at the pathways from T (lessons and agenda), through P (students and staff) to O (outputs, behavior and performance).

Pathways and Entry for Pickup and Learning
Interior agency established, I illustrate TPO Theory in figure 13 left with graspers on the P to show information entering by intake or pickup, rather than input. Figure 14 shows the location of three main graspers pointing to things (lessons, assignments, information) as (1) sight, (2) hearing, and (3) touch. It shows one main grasper pointing to outcomes (O), to illustrate that pickup and learning also occur from reflecting on one's mistakes and successes. There are also tiny gray graspers all over the body, representing the ability of the whole body to pick up information through touch. Pickup occurs during formal instruction (e.g., students listening, reading, watching, writing, drawing, handling clay in the classroom, and running and practicing sports on the school field). Pickup occurs also outside of formal instruction, when learners experience another's smile or frown, a compliment or disapproving comment, or a handshake, a friendly pat or hug, or a slap or hit. People can reflect on and contemplate what they have picked up or learned, or they can deny, ignore, or discount it. Therefore, the graspers in figure 13 are *possible* entry

points, not *automatic* entry points.

Figure 13.   Entry and Exit Points for Pickup and Outputs

Main Exit Points for Outputs, Behavior, and Performance
Right in figure 13, TPO Theory is illustrated with arrows on the P to show outputs, behavior, or performance. They show two main exit points: *the mouth (speaking)* and *the hand (writing)*. This tells us that *outputs* are mainly spoken and written. Outputs can also be acted out or performed (illustrated by a third, smaller arrow pointing right at the feet). Of course, if *outputs* are spoken, written, *and* performed, there is a greater chance of robust learning. A third large arrow is pointing to things because people also design, select, and rearrange the things they use in their social systems.

Everyone as Learners

Figure 14 illustrates that all people are learners, whatever their role. The large P at the left stands for teachers (or supervisors). Supervisors are level 7 systems, with individual traits, needs, and goals that influence pickup and output (gray graspers and arrows). However, they have an assigned role in the organization—hence, the black arrows (or level 8 goals) point to the things that are arranged for the supervised. The smaller P stands for students (or supervised). They, too, have personal goals (pictured as gray arrows and graspers) and organization goals (which would be black if they were pictured).
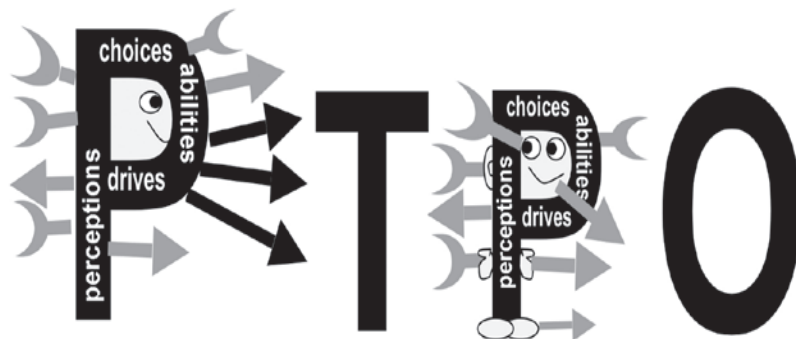
Figure 14. People as Supervisors (e.g., Teachers) and Supervised (e.g., Students)

Close Up on Things (T)

Experienced, effective leaders come to understand how learning works in those they supervise, even if they are not aware of the theory behind their understanding. Figure 15 left illustrates situations where the leaders' assignments, tasks, and requirements (T) have little or no understanding or regard for how learning and mastery occur in those they supervise (P). Their input is illustrated in arrows with sharp points. Figure 15 right illustrates situations where assignments, tasks, and requirements are designed and distributed with regard for the people they supervise. Their input is illustrated in rounded arrows. Figure 16 also shows the resulting outputs (weak thin arrows versus thick arrows).
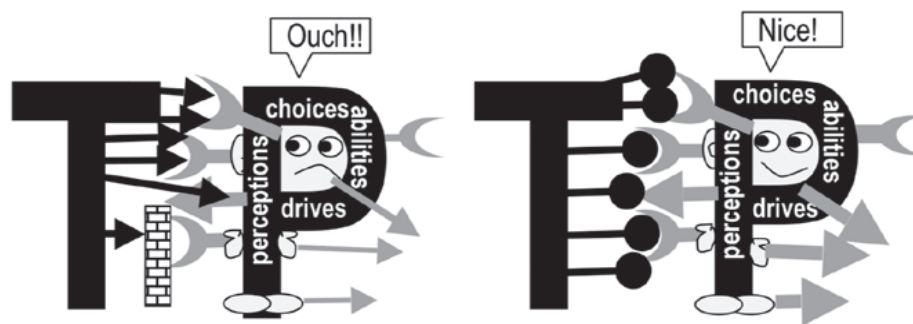
Figure 15. Poor and Effective Lessons (T): Entry and Exit Points for Pickup and Outputs

Interiorly Prescribed Criteria in Human Agency

An understanding of interiorly prescribed criteria in human agency is crucial in this paradigm shift--from old to new to a systems paradigm, which encompasses both old and new. The traits in people illustrated in figure 13 through 15 are inspired by Boulding's typology. His typology made a huge step in turning old theory on its head. Elaborating Boulding, Gabriele (1997) identified social system agency in individual's interiorly prescribed criteria. TPO Theory clarifies that people learn depending on their drives (level 4), their abilities (level 5), their perceptions (level 6), and their choices (level 7).
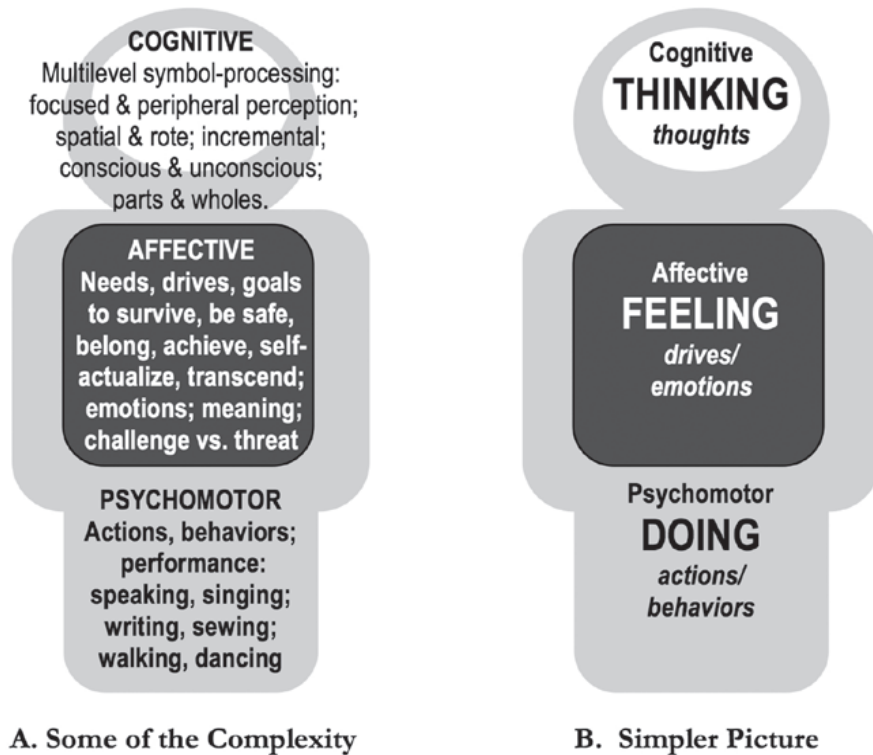
Three domains of learning: cognitive, affective, and psychomotor (CAP)

Bott's three domains of learning, *cognitive, affective*, and *psychomotor* (1995), are useful organizers to refine TPO Theory. The cognitive domain relates to Boulding's term *symbol-processing* (level 7). The affective domain encompasses the goal-seeking behavior of living things—their feelings, needs, desires, and drives (originating at Boulding's level 4). The psychomotor domain refers to behavior—voluntary muscle activity, both gross and fine motor skills (originating perhaps at Boulding's level 6). Furthermore, Bott's terms parallel Patterson's principles. Patterson and Covey (2002) and Patterson and associates (2005) offer a simple formula that explains that people in the

workplace will do what their supervisors ask them to do under two conditions: 1) if they want to, the *affective* domain, and 2) if they are able to. Whether workers are able has two dimensions: *cognitive*--if they know how to do what is asked, and *psychomotor*--if they are physically able to do it.

Figure 16A illustrates some of the complexity of the three domains. However, it is still overly simplified, for example, it doesn't even try to illustrate their interactivity—that the cognitive, affective and psychomotor domains work together, or that the affective domain is the primary domain. Figure 16B provides a very simple, more manageable summary.

COGNITIVE
Multilevel symbol-processing:
focused & peripheral perception;
spatial & rote; incremental;
conscious & unconscious;
parts & wholes.

AFFECTIVE
Needs, drives, goals
to survive, be safe,
belong, achieve, self-
actualize, transcend;
emotions; meaning;
challenge vs. threat

PSYCHOMOTOR
Actions, behaviors;
performance:
speaking, singing;
writing, sewing;
walking, dancing

Cognitive
THINKING
thoughts

Affective
FEELING
*drives/
emotions*

Psychomotor
DOING
*actions/
behaviors*

A. Some of the Complexity   B. Simpler Picture

Figure 16. Three Learning Domains (CAP) and Their Primary Sites in the Human Body

Condensing Three Principles to One: Adjustment Capacities

TPO Theory condenses Boulding's nine system types into three, clarifying that "*THINGS* need to be controlled and *PEOPLE* need flexibility for best *OUTCOMES*." This results in an improved understanding of the behavior of the things, people, and outcomes--also the technical, personal and organizational domains of a social system. Good indicators for effective social systems become *adjustment capacities*, hence a thermostat metaphor. This is a final condensing of three principles to one: adjustability or responsivity. The TPO Thermostat metaphor has resulted in a TPO Thermostat Guide—a tool for leaders to view and manage three modes of their organizations: 1) OFF (planning); 2) ON-Manual (agenda/resource delivery), and 3) ON-Auto *(*maintaining the optimal work environment--metaphorically around 68 degrees—for participant self-regulation).

THE ROUNDTABLE AND THE TRIPLE ACTION ROUNDTABLE

The "RoundTable" is a user-friendly practice inspired by Boulding's Typology of System Complexity and research in education and systems methods. Designed to develop user-selected lessons/agenda while accelerating learning and building healthy community, the RoundTable is a tool suitable for classroom- or meeting-facilitators in schools, workplaces, or other organizations. It is proposed as a regular supplemental activity—perhaps weekly in classrooms, monthly in workplace meetings, and daily in weeklong programs, such as annual conferences or summer staff development programs. In busy schools and workplaces, the co-operated RoundTable is a 5/25 RoundTable--that is, five minutes for agenda delivery, and 25 minutes for participant reports—time distributed equally among all present. Over the years, we have observed that: "Just as we break the sound barrier when we travel faster than the speed of sound, we break the communication barrier when we hear thirty authentic viewpoints in thirty minutes." Cued by a one-page leader's guide/script, the facilitator role rotates among all RoundTable participants.

Here's what the RoundTable looks like in a fourth grade classroom.

> On the teacher's cue, today's leader reads the Leader's Guide, which opens the RoundTable session and cues the readers. On cue, readers read aloud the RoundTable Guidelines, which are five short, one-paragraph texts, such as:
>
> - *Our Time:* In the thirty-minute RoundTable, we have five minutes to read. We have twenty-five minutes to listen to everyone's ideas.
> - *Our Purposes:* We listen in a whole group together. We hear thirty different ideas in twenty-five minutes.
> - *How We Answer:* The leader will say "thank you" after each person speaks. We will save all other answers to each other until after the RoundTable.
> - *How We Listen:* As we listen to the readings, we quiet our minds and think about the topic and our inner thoughts. As we listen to everyone's ideas, we respect and enjoy all the different viewpoints.
> - *How We Speak:* We each have one turn. We want to hear you say something about the story or topic, or anything else that is on your mind. Or you may pass if you choose.
>
> These same texts are the *basic readings,* read at every session (for five or more sessions) to remind students of the "rules" of the RoundTable. The student leader then asks the teacher for the topic, which typically comes from a current lesson, activity, or field trip related to social studies, science, or language arts.
>
> The leader then asks those students who are ready to speak to raise their hands, and chooses to start where at least three students in a row are ready. The turn goes around the circle or around the room. For the next twenty-five minutes, each student has an option to comment, with the others silently listening. Comments

are generally personal experience or interest, relating to the topic of the day. Comments, however, are not strictly limited to the topic, and students sometimes use their time to report on what they are thinking about in the moment. Sometimes they say, "Pass," in which case the turn passes to the next student. Boys and girls sit next to each other, all listening intently, some looking at the speaker, others looking down or at the RoundTable Guide. Students occasionally wiggle in their seats, play with a pencil or other item, or rustle a paper while they are listening. Sometimes they giggle or laugh with the speaker's words, or they nod in agreement. They help each other in the leadership roles. For example, if the leader forgets to call on a student, students nearby call it to the leader's attention. When all students have been given an opportunity to speak, the leader reads the closing reading—which includes thanking the class for their participation—and turns the class back over to the teacher.

In later weeks or months, the *basic readings* are condensed or deleted, and new basic readings are added--rich in new subject matter. Basic Readings are carefully designed by word count to be limited in time, say to five minutes. This insures the 25 minutes will remain for participant comments. Given the forty week school year, all students are offered a turn to be RoundTable leader.

The RoundTable was introduced in 1997 and has been followed in three communities: several fourth-grade classrooms for 14 years; the annual conference of the ISSS for 14 years; and in Los Angeles chapters of the American Society for Training and Development (ASTD LA) and the International Society of Performance Improvement (ISPI-LA) for two years. Thus, the transferability and adaptability of the RoundTable is promising.

The RoundTable intervention/Innovation for Systemic School Renewal

The RoundTable demonstrates three criteria proposed to be necessary and sufficient conditions for a successful systemic school innovation. Namely, it is *inclusive, continuing,* and *emancipatory* (ICE).
* *Inclusive:* serves the whole learner (academic, cognitive, affective domains), the whole class (each and every student), and the whole organization (i.e., students, staff, parents) in one of their existing groups (e.g., classrooms, staff meetings, PTA meetings)
* *Continuing:* a thirty-minute daily, weekly, or monthly session fits right into existing classrooms and meetings
* *Emancipatory:* dramatically boosts learning and community spirit

The rICE Illustration

An illustration of a more general ICE premise is presented in figure 17. My aim in drafting this illustration is to foster thought about how the ICE premise might apply to many types of intervention or program in many types of social system. The three dimensions and axes of figure 17 are labeled: from the left, *Inclusive* (axis Z), *Continuing* (axis X), and *Emancipatory* (axis Y). Note that the three conditions ICE in the specific

example of the RoundTable become rICE in the general premise (toward a general theory), adding an r (relativity) factor. *Relativity* is defined as depending on other factors that vary according to context.

r = *Relative:* Specific criteria and measures of ICE—the inclusive, continuing, and emancipatory conditions—are relative, depending on the factors (i.e., Things: frameworks, clockworks, and control systems) characteristic of each specific system level and/or system type.

I= *Inclusive:* Designed to serve (1) the whole person (the face in fig. 17); (2) the whole group—each person in the room, class, or meeting; (3) the whole building or school; (4) the whole school district or organization, in (5) the whole city, state, or country, and (6) the whole world. Axis Z is a first dimension and a space view (also Boulding's system level 1, a designable Thing). The measure of Inclusivity has two dimensions. First, T = In what ways and to what degree is design of the input inclusive? Designed for everyone in the system? Second, O = (a) To what degree and in what ways do the outcomes match, surpass, fall short of, or differ from the inclusivity traits in the design? (b) Has everyone in each group, and all groups in the system, been included at the end of the study?
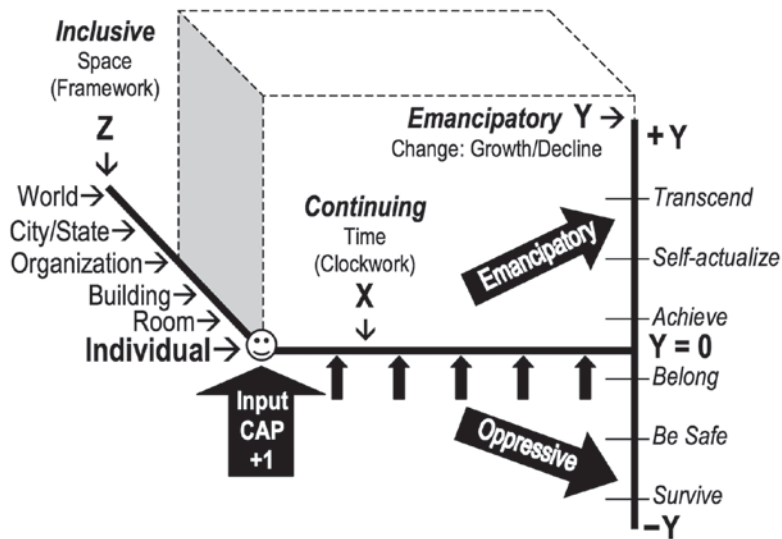
Figure 17. rICE: Mapping the Three Optimal Conditions for a Successful Systemic Innovation

C= *Continuing:* Regularly revisited (e.g., in auditory review routines), daily, weekly, or monthly (small black arrows pointing up to the X-axis in fig. 17); and always accessible (e.g., wall charts or at the fingertips of users). Axis X is a second dimension and a time view (also Boulding's system level 2, a designable Thing). Like Inclusivity, the measure of Continuity has two dimensions. First, T = Does the design of the input build in the continuity traits? Is the input designed to be reviewed weekly? monthly? Second, O = Is the outcome continuous? To what degree and in what ways do the outcomes match, surpass, fall short of, or differ from the continuity dimension in the design? At the end of the study, did the users actually have review routines weekly? monthly?

E = *Emancipatory:* Unshackling and accelerating positive development. Axis Y is a third dimension and an outcome view (also Boulding's system levels 7-9 functioning). Figure 17 illustrates this condition, and its opposite, in two arrows labeled *emancipatory* and *oppressive*. On the right of the figure is Maslow's hierarchy as a loose guide. In other words, if system members are able to use their energy to achieve, self-actualize, and/or transcend, this suggests the emancipatory condition. If system members have to use their energy to belong, feel safe, or survive, this suggests the oppressive condition. The condition of emancipatory is not designable; it is emergent. However, aspects of the emancipatory condition are designable because program quality or input (large black arrow pointing up in fig. 17) is designable.

The Triple Action RoundTable

Evolving the RoundTable further, the Triple Action RoundTable (a three-pronged approach) involves three simultaneous leverage points, or entry points in the social system. It is thus proposed to be at least three times more powerful in its ability to enhance or transform schools and workplaces. Still key to the approach is the assumption that agency is within each individual group member. Thus, taking a spatial view of a social system, and with regard to entry points, the three prongs are seen as 1) bottom-up; 2) top-down; and 3) out-in-out.

The first prong is the RoundTable itself, a bottom-up approach. It develops mastery among participants and front line workers of a new satisfying practice in equal-turn democratic communication. The co-operated RoundTable format is also a very simple tool for conscious self-guided evolution. In school, workplace or other meetings, the topic for the first session in annual conferences is often: "What situations/projects did you leave behind to come here? What could happen here that would be valuable to you in your work or projects back home?"

The second prong is the Triple Bottom Line (3BL), an in-out-in approach. 3BL corporations have *financial, social,* and *environmental* bottom lines, thus accountable for their impact on the whole society. Similarly, 3BL educators consider the whole learner: his/her *cognitive, affective* and *psychomotor* development. In schools, the 3BL prong proposed here is to inspire people to, first, recognize real and observed bottom lines (their own and those of people they supervise or report to), as well as their ideal and intended bottom lines. Second, people are to expand their ideals and perspectives—from one to three bottom lines: their key goals and measures for future sustainability. The 3BL prong is introduced when participants are ready, after a few or a great many sessions with an added suggested topic such as: "What are your three main goals (intended outcomes) for your students, employees, yourself? Are you achieving them? Do your observed outcomes match your intended outcomes?"

The third prong is the TPO Thermostat metaphor, a top-down approach. It develops mastery of a new way to lead among leaders and top management. TPO leaders understand the different natures of their organization's technical, personal and organizational domains (things, people and outcomes) and use a TPO Thermostat metaphor to view and manage

their social systems. When the system (cf. thermostat) is *Off*, they plan. When the system is in *On: Manual*, they deliver resources and information. When the system is in *On: Auto*, they keep a watch and maintain the optimal working environment (cf. around 68 degrees) and allow participants freedom to work on their own. The TPO Thermostat prong is introduced with an added suggested topic such as: "Regarding the RoundTable, 3BL, and the TPO Theory/Thermostat, WIIFM X 2? Or, what's in it for me and mine (my groups)? How do they relate to today's main topic?"
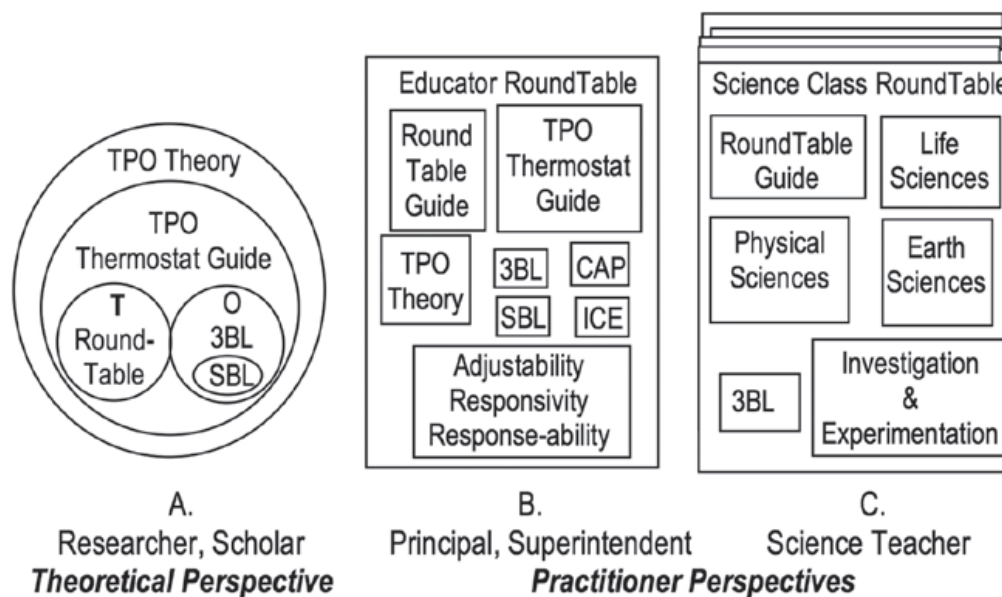
IMPLICATIONS AND PROPOSED NEXT STEPS

With regard to TPO Theory, the RoundTable and Triple Action RoundTable, two general perspectives have been developed: in the ivory tower and on the front lines. As an ivory-tower scholar in systemic school change and renewal, I am interested in the intangible truths and unifying theory. For example, one set of unifying truths regards a characteristic of P, specifically human learning: 1) Knowledge and skills are acquired when the learner *is able to* (cognitively and physically) and *wants to* (affectively) achieve them—when there is an adequate match of the input to the learner's cognitive, affective, and psychomotor, domains (CAP); and 2) All people are learners, so the first truth (learning depends on input plus cognitive, affective, and psychomotor, match) applies to *all* people: students, parents, teachers, principals, superintendents, policy makers, and so forth. A second set of unifying truths regards a characteristic of T, specifically the effective design of a systemic innovation. For an innovation to be successful in a large social system, it has three qualities, abbreviated in the acronym ICE. It is 1) *inclusive:* serving the whole person, the whole group (each class or meeting member), and the whole organization (school, district, organization, etc.). It is 2) *continuing:* occurring regularly—daily, weekly, or monthly. It is 3) *emancipatory:* ideal-based, capable of dramatically boosting learning and community spirit. In this way, people can pick up the new knowledge or skill each at their own pace, for their own purposes.

From the viewpoint of the ivory tower, I begin with TPO theory as the overarching principle—the outside circle in figure 18A. Subprinciples of TPO theory take shape in key designables or things: the TPO Thermostat Guide, the RoundTable, and the goals and measures of the triple bottom line, as well as the social bottom line—which are all embedded inside TPO theory. This organization or hierarchy is illustrated as circles inside of circles in figure 18A as a theoretical perspective.

My front-line viewpoints are illustrated in figures 18B and 18C. Here, the organization or hierarchy is illustrated as squares inside of squares. I begin with the things: the designables and tangibles. I see the regular RoundTable session as the overarching, continuing thing (outside square). It can embed key designables, things, as basic readings (inside squares): including the RoundTable guide, the leader's TPO Thermostat Guide, and the goals and measures of the triple bottom line. In addition to the content in figures 18B and 18C. (the squares) as basic readings in the RoundTable session, they can also become wall charts, visible all the time to everyone—educators in the workroom or conference room, students in the classroom—even when the RoundTable is not in session. Wall charts increase accessibility to an even greater degree.

A.
Researcher, Scholar
Theoretical Perspective

B.
Principal, Superintendent

C.
Science Teacher

Practitioner Perspectives

Figure 18. Organizing Key Concepts for Theory and for Practice

The front-line viewpoints are of two kinds: Figure 18B illustrates the front-line viewpoint of the superintendent, principal, department chair, educational policy maker, and other school-meeting facilitator. These educational leaders and school decision makers are sophisticated learners. Figure 18B illustrates an educator RoundTable that might have six basic readings. Ideally, a thirty-minute RoundTable is held monthly in the same conference room where other planning or staff development occurs. Note that in addition to early basic readings (the three prongs), other clarifying readings can be added—especially on the one key factor in healthy social systems: adjustment capacities, responsivity, response-ability. Other readings and wall charts might review the cognitive, affective and psychomotor domains (CAP) and the inclusive, continuing, emancipatory conditions (ICE).

The other front-line viewpoints are those of classroom teachers. Pictured in figure 18C is the RoundTable that might evolve in a science class in California. Readings and wall charts might be based on the teacher's course description, the district's science educational standards, and the common core standards (California Department of Education, 2009, 2010, 2013). The formats for teachers vary greatly by grade and by subject, illustrated with many squares behind the science teacher example.

As an ivory-tower scholar in systemic school change and renewal, I begin with the abstract—core principles, values, and ideas. On the front lines, as a teacher and meeting facilitator, I begin with the concrete—things, the core practices, and textbooks. Then I pack—or fortify—the core goals, values, and ideals into these core practices and textbooks. Or I supplement the core textbooks and practices with the core goals, values, and ideals. In that way, the practices and textbooks are not cut-up piecemeal.

A Social Science Paradigm Shift: Boulding, TPO Theory, and the RoundTable

Front Line Practice For a Research Project

A research question for an investigation of the Triple-Action RoundTable in a school district might be: *"In what ways and to what extent is the Triple-Action RoundTable inclusive, continuing, and emancipatory?"* A study design chart is laid out in table 2.

Table 2. RoundTable/ICE Study Design Chart

Condition	Criteria: The way and degree to which....	Measures: Of both [1] the Input Design (D) & [2] Outcomes (O)
Inclusive	• Everyone in the group is included; • Every group is appropriately included in the school, district, etc.	• Time and task analysis (D, O) • Count and categorization of RT User Groups (D, O)
Continuing	• It occurs regularly. • It is low-cost. • It is replicable.	• Observation and count (D, O) • Training costs to user mastery (D, O) • Ability to be physically duplicated, photocopied (D, O)
Emancipatory	It fosters: rapid meaningful learning, and community-building.	User views in: Audio recordings, and questionnaires

Toward a More Specified General Theory of Social Systems

One aim of this paper was to advance the social systems paradigm shift, to contribute to the reconceptualization and specification at all levels of theory and practice. Many of the acronyms and figures in this paper are initial concepts, illustrations, and steps toward mathematic or scientific representations. While it is desirable that these concepts and illustrations eventually have precision and scientific merit, it is more desirable to me at this time, in this draft, for them to be an attractive leap out to the ideal for meaningful general theories. My hope is that it will inspire other experts to come forth to refine and identify applications of the TPO, CAP, and ICE premises. Again, in complex human social systems, we need all kinds of expertise to figure out where we are today and where we want to go with regard to public education, our workplaces, our corporations, our societies, and our world.

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