Systems Changes Learning: Recasting and Reifying Rhythmic Shifts for Doing, Alongside Thinking and Making

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Abstract[1]

Entering 2023, the Systems Changes Learning Circle *completed in its fourth year of 10-year journey on "Rethinking Systems Thinking". In a contextural action learning approach, the Circle has elevated rhythmic shifts as the feature that both resonates with practitioners in the field, and fits with a post-colonial philosophy of science bridging classical Chinese thought with Western professional practices. This multiparadigm inquiry recasts and reifies the activities of doing (*praxis*), thinking (*theoria*) and making (*poiesis*). The facility with this approach is deepened through three levels: (i) educating of attention, orienting novices towards contrasting modes of thought; (ii) learning for co-relating, lending a way for practitioners to critically appreciate their situations, and (iii) learning for articulating, aiding mentors to guide groups productively through mutual learning style.*

Keywords: systems thinking; systems change; polyrhythmia; ecological epistemology; yinyang; propensity; Chinese medicine; post-colonial science; action learning

1. Introduction

The *Systems Changes Learning Circle* was formed in January 2019, centered in Toronto, Canada. At inception, a rising interest in a label of "systems

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change" was noticed, with a coherent view of its meaning left unanswered. On this subject, core members of the Circle pledged to meet triweekly in a slow action learning program, on a 10-year horizon. Building on the long tradition with General Systems Theory as primordial to the Systems Sciences, the program is a response to the challenge of "Rethinking Systems Thinking" beyond its 20th century legacy (Ing, 2013). After 3 years of action learning, the Circle discriminates between "systems changes" of (i) "rhythmic shifts" that can be seen as history-making, as compared to (ii) routine patterns that are normally unnoticed as everyday background processes. Predispositions amongst Systems Changes Learning Circle members see:

- *systems*, as socio-ecological wholes, with human beings embedded intergenerationally in manufactured subworlds, coevolving alongside coupled natural biophysical ecosystems, increasingly sympathetic towards non-anthropocentric sustainable development (Gallopín, 2003);
- *changes*, as polyrhythmic in nature, with ensembles of phases that may present as (i) eurhythmia of living in healthy conditions, or (ii) arrhythmia in disturbance either temporarily or pathologically (Lefebrve, 2004); and
- *learning*, as animate beings co-responding in taskscapes, becoming lines of movements or growths gathering to resolve their affairs alongside other species in an entangled meshwork (Ingold, 2011b).

Systems Changes Learning is proposed as a three-word agglutinative neologism. The three words are a recasting (i.e., discourse adjustment) (Pemberton & Watkins, 1987; Watkins & Pemberton, 1987) and reifying (i.e., remaking into a thing) (Burstall, 2000; Vandenberghe, 2015) of a distinct whole, rather than a mere connecting of "systems", "changes" and "learning" as parts. Faced with rhythmic shifts, some systems will internalize history-making changes as a matter of course, while other systems may superficially adapt to deal with conditions situation by situation.

Activities of the Circle, in the metaphysics of Aristotle, give primacy to (i) *praxis*, alongside a collective coevolving of (ii) *theoria* and (iii) *poiesis*.

- *Praxis* can be described as "knowing when, knowing where, knowing what". *Doing* as *praxis* orients towards action with practical ethics, and *phronesis* with a virtue of practical ethics.

- *Theoria* guides action as "knowing why". *Thinking* as *theoria* orients towards research aims to uncover universal truths, with *episteme* as science.
- *Poiesis* rises in importance as "knowing how", as the Circle gains experience that might be replicated in a larger community of practice. *Making* as *poiesis* orients towards producing of craft, towards *techne* as instrumental rationality that might adopted more widely across a community or practice.

While *praxis*, *theoria* and *poiesis* might be advanced separately, a greater aspiration seeks learning across all three, as a weaving. *Praxis*, towards systems changes as practical ethics, could be demonstrated situationally by an individual with intuitive wisdom, without a *theoria* of knowing why. *Theoria* underlies any systems approach, as "knowing why" can abstract from a situation-at-hand to the universal, at the risk of overlooking a different context. *Poesis* traditionally developed by an apprentice observing masters in a community of practice might be learned more rapidly and effectively through the codification of principles formalized into methods. Learning in the Circle has proceeded through *praxis* shaping the body of *theoria* amongst core members, with an eye towards *praxis* guided by the "knowing how" of *poiesis* to be formalized later in the espoused 10-year journey.

Facility towards *praxis*, *theoria* and *poiesis* accumulates at three depths, condensed from a five-stage model of adult skill acquisition (Dreyfus, 2004).
- (1) *Educating of attention*, through novice and advanced beginner skills levels, grasping the contextural (contextual) and situational (Ingold, 2001);
- (2) *Learning for co-relating*, through competent and proficient skill levels, discriminating salient aspects of actions that might be chosen (Hall & Ames, 2016); and
- (3) *Learning for articulating* shifts in styles, through expert skill level, moving on from analytic decision-making to intuitive (Spinosa et al., 1999).

Learning progresses in the mutual engagement and reification of meaning, both by individuals and across the community of practice as a whole (Wenger, 1998).

The dimensions of (i) facility and (ii) activities can be crossed into a matrix, as shown in Table 1 below.

Table 1: Progressing facility in activities with Systems Changes Learning. CC-BY-NC-ND David Ing 2023

	Praxis -- Doing	*Theoria -- Thinking*	*Poiesis – Making*
Educating of attention	§3.1: Behavioral and/or ecological?	§3.2: Changelessness and/or temporality?	§3.3: Causality and/or propensity?
Learning for co-relating	§4.1: Action-agencing	§4.2: Theory-enskilling	§4.3: Methods-weaving
Learning for articulating	§5.1: Action-guiding	§5.2: Theory-building	§5.3: Methods-composing

In the section 2 that follows below, the journey of the Systems Changes Learning Circle between 2019 and 2022 is reviewed. The approach is now labelled as *Contextural Action Learning*. From that history, the current collective body of work is described is increasing depth. In section 3 below, the *educating of attention* opens up novices to more critically examine presuppositions on systems and/or changes. Systems Changes Learning builds on specific schools of thought from the systems movement that might resonate or not resonate with selected audiences. In section 4 below, *learning for co-relating* describes a depth of *praxis*, *theoria* and *poiesis* with which core members of the Circle have gained fluency. This reframing of systems changes, by 2023, is seen as foundational, on which incremental improvements are expected. In section 5 below, the *learning for articulating* is targeted for mentors and method exponents so that practitioners might be guided. Greater precision in language and concepts underlie the metaphors and similes applied in co-learning situations. In section 6 below, prospects for the coming years on the journey are outlined, as the emphasis shifts to *praxis* and *poiesis*, having established *theoria* foundationally.

2. Contextural Action Learning is a longitudinal collective journey

The origins of the Circle followed a rising interest around "systems change" in 2018. With funders and changemakers asserting a need for community building in this field, a common understanding of "systems change" was left undone (Birney & Riddell, 2018). Without that commonality, how might "systems change" be differentiated from a "non-systems change", or a "systems non-change"? Even if we accept that the plural of "systems" is preferred over a singular "system", is a "systemic change" of a whole possible without a change in parts, or other wholes? What makes "systems changes" distinct from "changes"?

In parallel, practitioners interested in "theory of change", "design thinking", and "systemic design" have been relying on incomplete appreciations of the "systems thinking" tradition from the late 20th century. With the global pandemic and political instabilities, there has been a call for systems thinking "to understand this era" (Tufekci & Klein, 2021) and "make sense of the world" (Tufekci & Chakrabarti, 2021). The gap between scholars and "systems literacy" in the general population has widened, as misinformation has become rampant in society (Goede, 2020; Tuddenham, 2016).

Over three years, the *Systems Changes Learning Circle* maintained diligence in an unrushed collaborative effort, whereby a variety of alternative viewpoints and frameworks were examined. The trail of presentations and artifacts reveals not only promising directions, but also approaches that lacked rigorous foundations or explanatory power for practitioners. Establishing a coherent underlying philosophy of science by 2022 (for mentors) allows reasoned guidance (for practitioners), and the reduction of misleading metaphors (for novices).

2.1 Prior 20th century systems research and action learning was recognized by the core group

From a methodological standpoint, the *Systems Changes Learning Circle* espouses a *contextural action learning* approach. The is a minor renaming of contextual action learning, following the lead of Eric Trist in the 1960s.

Trist said "I am a contextualist", referring back to the research of Stephen C. Pepper in the 1930s ([Carvajal et al., 1994](#), p. 32).

For clarity, a label of "contextural appreciation" is preferred over "contextual appreciation" in combining two ideas. Firstly, *context* should not be associated with "text", but instead "texture". As a line or thread added to a texture, "contexture" has a sense of the "action or process of weaving together or intertwining; the fact of being woven together; the manner in which this is done, texture" from medieval Latin use as a noun and verb in France and Italy to the 17th century ([OED, 1989](#)). In the 1930s, the systems sciences had a philosophical turn in the systems sciences: from mechanical parts fitting together, towards organisms living within a texture. This turn influenced research into psychology ([Pepper, 1934](#)), and foreshadowed major figures advancing General Systems Theory, with Ludwig von Bertalanffy visiting mathematical biologist Nicolas Rachevsky in Chicago in 1937. This understanding of texture as a weave in time -- rather than text as a medium of communications -- has been described as "the important legacy of the cultural turn in the social sciences" ([de la Fuente, 2019](#)). Secondly, *appreciation* should be understood in the sense of "appreciative behaviour" making (i) judgments of value and (ii) judgments of reality ([Vickers, 1963](#), [2010](#)). A living system is more than a machine. Living beings can autonomously behave according to appreciations of the textures alongside their becomings, and the contextures within which they co-responds.

The *Action Learning Group* at York University in Toronto was guided by Eric Trist, in the late stages of his career in the 1980s. At that time, there was concern that much of systems work was becoming reductively analytical, preoccupied by looking inward. Contextual awareness was a call to appreciate a system in its changing environment, as an outside-in perspective.

> The term 'contextualism' can also be applied to current expressions of 'environment' as a generic and encompassing condition (rather than in its more limited application to specific physical and functional aspects of setting). Emerging contextual awareness appears to be undermining some of the social and institutional barriers that have resisted the use of open systems and environmental thinking …. Contextual perspectives of such

complex systems of problems emphasize their broad-ranging and overlapping character. (Morley, 1989, p. 164).

The group at York University saw *learning* as the basis for integrating organizational change perspectives within settings of uncertainty. A contrast could be made with the 1950s sharing of experiences associated with Reginald Revans, emphasizing "business managers operating within the internal environments of their organizations" (Morley, 1989, p. 178). With the open systems approach of Trist, action learning at York University was:

> … [a] "form of a self-directed, co-learning process carried out in real-time settings by long-term stakeholders and applied to concerns that were frequently related to persistent and complex problems" (Morley, 1989, p. 178).

An open systems approach to action learning erases the line separating researchers (outside) from practitioners (inside), that characterizes action research conducted dispassionately.

> Because action learning can be regarded as a natural extension of action research, comparisons between the two are useful. The basic characteristic common to both is the focus on collaboration between the "outsider" (researcher, consultant, scientist, facilitator, advocate, etc.) and the "insider" (participant, stakeholder, practitioner). [….] In action-learning settings, the output is an integrated one — mutual learning on the part of insiders and outsiders (Morley, 1989, p. 180).

This approach has roots in the field theory in social psychology from Kurt Lewin, the psychoanalytic theory of Wilfred Bion, and general systems theory from Ludwig von Bertalanffy. The *Systems Changes Learning Circle* embraces this spirit of collaborative learning.

2.2 From 2019 through 2022, learning about systems changes has been open and collaborative

Towards mutual learning of insiders and outsiders, members of the *Systems Changes Learning Circle* have served as convenors and organizers at a series of events, either open to the public and/or subsequently shared on the Internet.

In January 2019, the *Systems Changes Learning Circle* was initiated with a call for participation at the monthly *Systems Thinking Ontario* meeting (Ing, 2019b).

In February 2019, the parallel development of pattern language with the systems approach and wicked problems of 1970s Berkeley was shared as a session on "Systems Changes: Learning from the Christopher Alexander Legacy" (Ing, 2019c).

In May 2019, at the biennial conference of the *Canadian Society for Ecological Economics*, a workshop on the "Systems Changes research program" shared a map of some of preliminary ideas was shared. This led to a magazine article "Ecology and Economy: Systems Changes Ahead?" (Ing, 2019a).

In October 2019, the design community was introduced to paying attention to the learning-in-progress on Systems Changes Learning (Khan & Ing, 2019).

From January 2020 to March 2020, the learning-in-progress was shared over four lectures in the Systemic Design course of the master's program in Strategic Foresight & Innovation at OCADU:

- "Are Systems Changes Different from System + Change? Recasting and reifying systems thinking with theory of change" (Ing, 2020a);
- "Why (Intervene in) Systems Changes? Errors, attention and traps through an ecological understanding" (Ing, 2020b);
- "Whom, when + where do Systems Changes situate? Value(s), services and socio-technical affirming phronesis" (Ing, 2020c); and
- "How do Systems Changes become natural practice? History-making, commitment, argumentation + pattern language" (Ing, 2020d).

Lecture slides and recordings of the talks reflect an interim structuring of the thinking from discussions within the Circle throughout 1999.

In October 2020, three sessions with parallel content were customized to the interests and vocabularies of the audiences:

- for the RSD9 (Relating Systems Thinking and Design) symposium, a workshop on "Reordering Our Priorities through Systems Changes

Learning" was conducted online for a design-oriented audience ([Khan et al., 2020](#));

- for Systems Thinking Ontario, a presentation on "Theoretical Grounds, Pragmatic Grounds: Methods for Reordering our Priorities through Systems Changes Learning" was reviewed with the systems community ([Ing, 2020f](#)); and
- for a Global Change Days Beacon event, a workshop on "Learning With Humility: Systems Thinking and Re-Ordering Priorities" asked changemakers to explore a preliminary framework ([Okamura et al., 2020](#)).

These sessions revealed that socialization of groups with distinctions between "the urgent" versus "the important" would require some wrestling with the idea, gradually leading to some insights.

In November 2021, a dialogue session for RSD10 on "Friends or Foes: Theory of Change, Systemic Design (Thinking), Systems Changes Learning" explored the compatibility across the variety of subgroups centered on different features ([Khan & Ing, 2021](#)).

Also in November 2021, a precursor to writing this article, a presentation at the first CSRP Institute symposium on "Progress on Systems Changes Learning: Coevolving towards Rethinking Systems Thinking" first outlined the structure to be more fully explicated ([Ing, 2021](#)).

2.3 In March 2022, materials from the first formal workshop were released as open access

In a first-of-a-kind release, a workshop on "Systems Thinking through Changes" for the Canadian Digital Service (CDS) was a milestone ([Code for Canada & Systems Changes Learning Circle, 2022](#)). In contrast to this written article targeted for researchers looking for rigour, the CDS workshop was developed for an audience of technical business professionals with limited or no experience with systems thinking. With rhythmic shifts as the centering focus, shallower points of entry included metaphors of (i) surfing on boards propelled by waves; and (ii) musicians in ensembles weaving their lines together. After the one-hour introductory presentation, three CDS teams deliberated for three hours, following an action learning workbook guide.

The groups each reported insights into symptoms that might be further investigated as pathologies for correction.

Success on a singleton practical engagement is encouraging. The balance of this article delves deeper into the Systems Changes Learning approach, following Table 1 above, row-by-row, and cell-by-cell. Section 3 below is the first row, on educating of attention.

3. Educating of attention elevates learning through engaging, moving, becoming

Many systems change initiatives get wrapped up in the anthropocentricity of human cognition and power relations. This leads to efforts towards (i) presuming that some parties have not appreciated the reasons whereby they should change their mind(s) about a subject, and then (ii) imploring and/or instituting regulations that induce and/or force behaviour accordingly. A provocative comparison asks whether beavers might approach similar circumstances of rhythmic shifts through primarily social relations. Beavers are animate beings who construct their own built environments. They act as individuals and as families, co-responding with changes in their environments. Beavers are part of the natural world, just as are human beings.

The mindset of *Systems Changes Learning* challenges the centrality of intention, and purpose-oriented, teleological philosophy. Not all changes in the world should or can be expressed in terms of goals. Surely, beavers have the instinct to ensure their lodges are in inhabitable conditions before winter sets in. Beavers build and maintain dams to increase the abundance of water, into which they retreat when feeling insecure (Danilov & Fyodorov, 2015). Goal-oriented purposive behaviour by individuals within finite time horizons does not sustain into ideal-seeking purposeful behaviour in groups (Emery, 1977). The nature of beavers is widely accepted. The nature of human beings in social-ecological systems is open to debate.

Attention often overrules intention. An action of "walking" prioritizes attentionality, as compared to "going for a walk" as intentionality. In moving, attentions open up to engaging with the world, while intentions "are but

milestones thrown up along the way, more often than not revealed in hindsight" ([Ingold, 2017](#), p. 19). The process of one person learning from another can be a guided rediscovery, whereby the knowledge of an expert is situationally afforded through apprenticing as observing, reflecting, and replicating. This is an education of attention. The expert is attuned to picking up critical features of the environment that a novice fails to notice. A tutor sets up situations whereby a novice can interactively look, listen, and feel for himself or herself, more than being just a passive recipient in a "transmission of representations" ([Ingold, 2001](#)).

3.1 Is our attention on the behavioral and/or ecological? (Praxis – Doing)

Living systems are open to their environments, in mutual engagement. This conjoining in fluidity can be seen from two viewpoints: (i) the behavioral, and (ii) the ecological.

In the development of psychology from the 1950s, the challenge has been not only to appreciate "what's inside your head", but also recognize "what your head's inside of" ([Mace, 1977](#)).

Behavioral psychology, in studies such as stimulus of food leading to a dog salivating, centered on understanding "what's inside your head". Perception was thought to add order and meaning to the sensation that external stimuli evoked.

Ecological psychology was pioneered by J.J. Gibson, derived from his experience as an officer in the U.S. Army Air Force. The definition of motion parallax was extended to better describe the spatial judgement of pilots successfully landing aircraft ([Gibson et al., 1955](#)). This led to an understanding of mutuality of animal and environment, and introduction of the term *affordance* as an ability of the environment to contribute to the interactivity of the agent ([Greeno, 1994](#)).

This perspective has matured into an ecological epistemology ([Carvalho, 2016](#)). Complementary to the work on ecological psychology ([Gibson, 1979](#)) is the recursive epistemology of Gregory Bateson ([Harries-Jones, 1995](#)) and ecological anthropology ([Ingold, 2012](#)).

Systems analysis – with analyzing as "taking things apart" -- emphasizes part-whole relations, as does a behavioral epistemology that aims to understand "what's inside". Systems thinking with a strong orientation on synthesis – with synthesizing as "putting things together" – is elevated with the importance of whole-whole relations and "what's outside", through an ecological understanding (Trist, 1992a).

3.2 Is our attention on changelessness and/or temporality? (Theoria – Thinking)

Two ways of seeing nature, since about 500BCE, have set how human beings negotiate with themselves, and in their world(s) (Hawk, 1999).

A philosophy based on *stability* sees reality as a *changeless* state. Reality was defined as "that which did not change", and universals. Parmenides of Elea was a proponent of this changeless state, extending the theme of idealization from Plato. In Chinese history, parallel views by Confucius influenced systems of governance, concepts of law, and the formation of social institutions. Systems changes through a lens of stability puts permanence into the foreground, with transitions between equilibrium states in the background as relatively brief occurrences. Becoming can be associated with a state of change as continual.

A philosophy based on temporality sees reality as a *state of change*, rather than a change of state. Reality was defined as "that which did change", and contextual appreciation. Heraclitus of Ephesus advocated a doctrine of constant changing (universal flux) as an ancient process philosopher, and opposites coinciding in unity (D. W. Graham, 2021). In a compatible Chinese philosophy, but with a slightly different emphasis, "Heraclitus focuses on the unity of opposites, and Laozi on the balance of opposites" (Yu, 2015, p. 116). Systems changes through a lens of temporality puts movement into the foreground, with standstill moments as pauses or rests. Becoming can be associated with a state of change as continual.

In systems theory, *structure* is an arrangement in space; *process* is an arrangement in time (Gharajedaghi, 2007). When looking at a structure (e.g., a mountain), the viewer should recall that the structure is actually a slow

process (i.e., the mountain does change over time). "In an evolutionary view, the *event* is reality, not any structure such as space or matter" ([Jantsch, 1975](#)). A processual view sees living systems as more than a series of static states. "The fact that organic processes never represent a mere sum of single structurally fixed processes, but to a greater or less extent always have the character of processes determined within a dynamic system, gives them adaptability to changing circumstances and regulability following disturbances" ([von Bertalanffy, 1952](#), p. 18).

Practitioners of change management commonly follow three steps (unfreezing → moving → refreezing) attributed to Kurt Lewin, even though Lewin never wrote that triplet ([Cummings et al., 2016](#)). More recent organization theories that place primacy on change and becoming are based on process philosophy ([Nayak & Chia, 2011](#)). From anthropology, the landscape as naturalistic "known to those who dwell therein, who inhabit its places and journey along the paths connecting them" has been temporalized with a culturalistic view of a taskscape as "an array of related activities" ([Ingold, 2000](#)).

3.3 Is our attention on causality and/or propensity? (Poiesis – Making)

Positions on whether nature is ever wrong are more philosophical than scientific, with multiple views evolving over time ([Ducarme & Couvet, 2020](#)). Human beings have will, a nature to choose between different courses of action. Since humans are not infallible, we can benefit by learning as we correct our mistakes. Decision-making mistakes include: (i) *errors of commission*, doing something that should not have been done; and (ii) *errors of omission*, not doing something that should have been done ([Ackoff, 1994](#)). Individuals vary in their orientations towards planning as (i) *reactivists* who seek to return to a previous state by unmaking relevant intervening changes; (ii) *inactivists* who are satisfied with the current state and try to prevent changes; (iii) *preactivists* who believe the future will be better than the present and the past and seek to accelerate change; and (iv) *interactivists* who regard the past, present and future as a mess to be planned for, and seek to develop through maximizing their ability to learn and adapt ([Ackoff, 1981a](#)).

Rethinking a science of systems may involve examining the underlying philosophy of science. Classical Chinese thinking embeds *wèi* (為) and *wú wèi* (無為) as primordial.

> *Wei* meant application of the force of will-power, the determination that things, animals, or even other men, should do what they were ordered to do, but *wu wei* was the opposite of this, leaving things alone, letting Nature take her course, profiting by going with the grain of things instead of going against it, and knowing how not to interfere (Needham, 1964, p. 402).

Wú wèi is often translated badly as "non-action" (Lai, 2003). A better interpretation is wèi as "conscious action", and wú wèi as "unpremeditated, nondeliberative, noncalculating, nonpurposive action (or more accurately, behavior)" (Schwartz, 2009, p. 187). The "unpremeditated" has conceptual similarity in the organization science of the early 1940s, when Wilfred Bion made a breakthrough in the "Leaderless Groups Project" for screening military candidates. Rather than asserting authority on a testing task, leaders were "left to emerge", obviating competitive dysfunctions in favour of improving collective capacity through the sharing of common experiences (Trist, 1992b). These foundations were incorporated into the design of self-directed workgroups in Socio-Technical Systems Theory, as developed by the Tavistock Institute for Human Relations.

A predisposition towards wèi as willful action is illustrated in search of "excellence" that entered orthodox management thinking in the 1980s (Peters & Waterman, 1982). "Bias for action" has become the first of eight commandments for management in Silicon Valley (Peters & Swisher, 2018). In the alternative style of *wú wèi*, activists are encouraged to step back to wait for the right action that will produce greater effectiveness, working with the natural order while holding egos in check (LaVigne & Legault, 2006). This style follows ancient Chinese strategic thinking on propensity as the "potential energy within a situation" that would be exploited by military generals to their advantage. "[A] Chinese sage is inclined to concentrate his attention on the course of things in which he finds himself involved in order to detect their coherence and profit from the way that they evolve" (Jullien, 2004, p. 16).

Western philosophy, back to Aristotle, reckons that wisdom comes from having causal explanations of being. Classical Chinese philosophy doesn't rely on this principle in the interpretation of nature. Rather than seeking causality as an external element from an antecedent, propensity reflects an internal understanding of the disposition of things into actuality. "In the context of natural phenomena and in first philosophy, this *ineluctability of tendency* can be expressed by the term *shi*, translated as either 'tendency' or 'propensity'" (Jullien, 1995b, p. 221). "At the end of the whole chain of connections which accounts for the great process in which the world is engaged, the term 'propensity' designates both the particular circumstances characterizing the various stages in the process and the particular tendency produced in each case (Jullien, 1995b, p. 222).

Summarizing on the education of attention, prospective changemakers are asked to reflect on presumptions of (i) the behavioral and/or ecological; (ii) changelessness and/or temporality; and (iii) causality and/or propensity.

- Under conditions where (i) the behavioral, (ii) changelessness and (iii) causality predominate, the path forward may be linear and obvious. An approach heeding the Lewinian three steps (unfreezing → moving → refreezing) may be sufficient.
- Under conditions where (i) the ecological, (ii) temporality and (iii) propensity predominate, dealing with wicked messes may call for more deliberation (Mitroff, 2019). Changes from outside as well as inside a system of interest, in non-linear time with outcomes coloured by predispositions are a tangle.

The former cases take a perspective of system complicatedness; the latter cases take a perspective of system complexity.

> System complexity is observed from outside the bounds of the system, from its context. The system is seen as whole and the parts disappear into the integration of the whole. The system boundary works to integrate signal both inward and outward. System complicatedness is observed at a lower level where the parts are seen as separate and counted. The surface of the whole cannot be seen or is not given attention at that lower level that discusses complicatedness (Allen et al., 2018, p. 43).

The *Systems Changes Learning* approach may be excessive for complicated issues. For complex issues, alternative paths include (i) placing trust in a unfolding course of nature, or (ii) accepting perspectives of an alternative philosophy of science.

Section 4 below invites practitioners to engage in the richness of row 2 of Table 1 **Table 1**above, *learning for co-relating*.

4. Learning for co-relating rhythmic shifts reorders fields spatially and temporally

Rhythmic shifts are the central feature put forward for appreciating systems changes. Living systems have rhythms internally, both conscious and unconscious, and dwell in worlds with a multiplicity of rhythms. Entering conversations about rhythmic shifts dodges the challenge of initially getting bogged down in defining "systems change", e.g., "what is a system?", "is that change systemic?", "is everything a system?", "what isn't a system?". An inductive approach that leads novices inductively is preferred, expanding on intuitions they already hold, rather than to overload learners with definitions in a reductive style. Coherency between *praxis* and *poiesis* with *theoria* encourages moving beyond simile (i.e., this is like) and metaphor (i.e., this poetically is). Narratives carefully crafted can aid comprehension via analogical reasoning (i.e., this is similar to) ([Bartha, 2019](#)) and correlative thinking (i.e., this compares and contrasts with) ([A. C. Graham, 1986](#); [Hall & Ames, 2016](#)).

Our interest in rhythmic shifts in living systems is not just in biology, but more broadly towards the sciences of ecology ([Schneider & Kay, 1994](#)). Further, living systems are anticipatory holons, whereby selection, metabolism, replication, and repair entail sustainability ([Kineman, 2019](#)).

To underscore that rethinking can be made easier to understand, an example can be presented to make the abstract more concrete: rhythmic shifts in human movement in a world dealing with the responses to the Covid-19 pandemic. Unlike untamed wildlife that share in our world, human beings conforming with social contracts of kinship and citizenship have been

encouraged and/or regulated to stay near home. Freedom of movement has long been recognized in the Universal Declaration of Human Rights (United Nations, 1948). The pandemic has called for clarity on emergency measures so that the "best response is one that responds proportionately to immediate threats while protecting human rights and the rule of law" (Guterres, 2020). Messages include "No country can beat this alone", and "When we recover, we must be better than we were before". There are few whose lives have not been impacted – and will not be impacted in the future -- in personal, social, and economic ways. The combined effect of (i) guidance by public health officials, (ii) regulations by federal, regional, and municipal governments, and (iii) embedded cultural beliefs across networks of kin and friendship has fractured everyday social practices that were previously unarticulated.

In early 2020, the pandemic introduced so many rhythmic shifts to our lives that it was easy to get overwhelmed. Everyday routines became disrupted. Travelling outside the country, let alone one own's neighbourhood, became difficult, if not outlawed.

Dwight D. Eisenhower said "the urgent are never important, and the important are never urgent" (O'Toole, 2014). That is a distinction in time. For a second dimension, the local and the distant are overlaid in a texture that represents a spatio-temporal field (Ing, 2020e; Pepper, 1934). The myriad of rhythmic shifts that we're facing might be placed on a 2x2 matrix, as shown in Figure 1 below.

Distant	Rhythmic shifts that call for *Expediting trauma emergencies*	Rhythmic shifts that call for *Organizing operating room teams*
Local	Rhythmic shifts that call for *Summoning battlefield medics*	Rhythmic shifts that call for *Scheduling neighbourhood clinics*
	Urgent	**Important**

Figure 1: Mapping rhythmic shifts at hand. CC-BY-NC-ND David Ing 2023

Following parallels of healthcare services alternatives, situating spatio-temporal distinctions lead us to opportunities to choose from a variety of actions.

- *Local and urgent* rhythmic shifts, such as life-threatening injuries in war, call for summoning battlefield medics to the front line. It was only in 1940 that Henry Bethune "designed operating equipment, which included a collapsible operating table, antiseptics and sterile gauzes that could be packed in wood boxes and brought to the battlefields on the backs of three mules" (Deslauriers & Goulet, 2015).

- *Urgent and distant* rhythmic shifts in urban areas typically expedite ambulances towards trauma centers, potentially bypassing nearer hospitals with conventional emergency rooms. The first two trauma centers in the United States were started in 1966 at San Francisco General Hospital and Cook County Hospital in Chicago (Trunkey, 2000).

- *Local and important* rhythmic shifts in the modern day are the responsibility of public health departments, who may run neighbourhood medical clinics. The adulteration by dairy producers in the 1890s led to the New York City Health Department distributing free milk for children at depots sponsored by philanthropists. This led to a policy shift in 1908, coordinating the formation of a Division of Child Hygiene, that would employ school inspectors and nurses, as first program in preventative medicine (Duffy, 1974).

- *Important and distant* rhythmic shifts are typically handled by organizing teams of medical specialists into an operating room. Medical journals in 1850 mentioned New York Hospital as the best in surgical practice in the city, a turn from the convention of procedures conducted in open wards, prior to the introduction of anesthesia in 1846 (Duffy, 1968).

In modern societies, human beings are fortunate (and unfortunate) to afford these alternatives to deal with different situations our lives. In a well-functioning society, individuals play roles in handling rhythmic shifts in a variety of systems, according to their proximities, interests, and skills.

Discussing rhythmic shifts should be naturally understandable to the layman, with more rigorous definitions available to those learned. Changes can be

categorized as: (i) *shifting between stages*, e.g., from feeling sick to feeling better, as rhythms internal to a system; (ii) *shifting behaviours*, e.g., committing more time to exercise, or consciously going to bed earlier, as rhythms of a system as a whole in its fields; and/or (iii) *shifting regimes*, e.g., switching jobs to reduce stress, or moving geographically for better weather, as rhythms outside the system, in the larger ecology. Individual preferences and group dynamics towards rhythmic shifts are readily observed. Some prefer a simpler life with fewer changes and surprises, while others prefer the thrill of unanticipated changes.

A guide who is more cognizant of the design of inquiring systems eschews self-sealing perceptions of change as an event with a defined beginning and end. An unbounded mode of inquiry in an open system that enlarges the constellation of changes by sweeping in additional information (Churchman, 1971; Mitroff & Linstone, 1993). In the original definition of wicked problems, a "satisfying" or "good enough" solution would be an improvement (Rittel & Webber, 1973). In a situation that becomes as cancerous as a wicked mess, "the most likely parts of a mess will not only hook up, but definitely cause major crises" (Mitroff, 2019, p. 3).

4.1 Action-agencing, as doing, is learning for co-relating shifts (Praxis – Doing)

When challenged with dealing with rhythmic shifts, systems thinkers might better appreciate from the experiences of "learned professions" such as medicine and law. A reflective practitioner exhibits not only knowing-in-action, but also reflecting-in-action (Schön, 1983). *Knowing-in-action* is ordinary practical knowledge that an individual might be unaware of having learned, and internalized. *Reflecting-in-action* is thinking while an individual is doing, as in "finding a groove" in baseball through "learning to adjust once you're out there", or as in improvising in jazz, interweaving contributions towards a coherent collective performance. *Reflecting-in-practice* goes beyond technical rationality as specialized, firmly bounded, scientific, and standardized knowledge within a profession, open to continuing learning.

In a world of change, rhythmic shifts in one system may or may not be co-related to rhythmic shifts in another system. In agencing, "the agent is inside

the process of his or her action, inside the verb, not separate from it" ([Ingold, 2017](#), p. 17). In collective decision-making, this relates to "skin in the game", "having an exposure to the real world, and paying a price for its consequences, good or bad" ([Taleb, 2018](#), p. 10). In cases where beneficiaries or funders of changes might not be primary in a named system of interest, they might still have positive or negative influence on the downstream texture. Unintended consequences "may emerge as changes made within one part of the system may adversely affect other parts. Often, these problems are much worse than those addressed initially" ([Pourdehnad et al., 2011](#), p. 2).

In praxis, a focus on systems changes can take cues from healthcare professionals. Physicians have vowed to a Hippocratic Oath since 1508 in Germany, eventually becoming a standard by 1804 in France. "Hippocrates came closest to issuing this directive in his treatise Epidemics, in an axiom that reads, 'As to diseases, make a habit of two things – to help, or at least, to do no harm'" ([Markel, 2004](#), p. 2026). The pattern of praxis can be depicted as a process hub, with four process spokes, in a Figure 2 sketch below following the conventions of an Object Process Diagram ([Dori, 2016](#)).
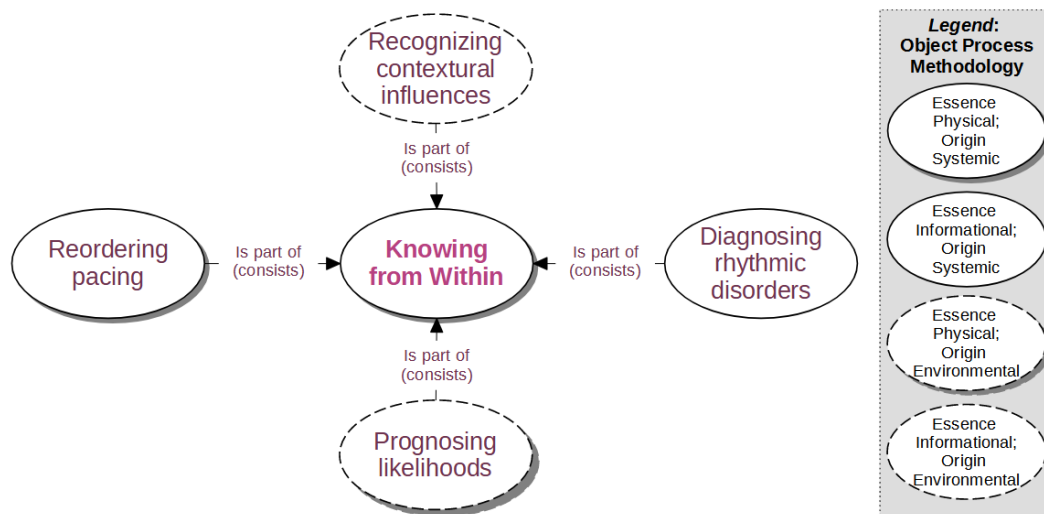

Figure 2: Praxis process hub with four process spokes (as an Object Process sketch). CC-BY-NC-ND David Ing 2023

Object Process Methodology enables modeling with clarity. Consistent with the processual thinking associated with Systems Changes Learning,

modelling put processes before structure with the basic construct that "a process is a thing that transforms an object". Then distinctions are made between (i) essence as physical or informational; and (ii) origin as environmental or systemic. Relations between OPM things are detailed with different arrow heads, and tools (e.g., OPCAT, OPCloud) generate Object Process Language (OPL), as the Object Process Diagram (OPD) is created.

4.1.1 *Knowing from Within* **is physical in essence, systemic in origin**: Practices on systems changes center on knowing from within. With a living system, knowing is appreciated beyond a conscious and cognitive sense, e.g., a body "knows" how to heal itself without thinking. Systems open the world may take in resources or cooperate with others, but real change for the system is unlikely without its knowing.

A living system of interest has a physical identity, even as it systemically changes over time. Healthcare professionals assess not only the current state of an individual, but also the personal history of the subject leading up to current conditions. Institutions recognize families and incorporated entities, and may recognize "grandfathered" clauses when regulations change. That living system has a physical essence, even if the label or name changes. Thus, a person who marries and takes the surname of his or her spouse changes informationally but not in physical essence. The origin of change in a living being is systemic, through adaptive behavior and learning.

Adaptive behavior, in an open system, relates to homeostasis, as the capacity to maintain morphology (i.e., outward appearance, form and structure) both through conscious and unconscious processes (François, 2004b). Adaptive behavior "safeguards or enhances the survival ability of a living system" and "maintains the essential variables within physiological limits" (François, 2004a). A functional individual or system can adapt in four ways: (i) *other-other adaptation*, responding to an external change by modifying its environment; (ii) *other-self adaptation*, responding to an external change by modifying itself; (iii) *self-other adaptation*, responding to an internal change by modifying its environment; and (iv) *self-self adaptation*, responding to an internal change by modifying itself (Ackoff & Emery, 1972, p. 124). The capacity to adapt does not necessarily involve learning by the system.

Learning, in the behavioral science developed by Gregory Bateson, is classified with interactive communications as logical types, extending the mathematical philosophy of Alfred North Whitehead and Bertrand Russell. "Change denotes process. But processes are themselves subject to 'change'. The process may accelerate, it may slow down, or it may undergo other types of change such that we shall say that it is now a 'different' process (G. Bateson, 1972, p. 283). Bateson developed his appreciation for types of learning while observing dolphins (Visser, 2003):

- "Zero learning" was the label for a dolphin that would not respond to training stimuli.
- "Learning I", or proto-learning was exhibited by dolphins who could learn to respond to a stimulus in a repeatable pattern (e.g., doing a trick to receive the reward of a fish).
- "Learning II", also known as deutero-learning or double-loop learning, rewarded not for repeating an old trick, but instead for exhibiting a new trick. Dolphins proficient in proto-learning would enter a double-bind pattern of frustration at not being rewarded for an old trick, and might (or might not) learn that rewards were being given only for new tricks.
- "Learning III", also known as trito-learning or triple loop learning, involves the ability to cope with entirely differently sets of alternatives. Beyond dolphins, this type of learning is observable in students have been immersed for years of international studies. The students become fluent not just in the second culture, and are open to the contexts of environments beyond their direct experience.
- "Learning IV", as phylogenesis (of tribe or species) with ontogenesis (of an individual living being), can be best characterized as genetic change, beyond the capability of human will, but not beyond the wisdom of evolution in nature.

This categorization of learning departs from the prevailing theory of operant conditioning of B.F. Skinner reflected in the simpler proto-learning. Deutero-learning incorporated Gestalt learning, the acquisition of insight and apperceptive habits (i.e., relating new percepts to past experiences).

A no-win constraint at a lower level of learning may be resolved if a higher level can be attained. The situation and/or the facility for learning may,

however, present challenges to self-image that an individual or organizational group might not be prepared to confront. Pathological deutero-learning can lead to double binds: individuals learn to discern patterns under different conditions, with prior experiences reinforcing the appreciation that different behaviors lead to different consequences from action (Visser, 2007). In proposing a theory of schizophrenia, "incongruence or conflict between context and meta-context" may be observed, with the double bind as a "dilemma either of being right in the primary context or of being right for the wrong reasons or in a wrong way" (G. Bateson, 1960, p. 20). A theory of alcoholism presents "a converse matching between the sobriety and intoxication, such that the latter may be seen as an appropriate subjective correction for the former", "more specific than that provided by mere anesthesia" (G. Bateson, 1971, p. 2). On the report of his daughter, Mary Catherine, double binds were not limited to pathology, as Gregory Bateson said "Nature is a dirty, double-binding bitch" (M. C. Bateson, 2005, p. 1).

Systems Change Learning centers on *knowing from within* the system of interest, while co-responding alongside other systems of influence in ecologies.

> To know things you have to grow into them, and let them grow in you, so that they become a part of who you are. [….]
> It is, in short, by watching, listening and feeling – by paying attention to what the world has to tell us – that we learn. [….]
> This kind of learning aims not so much to provide us with facts about the world as to enable us to be taught by it (Ingold, 2013, pp. 1–2).

While external parties might espouse a rhetoric determining leverage points for change, covert operations or coercion are unlikely to change the nature of the targeted individuals or populations on a longer horizon. Lasting change requires a system to learn, and learning occurs from within.

Having covered the hub of Figure 2 above extensively, praxis can cycle through each of the four spokes sequentially. Formally, *Knowing from Within* consists of (i) *Recognizing contextural influences*; (ii) *Diagnosing rhythmic disorders*; (iii) *Prognosing likelihoods*; and (iv) *Reordering pacing*.

4.1.2 *Recognizing contextural influences* **is informational in essence, environmental in origin**: While some systems changes are internal in origin (e.g., an individual feels sick, or a team member notices some organizational dysfunction), a practical question is whether there has been a shift of significance externally from the environment. Thinking temporally, the rhythm of the system may have fallen out of synchrony with world in which it engages.

With the multitude of shifting contextual influences, at varying locality and urgency, recognizing the rhythms most salient to the system of interest requires some sorting of priorities. The relation between the system of interest and system(s) of influence might be connected directly and physically, or linked indirectly with news of changes received informationally.

4.1.3 *Diagnosing rhythmic disorders* **is informational in essence, systemic in origin**: For medical professionals, "Diagnosis provides clinicians with the means to organise and interpret a range of information provided by patient symptoms, signs, tests, and investigations as the basis for decision-making" (Croft et al., 2015, p. 2). Although a patient might request a wellness assessment, most visits to professionals are by a subject exhibiting symptoms who merits a deeper investigation.

Living beings have many subsystems working together, so a typical complaint would be feeling "off". The clinician may be able to observe some symptoms physically, yet most often relies on the patient providing information on "where does it hurt"? Lab tests may provide more clues on which findings can be based. Diagnosticians rely on experience and judgement to conclude precursors that have led to the current condition. A scientific approach reduces the set of probable explanations for the malady.

4.1.4 *Prognosing likelihoods* **is physical in essence, and environmental in origin**: While diagnosing seeks answers to the "what" and "why" of symptoms, prognosing infers future outcomes. "The science of prognosis is concerned with improving the precision, accuracy, and usefulness of measures of likely future outcomes." (Croft et al., 2015, p. 4). A prognosis may be possible without a complete diagnosis. Every few years, I get a pain in my left foot that doctors haven't figured out, but the symptoms generally go away in about 10 days. My self-prognosing infers that the ailment is minor, and my body will heal itself. The diagnosis remains uncertain.

4.1.5 *Reordering pacing* **is physical in essence, systemic in origin**: Having observed rhythms informationally on the other three spokes, reordering pacing is action-oriented and physical. At a whole or in parts, accelerating or decelerating a rhythm may be reformational (i.e., restoring synchrony amongst parts) or transformational (i.e., functionally altering behaviours or capacities to respond).

Pacing layers were first introduced metaphorically as shearing layers in built environments, e.g., changing services is constrained by the slower-moving structures, while the space plan of non-load bearing walls is constrained by services (Brand, 1994). This application of hierarchy theory later applied to describe health civilizations, with nature as the slowest pace, with culture faster, and then governance, infrastructure, commerce, and fashion (Brand, 1999, 2018). Reformations within a pacing layer are considerably simpler than transformations across pacing layers.

In communications about reordering pacing, the Language/Action Perspective enables productive coordination between parties. Distinctions can be made between four types of language interactions: (i) conversations for actions; (ii) conversations for clarification; (iii) conversations for possibilities; and (iv) conversations for orientation (Winograd, 2006). Commitments between parties cascade through sequences of requests and acceptances, fulfillment and recognition of completion (Flores, 1998; Winograd & Flores, 1986). Obligations can be further formalized in four ways: (i) commitment to produce a deliverable; (ii) commitment to follow a process; (iii) commitment to provide a capability; and (iv) commit to contribute to a relationships (Ing, 2008).

Praxis on *knowing from within* is informed by *theoria*. In the section 4.2 4.2 Theory-enskilling, as thinking, is learning for co-relating shifts (Theoria – Thinking)below, educating practitioners on the science underlying their practice is described.

4.2 Theory-enskilling, as thinking, is learning for co-relating shifts (Theoria – Thinking)

Synthesis combines parts together in a whole. Analysis breaks wholes into parts. In authentic systems thinking, "synthesis precedes analysis" and "the thing to be explained is treated as part of a containing whole" ([Ackoff, 1981b](#), pp. 16–17). Much of espoused systems thinking is unfortunately analytic and reductive.

To strengthen the foundations in systems theory, our research draws from the philosophy of science underlying classical Chinese medicine.

> [The] ancient Chinese *philosophy* within which [Classical Chinese Medicine] was/is embedded may be said to imply process-ontology – it considers events and processes to be foundational, rather than things. Furthermore, it implies complex causal relationships between events and processes which may be said to multi-factorial and non-linear. Such a *philosophy* is *Wholist* in orientation – the universe and everything in it, including human beings, constitute *Wholes* which are different from the sum of the parts, and which in turn are related as well as inter-related with other *Wholes* ([Lee, 2017a](#), p. 2).

Placing rhythmic shifts as pre-eminent in Systems Change Learning exercises a process ontology. The label of "contextural dyadic thinking" is preferred over the "contextual dyadic thinking" ([Lee, 2017b](#), p. 217) to emphasize that the dyad is woven in with the contexture. The next sections outline (i) the relation between contexture and the *yinyang* dyad; (ii) contexture as co-responding rhythmic lines; and (iii) the *yinyang* dyad as rhythms that might shift into pathologies. Appendix A Appendix Abelow reviews some sources on *yinyang* thinking. For scholars, the implications on systems thinking with such a deep philosophical turn is explicated more fully in section 5.2 below.

4.2.1 Contextural dyadic thinking involves contexture consisting of yinyang dyads: Living systems have rhythms, in subworlds that have rhythms. Most of the time, it's the shifts that get our attention. To reframe our systems thinking perspective, the dyadic rhythms of a system of interest are portrayed in a contexture of a musical score in Figure 3 below.
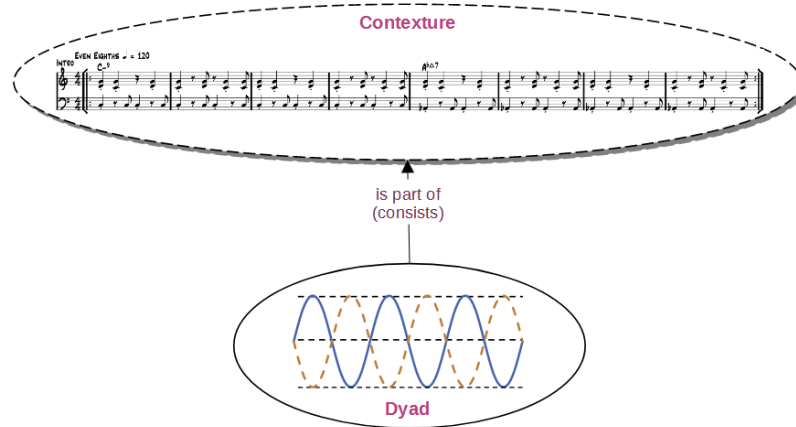

Figure 3: Contexture, represented as a musical score, includes the yinyang dyad. CC-BY-NC-ND David Ing 2023

As an example, a contexture could be a musical selection by a small jazz ensemble. In contrast to a full orchestral score, the lead sheet (also known as a fake sheet) depicted specifies essential elements of meter (time signature), tempo, harmony (chord progressions) and melody. Details such as chord voicings (i.e., the order in which notes are stacked up) often depend on the physicality of the musical device in the hands of the instrumentalist (e.g., a guitar or piano is different for players with longer fingers). Even as the musical selection is identified by a listener, the contexture might be performed by a band with more or fewer skilled musicians. The melody, solos and accompanying parts may be resequenced with minimal notice.

For an individual musician, a *yinyang* dyad might be most clearly illustrated with a wind instrument (i.e., with inhaling and exhaling), or a stringed instrument (i.e., upstroke and downstroke on plucking, or up-bow and down-bow on stroking). Rhythm changes (e.g., 32-bar form in ballads) might be complicated by a compound meter (e.g., 6/8 time might be played as 2-2-2 written as three quarter notes, or 3-3 written as two dotted-quarter notes). The

successful individual band member will be "in the groove" with the ensemble.

The dyad is a whole, and a system. The contexture is also a whole, and a system, of which the dyad is a part. In the musical ensemble described above, an individual musician is commonly identified as a member of a band, even when he or she takes on solo or side projects, some of the time.

4.2.2 Contexture involves multiple rhythmic lines co-responding with each other: A contexture is a "*meshwork* of entangled lines of life, growth and movement". The world we inhabit is a web of life, "not a network of connected points, but a meshwork of interwoven lines" (Ingold, 2011b, p. 64). This is an inversion from (i) a philosophy of stability that elevates changelessness as primary with life as secondary, to (ii) a philosophy of temporality that elevates lines of movement as primary, with the meeting and binding of those lines as connections over time.

There are two major classes of lines: threads, and traces. "A thread is a filament of some kind, which maybe entangled with other threads or suspended between points in three-dimensional space" (Ingold, 2007, p. 41). Some threads are manmade (e.g., a fishing line, a ball of wool). Some threads are linear orders of nature (e.g., roots, stems, shoots). A "trace is any enduring mark left in or on a solid surface by a continuous movement" (Ingold, 2007, p. 43). Some traces are left by human beings (e.g., chalk on a blackboard). Animals leave traces of movements, as paths or tracks. "Threads may be transformed into traces, and traces into threads. It is through the transformation of threads into traces, I argue, that surfaces are brought into being. And conversely, it is through the transformation of traces into threads that surfaces are dissolved" (Ingold, 2011b, p. 52). This anthropological thinking is compatible with the Chinese philosophy of science in *Systems Changes Learning*. "Rather similarly, as we have seen, the energetic lines of traditional Chinese medicine can be at once vein-like threads, coursing through the body, and inked traces on the surface of the page" (Ingold, 2007, p. 117).

A meshwork is a weave in time, a texture in which threads and traces place movements in primacy. In an animic ontogenesis, "beings do not simply

occupy the world, they inhabit it, and in so doing – in threading their own paths through the meshwork – they contribute to its ever-evolving weave" (Ingold, 2011a, p. 71). A meshwork is better described collections of knots created by weavers, rather than joints made by carpenters. Allowing a more temporal view, "the necessity of the knot is not a brittle one that allows for freedom only in the spaces left between, but a supple necessity that admits to movement as both its condition and its consequence" (Ingold, 2015, p. 230).

Living beings, as lines, co-respond over time. For clarity, the label of co-responding for lives carrying on alongside one another is preferred, with the same meaning as defined for correspondence by Tim Ingold. "It is not transverse, cutting across the duration of social life, but longitudinal, going along with it. Correspondence, in this sense, is the process by which beings or things literally answer to one another over time, for example in the exchange of letters or words in conversation, or of gifts, or indeed in holding hands" (Ingold, 2017, p. 14).

In etymology, contexture agglutinates con (as with) and texture, co-responding to a dyad. In an alternative illustration to the musical score depicted in Figure 3 above, texture is shown in Figure 4 below as interwoven lines over time in the meshwork.
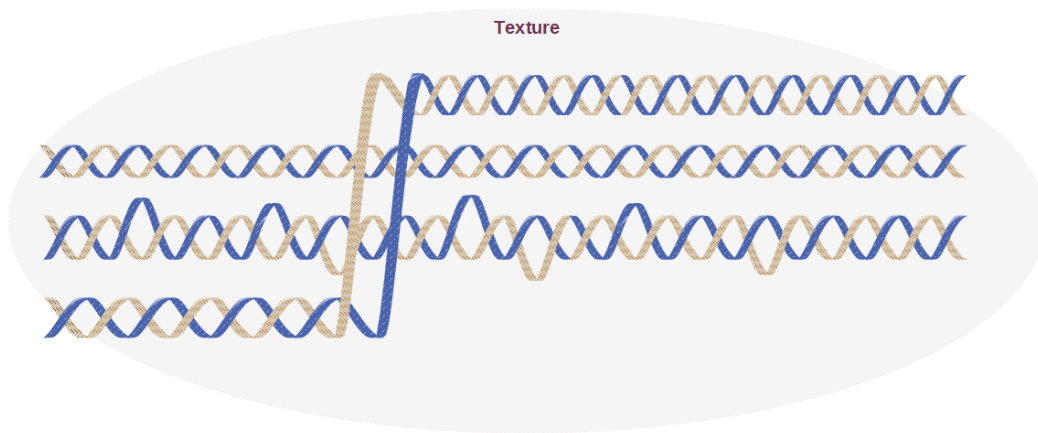
Texture

Figure 4: Texture is a weave of yinyang dyad as lines in a meshwork. CC-BY-NC-ND David Ing 2023

Each line may be seen as a thread and/or trace, composed of lines of interwoven *yin* and *yang*. In one line, *yinyang* appears in a regular rhythm.

Another line shows incidental irregularities, with mostly regular waveforms. A third line show a rhythmic shift to a more frequent periodicity, and crosses over other lines. The lines go along together over time, and the texture is weave with some irregularities.

The texture is a system that has a propensity. Each line is also a system that has a propensity. As "strategy", Chinese philosophy elevates propensity over Western views of causality: "the world is made only from the fact that everything, always, 'leans' towards what is 'ahead' in a certain way – *propendere* – producing its renewal" (Jullien, 2015b, p. 2). Perceiving propensity is therefore a skill, in which each line is more tightly or loosely woven. "This has been called 'contextual' intelligence, one that both branches out and is globalising, since one needs to detect how, at each instant, the configuration is propelled to shift in a certain way, and to do so in accordance with relations and variations that together form, by their effect of coupling, what we call 'situation' – situation being the term we need to think afresh. Henceforth, we won't be content with following the singular causation of an effect, since everything is always a play of correlated factors, worked by its polarities, from which a modification follows (is secreted) and by which the barely emerged tiny possibility will probably become more and more pronounced until it effectively activates itself" (Jullien, 2015b, p. 3). A *yinyang* dyad in the contexture isn't an external observer is the grander system, but an integral part of the larger containing whole.

The influence of a line on the texture as a whole may begin as a shoot or a sprout that grows larger in contribution to the weave over time. In military strategy, the oblique approach involving pre-engagement positioning contrasts with a frontal attack. "Influence is the most successful mode of obliquity – as well as the most difficult to avoid. Indeed, it isn't frontal but its dissemination spreads it in every direction; it operates through every pore and under every angle. It is therefore discreet, not direct: it cannot be confronted because it surrounds us. An influence can't be refuted – or contradicted. Operating upstream, at the level of conditions, it doesn't let its face be shown; diffuse, it doesn't let itself be isolated. This means it is also what we have least hold on" (Jullien, 2015a, p. 51). In the contexture, a conscious approach to intervention relies on influencing rather than persuading.

In a strategic sense, propensity involves three themes: (i) an inherent potentiality at work in configuration (e.g., deploying armies on the battlefield, or brushing an ideogram in calligraphy); (ii) a functional polarity (e.g., sovereign and subjects, or heaven and earth); and (iii) a tendency that develops through alternation (e.g., battles in the course of a war, or a historical situation in the folding of reality as a whole) (Jullien, 1995a, p. 14).

With a greater appreciation of the rhythms that comprise the contexture, the focus can now reorient inwardly to the *yinyang* dyad. Dyadic pairs are challenging for those accustomed to dualism. A more concrete understanding may be gained through a short diversion through Appendix A below, with examples of yinyang dyadic pairs from a variety of sources.

4.2.3 The yinyang dyad may be trapped in a pathology: Most of the time, regular rhythms in systems go unnoticed in the background. Rhythmic shifts, particularly those that persist as discomfort or pain over time, get our attention. Systems generally have some facility for self-healing. However, the texture may get "stuck" in a disfavourable pattern that calls for a nudge, or more drastic intervention.

Classical Chinese Medicine (CCM) has a well-credentialled body of work applying *yinyang* as a theory. CCM is more precise in extending theories from *yinyang* to *wuxing* (i.e., five phases (or five elements) of wood 木, fire 火, earth 土, metal 金, and water 水). With that acknowledgement, the Circle has consciously chosen to focus on *yinyang*. Individuals raised in a Western culture should be cautioned that intricacies in the health sciences require advanced training. "Chinese medicine has had to take many liberties with the Five Phases theory to fit it to actual medical experience. The physiology that grew out of Five Phases theory, for example, is not identical with traditional Chinese physiology" (Kaptchuk, 1983, p. 347). A full understanding would require more intensive study. The concept of *wuxing* "was not a stand-alone notion but one deeply rooted in *Yinyang*, the *Yijing* and the teachings of the *Laozi* and the *Zhuangzi*. [….] It might not be too far from the truth to say that *Wuxing* extracted and thereby extended the implications inherent in *Yinyang* itself, which is nothing more than the

mutually interactive relationships between *yin qi* and *yang qi*" (Lee, 2017c, p. 165).

CCM is internal medicine, focused on prescribing remedies for biological rhythmic shifts that might be the result of natural aging, or shifts in contexture. Six climatic factors are external causes for disease: four that could arise in any season, (i) cold, (ii) dampness, (iii) dryness, and (v) fire; one related to a specific season, (v) summer-heat; and the last related to rapid changes in weather when the body does not have time to adapt, (vi) wind (Maciocia, 2015a, pp. 267-269). For practitioners focused on *Systems Changes Learning*, attention should be drawn to rhythmic shifts that might appear as one of four pathologies, as shown in Figure 5 below.
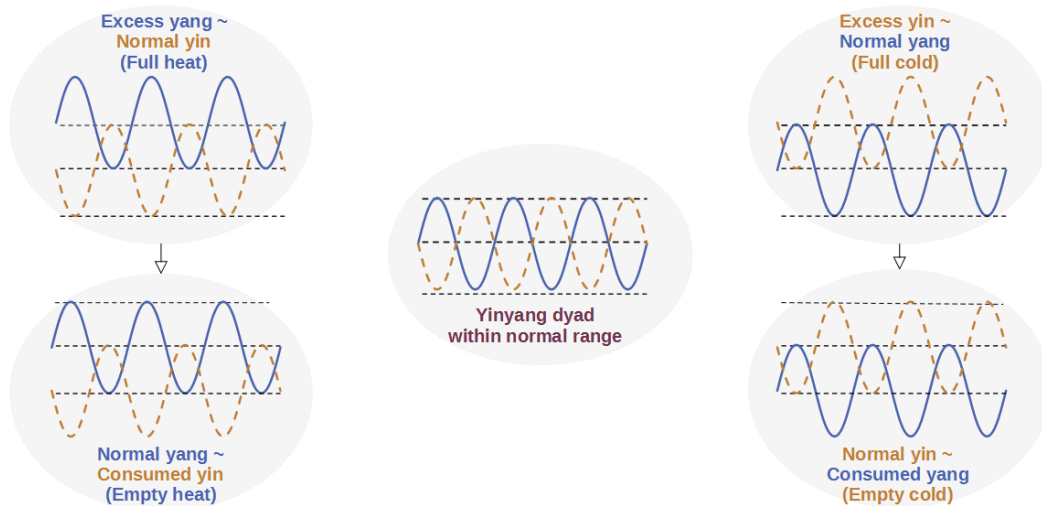

Figure 5: Rhythmic shifts into one of four pathological conditions. CC-BY-NC-ND David Ing 2023

As a reference, horizontal axes have been drawn, so that the dyadic *yinyang* in normal ranges appears as regular waveform. This allows distinctions not just on an imbalance between yin and yang, but also full conditions (i.e., excess as *shi*, meaning solid) as compared to empty conditions (i.e., deficiency) (Maciocia, 2015b, pp. 411–413). Pathologies include:

- excess *yang* ~ normal *yin*, as full heat that injures *yin qi*, leading to empty heat;
- normal *yang* ~ consumed *yin*, as empty heat;

- excess *yin* ~ normal *yang*, as full cold, that obstructs *yang qi*, leading to empty cold; and
- normal *yin* ~ consumed *yang*, as empty cold.

Yang and *yin* mutually consume each other, so the dynamics in a living being occur simultaneously with circadian rhythms with day and night. Conditions and treatments prescribed are: (i) with excess of *yang*, clearing heat; (ii) with deficiency of *yin* (as consumed), nourishing *yin*; (iii) with excess of *yin*, expelling cold; and (iv) with deficiency of *yang* (as consumed), tonifying *yang* (Maciocia, 2015c, pp. 419–423). The complication that pathologies of (i) deficiency of *yang* and (ii) deficiency of *yin* are not mutually exclusive should lead the patient to consult with an experienced CCM practitioner!

The strength of *yin* and *yang* mutually wax and wane (i.e., increase and decrease) over a period of time. In Figure 6 below, the rhythms are drawn with *yin* as the broken brown line, and. *yang* is a solid blue line, in a variety of depictions.
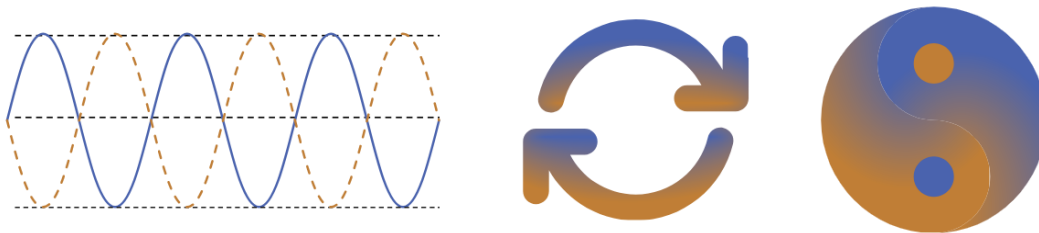

Figure 6: Mutual relations between yin and yang, waxing and waning over a period of time. CC-BY-NC-ND David Ing 2023

- As an oscillating waveform, three horizontal axes drawn as references emphasize the swings from the extremes of (i) maximum *yang* and minimum *yin*, to (ii) maximum *yin* and minimum *yang*. There are points at which *yin* and *yang* are of equal strength, yet the rise and falls of each *qi* are here shown as complements. In a normal healthy being, the waveforms would remain within the upper and lower limits drawn as black dashes.
- As two complementary arcs, the circular alternation of *yang* and *yin* is emphasized. Cycles such as day and night, or the seasons of the year, follow each other continuously.

- The *tàijítú* (太極圖) symbol embraces both monist unity, and dyadic alternation (e.g., between solids and fluids). Within maximum *yang*, there is a dot of *yin*; and within maximum *yin*, there is a dot of *yang*.

The curved shapes in Chinese philosophy depart from the linearity in Western thinking. The predisposition towards changes can be either as continuous or discontinuous. "Chinese organic philosophy was bound to be on the side of continuity. [….] It was a wave world, not a particle world" ([Needham, 1962](#), p. 14). In western science, waves would only become mainstream with the transition from classical physics to quantum mechanics.

In contrast with mainstream Western philosophy that makes the distinction between change and no change, classical Chinese philosophy is based on "the view that the polar contrasting terms in pair of such terms mutually relate to other in a complex, intricate manner" ([Lee, 2017c](#), p. 154). The abstract pair of *yin* (陰) and *yang* (陽) are extrapolated from the empirical *yin qi* (陰氣) that is female, dark and formless, and *yang qi* (陽氣) that is male, light and form. Living beings are a synthesis of *yin* and *yang*, in a contextural universe of *yin* and *yang*. The impetus for change "does not come merely from force from without but also from forces within, namely, that of yin and yang, and the relationship between them" ([Lee, 2017c](#), p. 154).

In the philosophy of science embedded within the classical Chinese tradition, the dyad of *yin* and *yang* are incomplete without contexture. This is in contrast with a philosophy of science descended from the ancient Greek tradition.

> [The] Chinese saw the world as consisting of continuously interacting substances, so their attempts to understand it caused them to be oriented toward the complexities of the entire "field," that is, the context or environment as a whole. The notion that events always occur in a field of forces would have been completely intuitive to the Chinese ([Nisbett, 2003](#), pp. 21–22).

This view of a field is consistent with contexture, and a weave. In explicating systems theory, Western philosophy introduces peril in drawing a strong boundary between a system and its environment. A system is in a field that

includes its environment. The environment should not be seen as a "not-system".

> "The Greeks were focused on, you might even say obsessed by, the concept of contradiction. If one proposition was seen to be in a contradictory relation with another, then one of the propositions had to be rejected. The principle of noncontradiction lies at the base of propositional logic. [....] Notice that logical analysis is a kind of continuation of the Greek tendency to decontextualize. Logic is applied by stripping away the meaning of statements and leaving only their formal structure intact. This makes it easier to see whether an argument is valid or not. Of course, as modern East Asians are fond of pointing out, that sort of decontextualization is not without its dangers" (Nisbett, 2003, pp. 25–26).

Western science, in the pursuit of *episteme*, pursues universals through decontextualization. *Techne* and *phronesis* are, however, not context-free (Ing, 2013).

Discerning propensities in a pathology within a contexture may be likened to figuring out the way to successfully become a surfer, in contrast to becoming a water skier. Surfing occurs within a contexture of waves created by winds and the rotation of the earth. A time and location for when "surf's up" isn't determined by the surfer. Paddling out, stomach-down on the surfboard, the surfer stages with others in a lineup. Amongst other in the lineup, the surfer closest to the breaking wave negotiates priority. Reading the waves, the surfer then judges whether the wave is breaking right or left, turns, and catches the wave. From the prone position, the surfer pops up with a jump for a stance balanced on two legs, and draws the line to ride the wave down. Ending the ride is a choice between ending with a beachbreak, or performing a cut back for the next wave. Breaking the pathology of wiping out combines mastering the art of reading and anticipating waves, and improving personal technique. Water skiing follows a more causal pattern, where human beings are not reliant on wind conditions, instead organizing a motorboat to tow the skier. There are skills that might be transferred from one sport to the other, but the art and science have different underlying philosophies.

The intellectual shift to contextural dyadic thinking based in propensity, from a Western analytical tradition of causality, is an adjustment in worldview not only in science but in philosophy. Within Western philosophy, there is some recognition of process philosophies. However, "one should not judge a cat show by the standards of a dog show and conclude that a cat is a sub-standard dog, or indeed, not a dog at all" (Lee, 2017a, p. 4). The contexture matters, and "the oppositional pair created is not a dualism but a dyadism" (Lee, 2017b, p. 224).

Towards developing methods that learners might find more straightforward, section 4.3 below puts *theoria* in the background to focus on *poiesis*.

4.3 Methods-weaving, as making, is learning for co-relating shifts (Poiesis – Making)

Towards educating learners on methods for *Systems Changes Learning*, we aspire towards developing a generative pattern language in the tradition of Christopher Alexander, extended with systems thinking by contemporaries and legacies in the 1970s, continuing with communities such as the Hillside Group (Ing, 2018a). Towards a blend of art and science, "because usually several patterns can solve a given problem, and any pattern requires a particular context to be effective, the process is generally not linear but is a sort of constraint-relaxation process" (Gabriel, 1996, pp. 46–47). After 3 years in a 10-year journey, we are not yet at the state where we have a body of patterns that "useful, usable and used" (Appleton, 1998). The pattern language will eventually be generated through experience in praxis.

The *poiesis* for the Circle began in ensuring that our learning was directed towards the right questions, before resources were committed into finding the right answers. Science sometimes falls into the pitfall of a *Type 3 Error* of tricking ourselves: making the unintentional error or solving the wrong problem precisely (through ignorance, faulty education, or unreflective practice). In the 21st century, greater concern is now placed on the *Type 4 Error* of tricking others: an intentional error of solving the wrong problems (through malice, ideology, overzealousness, self-righteousness, or wrongdoing (Mitroff & Silvers, 2010). "If they can get you asking the wrong questions, they don't have to worry about answers" (Pynchon, 1973).

Based on multiparadigm inquiry, practitioners can be guided through processes aligned to five questions.

4.3.1 Co-relating rhythmic shifts consists of 5 subprocesses of learning: Supporting the praxis described in section 4.1 above, an individual or group typically comes to Systems Changes Learning with an issue or wicked mess. If a direct line between problem and solution is visible, the path is straightforward. However, if there are multiple systems at play, untangling the threads requires some effort. The process of co-relating rhythmic shifts can be broken down into five subprocesses, shown in Figure 7 **Figure 7**below as aggregation-particularization relations.
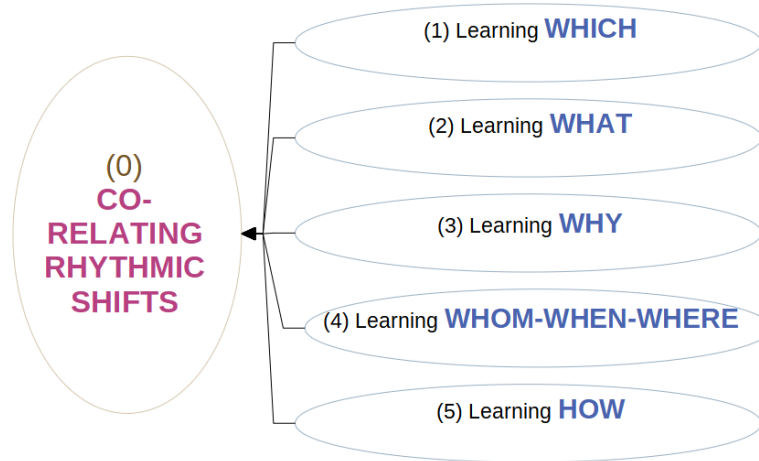

Figure 7: Co-relating rhythmic shifts consists of five learning subprocesses. CC-BY-NC-ND David Ing 2023

The five subprocesses can each be associated with a philosophical movement.
- (1) *Learning WHICH* relates to *phenomenology*, whereby we perceive and experience everyday encounters in our lives, and deal with obstacles and opportunities that show up for us.
- (2) *Learning WHAT* relates to (i) *ontology* in a sense of informatics and computer science, whereby, in a domain, we give names to processes, objects and their relations; and (ii) *ontogenesis* in a sense

of anthropology, whereby we appreciate living systems in lines of becoming alongside others in the world.

- (3) *Learning WHY* relates to *epistemology*, whereby we are critical about how knowing what we claim to know, acknowledging uncertainty, doubts, and limits to cognitive capacities.
- (4) *Learning WHOM-WHEN-WHERE* relates to *phronesis*, whereby we apply practical wisdom on values and ethics, taking into consideration the human and non-human beings involved and/or impacted by our actions.
- (5) *Learning HOW* relates to *techne*, whereby we develop and employ skills as arts, crafts, and applied science instrumentally towards an end.

An approach with interplay amongst multiple philosophies is multiparadigm inquiry (Lewis & Kelemen, 2002). The *Systems Changes Learning Circle* progresses action learning through theoretical instrumental action amongst the scholarly subgroup, alongside the pragmatic communicative action amongst the field practice subgroup (Ulrich, 1988). The multiparadigm inquiry informs "knowing from within", so that subconscious rhythmic shifts might be surfaced for collective reflection.

4.3.2 The five subprocesses of co-relating rhythmic shifts are more precise as questions: To aid with more clarity on weaving methods into praxis (i.e., Figure 7 above), the five subprocesses can be extended into questions, shown in Figure 8 below.
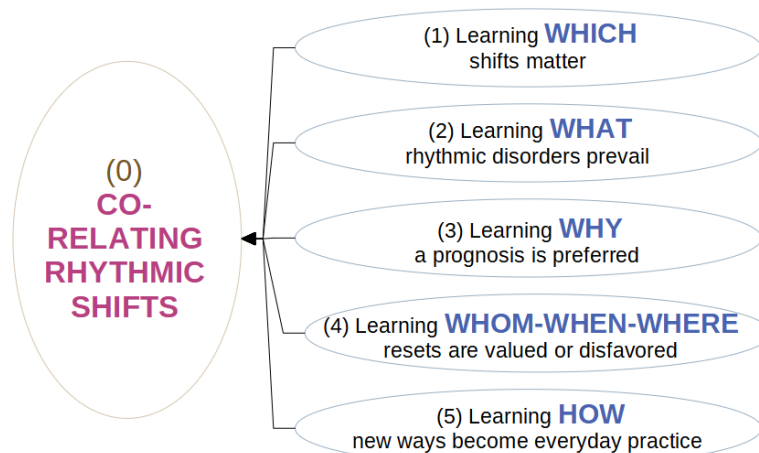
Figure 8: Five learning subprocesses extended into questions. CC-BY-NC-ND David Ing 2023

While praxis aspires to be systemic and wholistic, poiesis for Systems Changes Learning aims to be more systematic and concrete. The five subprocesses in Figure 8 above don't map neatly into the praxis process hub with four spokes in Figure 2 above. For concreteness, the example rhythmic shifts in human movement in a world dealing with the responses to the Covid-19 pandemic are resurfaced, from the beginning of Section 4 4. Learning for co-relating rhythmic shifts reorders fields spatially and temporallyabove.

- (1) *WHICH* shifts matter? If we're living in a world where everything is changing, in a process philosophy, we should identify the primary system of interest in which adapting and/or learning is targeted. In addition, co-related systems of influence with strong or weak ties should be recognized.
    - o In the pandemic, suppose our system of interest is a family unit (e.g., two parents, two children). Potential shifts of systems of influence could be from a school (e.g., from in-person attendance to online education), a workplace (e.g., from centralized office to work-from-home), and/or family support (e.g., from daycare to grandparents nearby).
- (2) *WHAT* rhythmic disorders prevail? Amongst the many changes, some rhythmic shifts are more troublesome than others. Symptoms and effects might be interconnected into a mess (problematique).

- o In the pandemic, rhythmic disorders in the system of interest could be in physical health (e.g., reduced exercise, sleeplessness), mental stress (e.g., depression, loneliness), and/or work productivity (e.g., missing deadlines, improved efficiency).

- (3) *WHY* a prognosis is preferred? Prescribing remedies, given symptoms, always comes with uncertainties. There are quick fixes that might not persist, as well as more involved interventions that are not without side effects. An action learning cycle recognizes judgements made at a point in time with the available information. There's always a balance between continuing investigation for deeper insight, and an educated guess on the best path to resolution for the system of interest.
  - o In the pandemic, a prognosis might be a conscious rhythmic shift in lifestyle (e.g., switching from team sports to individual outdoor workouts), habitation (e.g., from living alone to moving back in with family), or career (e.g., quitting the job, and taking a course in a different field).

- (4) *WHOM-WHEN-WHERE* resets are valued or disfavoured? Conscious rhythmic shifts impact the system of interest directly, and may have ripple effects in the systems of influence. A contextural approach concurs with the practical wisdom of a particular strategy or program that might be "right" in the ideal, but "wrong" in timing.
  - o In the pandemic (and at any time), a major decision made for a family as whole will have upsides and downsides for individual family members, e.g., more personal exercise scheduling could lead to less family time in the evening with children, or uprooting the family from a big city to a rural community impacts schooling and careers.

- (5) *HOW* new ways become everyday practice? Reacting to a rhythmic shift by adapting situationally reflects some wisdom in distinguishing exceptional circumstances from a new normal. Words are not enough to demonstrate a change in everyday practice. Firstly, we might reserve "the term decision to mean an irrevocable allocation of resources" (Kusnic & Owen, 1999, p. 227). Then "without a concomitant resource commitment", the so-called decision becomes

"an empty statement of desire". In groups, a leader can generate organizational incoherence through "communicate-and-hope" declarations that led to uncoordinated and self-defeating behavior ([Haeckel, 1999](#)).

- o In the pandemic, shifts in everyday practice can be observed in the decisions and actions of optimists and pessimists. Some restaurant owners have relied on loan guarantees from governments to bridge through hard times, while other have invested in catering facilities as food delivery has become more commonplace.

The five questions might be kept in mind by facilitators to ensure completeness, or by individuals as a checklist on thoroughness in reflecting.

The primary praxis for *Knowing from Within* through the four-spoke subprocess should be the primary navigation through *Systems Changes Learning*. Working through the five questions might be sequentially progressive, although backtracking should be expected as groups come to know what the group didn't know before.

A more completely engineered procedure is described in section 4.3.3 below.

4.3.3 The five processes of learning can be sequenced to yield five artifacts: Group deliberating through complicated understandings of the multitude of rhythmic shifts can document collective learning through the generation of artifacts that can be shared with others. A fuller explanation of the foundational methodology is left to section 5.3 5.3 Methods-composing, as making, is learning for articulating shifts (Poiesis – Making)below. The preceding diagrams are extended with artifacts produced in Figure 9 below.
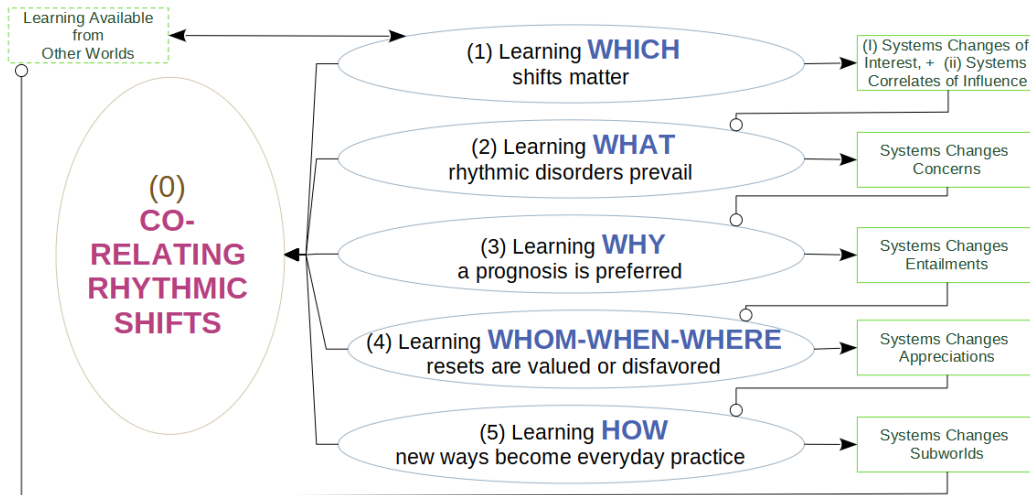
Figure 9: The five learning subprocess can led to five artifacts as work products. CC-BY-NC-ND David Ing 2022

A systematic approach to a Systems Changes Learning initiative can described as a linear progression.

- (1) *Learning WHICH* yields (i) system of interest and (ii) correlates of influence: Obtaining concurrence within an informed group on the rhythmic shifts of a specified system that might know from within generally involves some deliberation. The identifying pertinent rhythmic shifts in co-related systems of influence raises questions as to whether involvements between systems are mediated, bilateral or multi-lateral. Diagrams and written proceedings of collective reasoning foster shared understanding, and provide a pathway for parties not immersed in intensive sensemaking to come up the learning curve.

- (2) *Learning WHAT* yields systems changes concerns: Winnowing the multitude of rhythmic shifts enables de-emphasizing features of less importance, to focus on matters of greatest concern. "Done well, separation of concerns can provide many … benefits, including reduced complexity, improved reusability, and simpler evolution" (Tarr et al., 1999, p. 109). Differentiating symptoms between the spurious and significant could lead to a call for wider participation, or a divide-and-conquer approach.

- (3) *Learning WHY* yields systems changes entailments: "'Entails' can be a synonym for 'could lead to'. Entailment and causality are linked concepts, the difference being that causality is 'what does happen' and entailment refers to 'what COULD happen'. Nothing can happen that isn't entailed (Rosen, 2016). In hypothesizing conditions that might lead to a rhythmic shift, either as a disease that could be corrected or a permanent restructuring of contexture, we trace backwards aiming to reconstruct sequences of events. Replication of the entailments might or might not lead to exactly the same outcome again. In cases where the current situation seems to be irreversible, investigations of entailments beyond the rudimentary may not improve the prescribed action.
- (4) *Learning WHOM-WHEN-WHERE* yields systems changes appreciations: Is the cure worse than the disease? In a living system, for whom would a conscious intervention make the situation better, and for whom would it be worse? They are the judgments of value and judgments of reality in systems of appreciations (Vickers, 1963, 2010). These types of questions cross over from the scientific, towards the ethical, moral, and aesthetic.
- (5) *Learning HOW* yields systems changes subworlds: Presuming that we might looking into a system of multiple wholes, an intervention may not be practical all at once. This leads to planning for staged or sequenced activities, so that the world is partitioned into subworlds. Further, in social systems where human will is recognized, denial or resistance to interventions may lead to more fractured subworlds.

Practically, all of the artifacts could be templated at the initiation of an initiative, with updates added as more information is gathered. The value of five questions, with artifacts oriented differently, aims to deter a temptation to jump to "how". A non-systemic result could see a group reaching a *Type 3 Error* of solving the wrong problem precisely, or misguided by a facilitator guiding towards a *Type 4 Error* (Mitroff & Silvers, 2010).

Summarizing Section 4, *Systems Changes Learning* provides a way of viewing rhythmic shifts in a weave of *praxis*, *theoria* and *poiesis* that may resonate more readily with practitioners accustomed to working with living systems than mechanical systems. The aim is more for an intuitive

appreciation of this perspective, rather than a requirement to follow a cookbook or fill in a canvas.

Section 5 below follows the third row of Table 1 above. The aim is to equip mentors who might "teach the teachers", that ensure coherency with the deeper scholarly foundations.

5. Learning for articulating shifts provides mentors with a philosophy of science

For mentors guiding practitioners interested in deepening systems thinking facility, *Systems Changes Learning* is itself a rhythmic shift. An inspiration on our trajectory was the 1960s-1970s era at U.C. Berkeley, when (i) Christopher Alexander formed an institute on environmental structure to bring pattern language into the built environment, (ii) Horst Rittel distinguished a new theory of planning with wicked problems, enabled Issues-Based Information Systems as tools for decision-making, and (iii) C. West Churchman drew together an open systems approach through the design of inquiring systems where multiple modes of thinking could be combined to sweep in new knowledge (Ing, 2017). On reviewing such an ambition at the 2014 *Conference on Pattern Languages of Programs* (Ing, 2014), Richard Gabriel advised that such an initiative would not be successful through meeting at international conferences. A small group meeting locally and frequently would be more likely to make progress. This led to meetings reviewing that vision in November 2018 (Ing, 2018b). The core members of the Circle committed to participating on an espoused 10-year horizon in January 2019 (Ing, 2019b).

Systems Changes Learning may be rising as a school of thought alongside many other great traditions. Mentors to the community will be involved in (i) action-guiding; (ii) theory-building, and (iii) methods-composing.

5.1 Action guiding, as doing, is learning for articulating shifts (Praxis – Doing)

Mentors should be well-experienced in guiding action learning amongst practitioners. The primary audience for *Systems Changes Learning* is changemakers acquainted with, but not immersed in, systems thinking. A deductive approach that lays out the variety of traditions to wend through definitions and distinctions can be intimidating to novices! An approach that reduces cognitive overload starts from the immediate concerns of novices drawn to systems thinking, and then increases precision on terms and concepts along a shallow gradient (Ing, 2011).

Drawing attention to rhythmic shifts is a device to lead novices to open up their perspectives towards reframing their concerns. In a group retreat scheduled over 4 to 5 days, the extended time better allows the guided evolution through a *Banathy Conversation* that would begin with the preparation of input papers, and close out with published proceedings (Dyer et al., 2015). In the more practical business setting, mentors are likely to begin with a workshop that establishes a beachhead, and continues refinement as the organization requires.

The emphasis on rhythmic shifts is not inconsistent with traditions where conversations on living systems are common. The *Systems Changes Learning Circle* favours the schools of thought in General Systems Theory, Learning Systems, and Soft and Critical Systems. Other schools of thought are acknowledged, such as Early Cybernetics, System Dynamics, Later Cybernetics, and Complexity Theory (Ramage & Shipp, 2020). Rhythmic shifts can add a dimension to systems practice nurtured in the university classroom and applied in the field (Ison, 2017).

The Circle has been sharing informally with practitioners as the collective point-of-view has developed, and distinctions clarified. After 4 years in incubation, the Circle is now transitioning towards more formalizing and co-learning at large.

5.2 Theory-building, as thinking, is learning for articulating shifts (Theoria – Thinking)

Mentors should have a strong intuition on the theories underlying with *Systems Changes Learning*, while accepting that much of the philosophical underpinnings are best left to scholarly members.

Our approach co-relates to practices applying post-colonial science, learning from medical practitioners in Taiwan who consult with patients in a blend of techniques from Classical Chinese Medicine and procedures and devices common in Western biomedicine.

> … correlativity within (at least some) [Classical Chinese Medicine] practices refracts a pattern of practice that *hybridizes without purifying*; gives priority to *situated* knowing; enacts a version of the body that is *non-reductive* even in principle; *weaves patterns* between what Chinese philosophical tradition calls 'the ten thousand things' (*wàn wù*, 萬物); and, finally, adopts a dynamic approach to *propensities* at work in specific situations (Lin & Law, 2014, p. 804).

The description of a visit by a patient with a Chinese Medicine practitioner follows procedures standard to the profession: interviewing on symptoms while taking the pulse with three fingers, and looking under the tongue. Measure blood pressure with a haemadynamometer and reviewing blood test results come from Western biomedicine. The combined protocols are a "situated reification" of medical practice in hybridity.

Acknowledging that human beings live in social systems where will is exhibited, *Systems Changes Learning* aims to be less anthropocentric. Humans live in a world of movement, and can have an optimism towards developing collectively n positive ways. Being is recognized philosophically as ontological, whereas moving and developing may be better appreciated in a turn towards *becoming* as ontogenetic.

> Let our concern be not with philosophies but with generations of being. … [With] with multiple ontogenies, every being or thing is open, subject to growth and movement, issuing forth along its own particular path within a world of nevertheless inexhaustible differentiation. Nothing in

this world is settled, once and for all. In short, ontogenesis allows us to reconcile singularity and multiplicity, agency and patency, within one world (Ingold, 2018, p. 359).

Human beings are entangled in a world alongside other living systems who may also be dealing with problematic rhythmic shifts.

With foundational philosophy in place after three years of research, the theorizing through *Systems Changes Learning* may continue to progress alongside field experiences.

5.3 Methods-composing, as making, is learning for articulating shifts (Poiesis – Making)

Mentors will be increasing involved with shepherding the documenting of processes and techniques that are proven as successful in practice. Although the *Systems Changes Learning Circle*, as described the dynamic-stability model, was initiated as (i) an invention mode with dynamic product change and dynamic process change, the aspiration on the longer horizon sees a phase of (v) mass customization, where a dynamic product can be delivered through a static process (Boynton et al., 1993; Victor & Boynton, 1998). The phases of (ii) mass production and (iii) continuous improvement are acknowledged as requisite along the journey.

The variety of contextures in rhythmic changes leads us to think ahead to situated methods. An approach that captured intellectual capital from consulting engagements at IBM was centered on (i) work product descriptions; (ii) work breakdown structures; (iii) roles describing sets of skills; and (iv) techniques guiding the work, in a componentized structure (Cameron, 2002). While much of this knowledge was lost inside of IBM due to organizational changes in that decade, the frameworks were externalized as open source projects with the Eclipse Foundation (Balduino, 2007; Haumer, 2007). While the frameworks are valuable experiences in which millions of dollars were invested, the enabling technological platforms are seen as dated.

An enduring platform for pattern languages, since their adoption into the software development community, has been wiki (Cunningham & Mehaffy,

[2013](#)). The federated wiki community, first initiated in 2012 ([Finley, 2012](#)), continues to develop the technology platform and extend functionality for diligent authors.

The sophistication of a componentized knowledge base of collective experiences will continue to be a work-in-progress, as the Circle maintains a trail of artifacts for harvesting and reuse.

6. Conclusions: The journey sees a rhythmic shift from thinking, towards doing and making

In 2023, this journal article could be seen as rhythmic surge in *yang*, particularly in the material artifacts associated with thinking, as produced the scholarly team of the *Systems Change Learning Circle*. In dyadic phases, as *yang* wanes, *yin* waxes. The emphasis on *yin* though the next few years should see more doing and making.

Promoting doing, the field team expects to be facilitating sessions and workshops whereby novices may be introduced to the body of work, so that they might learn about the *Systems Changes Learning* approach, and situationally place their own contextural appreciations for their circumstances. For design, *Systems Changes Learning* has been proposed as a lens through which designing might become more humble ([Khan, 2022](#)). Towards having a shallower learning curve into the body of work, the field team is convening a series of "Open Agenda" meetings for small business members of the *Centre for Social Innovation*. Questions that these founders and owners bring about strategy and organizational development follow an unstructured conversation. Field team members with the process hub-and-four-spokes in the back of their minds co-learn in dialogue inductively, rather than introducing models and frameworks up front.

The *making* of formalizing methods continues slowly as a decoupled activity. Concurrent learning in sister pattern language and federated wiki groups presents opportunity for non-linear wayfaring.

The *Systems Changes Learning Circle* was founded on a premise of cellular form organization ([Miles et al., 1997](#)). A stable core group represents the first cell. Open access platforms in collaboration with the Open Learning Commons (https://openlearning.cc) and the Digital Life Collective (https://diglife.com) have proven to be durable repositories whereby interested individuals can readily join, online.

Appendix A

Contextual-dyadic thinking emphasizes that we can appreciate *yinyang* only with the *larger contexture* in which it is contained.

> The qualities only make sense when one specifies a certain context. The fact that anything is simultaneously yin and yang mirrors the fact that things are always implicated in multiple relations at once. Moreover, which relation is in view depends on the particular purposes and priorities of the viewer. [….]
> Yin and yang contest each other in a temporal framework and in multiple ways ([Wang, 2013](#), p. 16).

Towards a shallower gradient of learning, let's try approaching *yinyang* from the more concrete descriptions in application of Classical Chinese Medicine, on the way to the more abstract generalities in philosophy.

In the context of a patient examination, a CCM practitioner looks for clinical manifestations of apparent excess or deficiency in the relative strength of pulses of yang and yin shown in Table A1 below ([Maciocia, 2015d](#), p. 13).

Table A1: Apparent excess of yang or of yin, as clinical manifestations

Apparent Excess of Yang	*Apparent Excess of Yin*
Acute disease	Chronic disease
Rapid onset	General onset
Rapid pathological changes	Lingering disease
Heat	Cold
Restlessness, insomnia	Sleepiness, listlessness
Throws off bedclothes	Likes to be covered
Lies lie stretched out	Likes to curl up
Hot limbs and body	Cold limbs and body
Red face	Pale face
Loud voice, talks a lot	Weak voice, dislikes talking
Coarse breathing	Shallow, weak breathing
Thirst	No thirst
Scanty-dark urination	Profuse-pale urination
Constipation	Loose stools
Red tongue with yellow coating	Pale tongue
Full pulse	Empty pulse

The symptoms in Table A1 above are fundamental, yet incomplete, since *yang* and *yin* are relative complements. An apparent excess of *yang* could be described as (i) a preponderance of *yang*, with *yin* at a normal level (i.e., full heat), or (ii) *yang* at a normal level with weakness in *yin* (i.e., empty heat). These are shown in the four pathological conditions in Figure 5 above.

Guiding clinical practice, *yang* and *yin* have opposing characteristics with basic qualities in Table A2 below ([Maciocia, 2015d](#), p. 11).

Table A2: Yang and Yin in opposition, as qualities in clinical practice

Yang	*Yin*
Fire	Water
Heat	Cold
Restless	Quiet
Dry	Wet
Hard	Soft
Excitement	Inhibition
Rapidity	Slowness
Transformation / change	Conservation / storage / sustainment

These interrelationships can be mapped onto organs within the body, as subsystems in dynamic interaction.

In a more abstract view, the *yin-yang* phenomenon represents two opposite cyclical phases is the density of matter listed in Table A3 below (Maciocia, 2015d, p. 7).

Table A3: Yang and Yin as opposite cyclical stages in density of matter

Yang	Yin
Immaterial	Material
Produces energy	Produces form
Generates	Grows
Non-substantial	Substantial
Energy	Matter
Expansion	Contraction
Rising	Descending
Above	Below

In the contexture of matter, the cycle towards *yang* disperses or evaporates; the cycle towards *yin* condenses or agglomerates.

Most generally, Chinese philosophy follows from the primordial dyad of a hill, with (i) *yang* as the sunny side and (ii) *yin* as the shady side. Early peasants saw correlations in the alternation of (i) day with activity, and (ii) night with rest, as outlined in Table A4 below (Maciocia, 2015d, p. 5).

Table A4: Yang and Yin as two phases of a cyclical movement

Yang	Yin
Light	Darkness
Sun	Moon
Brightness	Shade
Activity	Rest
Heaven	Earth
Round	Flat
Time	Space
East	West
South	North
Left	Right

On Chinese maps, the sun rose to the east and set to the west. The south cardinal point was at the top of the page, as the direction from which winds originated.

In *Hauinanzi* (*Huai nan tzu*) circa 139 B.C., the Taoism is built on *qi* (*ch'i*) as "opposition between the amorphous as spatially extended and as temporarily enduring" ([A. C. Graham, 1986](), pp. 32–33). The cosmos is described in parallel pairs, from the simplest yet most comprehensive pattern, towards corelative thinking in Chinese culture. In Table A5 below, nominal concepts are in lower case, and verbal concepts in capitals.

Table A5: A chain of binary oppositions, in the Tao as the "Way"

	Qi	
Clear and subtle	Heavy and muddy
HEAVEN	EARTH
YANG	YIN
Hot	Cold
FIRE	WATER
SUN	MOON
Round	Square
Illuminates	Retreats to dark
Expels	Holds in
Does to	Is transformed by
Scatters	Congeals
RAIN AND DEW	FROST AND SNOW
FURRED AND FEATHERED	SHELLED AND SCALY
Flies or runs	Hibernates or hides
Goes up	Goes down

This correlative thinking can be applied analogically and analytically with the pattern of pairs, but incomplete escalations seeking explanation higher in the chain, i.e., in the rule or ancestor of the lower.

The complexity and multiplicity of yinyang through can be generalized as relationships in 6 forms:

1) *Maodun* 矛盾: Contradiction and opposition. [⋯.] Any given two sides are connected and related, but they are also opposed in some way, like light and dark, male and female, and forceful and yielding. It is the tension

and difference between the two sides that allows for the dynamic energy that comes through their interactions. [….]

2) *Xiangyi* 相依: Interdependence. One side of the opposition cannot exist without the other. [⋯.] According to yinyang thinking, though, the interdependence of opposites does not simply refer to the relativity of our concepts but also to how things themselves exist, grow, and function. One way that this interdependence appears most clearly is through the alternation of yin and yang. [….]

3) *Huhan*互容: Mutual inclusion. Interdependence is linked closely to mutual inclusion. If yin depends on yang, then yang is always implicated in yin; which is to say, yin cannot be adequately characterized without also taking account of yang. The same is true for yang – it necessarily involves yin. [….]

4) *Jiaogan* 交感 : Interaction or resonance. Each element influences and shapes the other. If yin and yang are interdependent and mutually inclusive, then a change in one will necessarily produce a change in the other. Thus, as yang ebbs in the autumn, yin strengthens, and as yin declines in the spring, yang grows. [….]

5) *Hubu* 互補: Complementary or mutual support. Each side supplies what the other lacks. Given that yin and yang are different but interdependent, properly dealing with a situation often requires supplementing one with the other, which is a way of achieving the appropriate balance between the two. […]

6) *Zhuanhua* 轉化: Change and transformation. One side becomes the other in an endless cycle. Yinyang thought is fundamentally dynamic and centers on change. [⋯.] Reversal (*fan* 反) is a constant theme in Chinese thought, especially in the Daodejing. It invokes the image of a circle, or more precisely, a spiral movement that forever continues in a ring formation. (Wang, 2013, pp. 216–219).

These six forms present *yinyang* as *dyadic*. In more completeness, the philosophy is dyadic-contextual, where *yinyang* should be appreciated in the weave of the containing world.

Acknowledgements

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