Pacing Changes,

Appreciating Approaches to Systems and Designing

David Ing

http://coevolving.com

RSD14: Relating Systems Thinking and Design

Toronto, Ontario

October, 2025



Image CC-BY Mike Cassano (2009) *Most Interesting Pothole*

David Ing, 2025

Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

What's the difference between (i) *a change in a system*, and (ii) *systems changes*?



AytwitEngineering (2020)
Biggest Boulder I've Ever Moved



NOAA B Roll (2016) NOAA Tsunami Animation

David Ing, 2025

Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

B. Method (page 1 of 3) …

Are the systems of interest approached via (i) Human Social Systems Theory, or (ii) General Systems Theory?

Systems	Stakeholders: Unitary	Stakeholders: Pluralist	Stakeholders: Coercive
Complex	• Complexity Theory • Network Analysis	• Multi-method-ology • Critical Systems Practice	• Critical Systems Heuristics • Total Systems Intervention
Complicated	• System Dynamics • Viable Systems Model • Org Cybernetics	• Soft Systems Metho-dology	• Emanci-patory Systems Approaches
Simple	• Operations Research • Systems Engineering • Systems Analysis	• Interactive Planning • Strategic Assumption Surfacing and Testing	• Social Systems Design • Social Cybernetics

Jackson, Michael C. 2019. *Critical Systems Thinking and the Management of Complexity*. John Wiley & Sons.

9. **Transcendental**: unknowables
8. **Social Orgs**: symbolic images
7. **Humans**: self-consciousness
6. **Animals**: mobility, teleology
5. **Plants**: genetic-social
4. **Cells**: self-maintaining life
3. **Thermostats**: control mechanism
2. **Clockworks**: predetermined motion
1. **Frameworks**: static structures

Boulding, Kenneth E. 1956. "General Systems Theory -- The Skeleton of Science." *Management Science* 2 (3): 197–208. https://doi.org/10.1287/mnsc.2.3.197.

David Ing, 2025

B. Method (page 2 of 3) …

Pluralist pragmatism of William James → Stephen C. Pepper → Emery + Trist → Michael C. Jackson → Critical Systems Practice

	Dispersive manner for organizing evidence	***Integrative*** manner for organizing evidence
Analytic mode of reasoning	**Formism** *Root metaphor*: **Similarity**, as recurrence or recognizable features	**Mechanism** *Root metaphor*: **Machine**, where exerting force or energy produces predictable outcomes
Synthetic mode of reasoning	**Contextualism** *Root metaphor*: **Situation**, as a historic event in its living actuality	**Organicism** *Root metaphor*: **Constructive Development**, with orderliness of changes from stage to stage

	Dispersive manner for organizing evidence	***Integrative*** manner for organizing evidence
Analytic mode of reasoning	**Formism** **Analytic**: parts in relations are presumed; each whole is inferred. **Dispersive**: unpredictability (non-determinism) is presumed; determinate order is denied.	**Mechanism** **Analytic**: parts in relations are presumed; each whole is inferred. **Integrative**: determinate order is presumed; unpredictability (non-determinism) is denied.
Synthetic mode of reasoning	**Contextualism** **Synthetic**: wholes are presumed; parts in relations are inferred. **Dispersive**: unpredictability (non-determinism) is presumed; determinate order is denied.	**Organicism** **Synthetic**: wholes are presumed; parts in relations are inferred. **Integrative**: determinate order is presumed; unpredictability (non-determinism) is denied.

David Ing, 2025

A new World Hypothesis is proposed as (Con)texturalism-Dyadicism, embracing both dispersive and integrative manners

	Dispersive manner for organizing evidence	***Integrative*** manner for organizing evidence
Synthetic mode of reasoning	**Contextualism**: *Root metaphor*: **Situation**, as a historic event in its living actuality *Theory of truth*: Operationalism, via qualitative confirmation of solving a specific problem *Categories*: Strands, texture, quality, novelty *Nature of time*: Qualitative duration, event relative to a specious present	**Organicism** *Root metaphor*: **Constructive Development**, with orderliness of changes from stage to stage *Theory of truth*: Coherence, where fragments cohere with their nexus, free of contradiction *Categories*: Progression (steps), final outcome (ideal) *Nature of time*: Directional arrow, successive integrations
	(Con)texturalism-Dyadicism: *Root metaphor*: **YinQi ⇌ YangQi dancing through [eight] seasons**, as ((YinQi) ∝ 1/(YangQi)) wayfaring in unfolding wanwu [dissipating ⇌ concentrating] textures *Theory of truth*: Entailment, traceability back through history, with anticipated outcomes indetermined *Categories*: Rhythmic shifts in (con)textures, situational propensity, dyadic diachrony *Nature of time*: Kairotic, with propitious periods and inopportune periods	
	Dispersive + integrative manner for organizing evidence	

Interpret the double harpoon as reversibility in chemistry: (YinQi ⇌ YangQi) == (YinQi is complementary with YangQi).

Interpret the math symbol ∝ not as alpha: (YinQi ∝ 1/(YangQi)) == (YinQi is inversely proportional with YangQi).

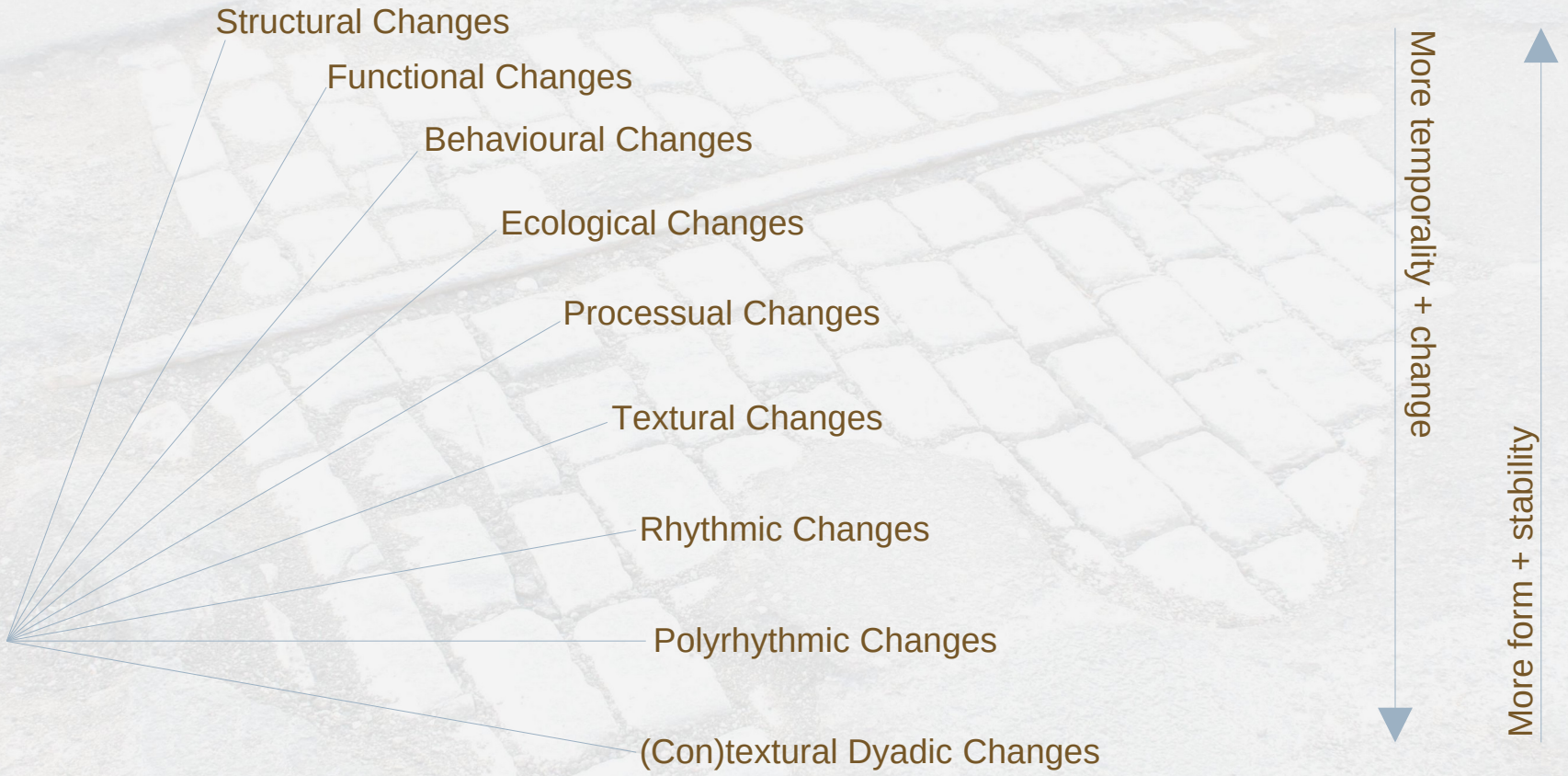
David Ing, 2025

Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

A list of 9 approaches to systems changes, neither exhaustive nor mutually exclusive, ranges concerns from stability to temporality



David Ing, 2025

Structural Changes involve (re)designing part-part relations, as reforming (i.e. rearranging in space)

Structural Changes

- Functional Changes
- Behavioural Changes
- Ecological Changes
- Processual Changes
- Textural Changes
- Rhythmic Changes
- Polyrhythmic Changes
- (Con)textural Dyadic Changes



Eversource (2023) Replacing a Transmission Structure Time Lapse

David Ing, 2025

Functional Changes involve (re)designing part-whole relations, as transforming (i.e. contribution of a part to the whole)

Structural Changes

Functional Changes

Behavioural Changes

Ecological Changes

Processual Changes

Textural Changes

Rhythmic Changes

Polyrhythmic Changes

(Con)textural Dyadic Changes



WatchStats (2020) Evolution of Phones 1876-2020

David Ing, 2025

Behavioural Changes involve (re)designing interactions of a whole to events (reactions as deterministic, responses as coproducing, acts as self-determined autonomous)

- Structural Changes
- Functional Changes
- **Behavioural Changes**
- Ecological Changes
- Processual Changes
- Textural Changes
- Rhythmic Changes
- Polyrhythmic Changes
- (Con)textural Dyadic Changes

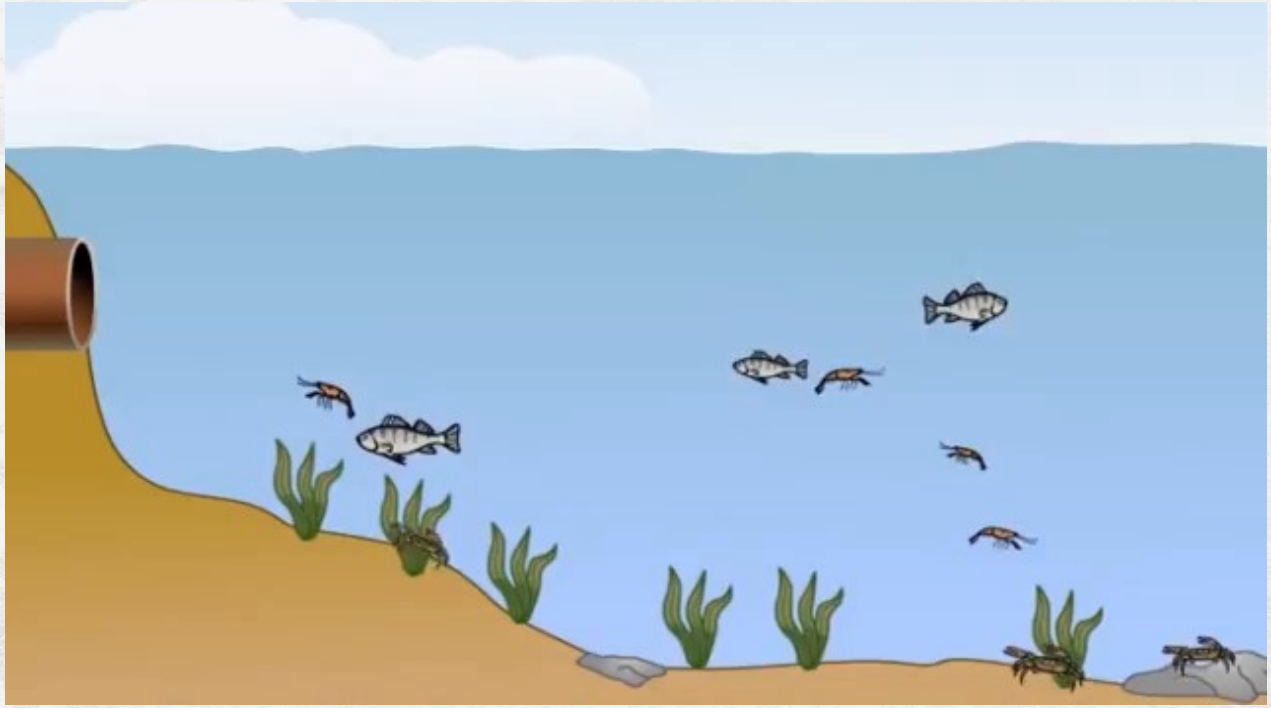


PMRobotics GmbH (2019) Fully Autonomous Formation Flying With Drones
* Three UAS (Unmanned Aerial Systems) ships intercepting and flying forming, camera on fourth

David Ing, 2025

Ecological Changes involve (re)designing whole-whole relations, as shifting regimes (not what's inside your head, what your head is inside of)

- Structural Changes
- Functional Changes
- Behavioural Changes
- **Ecological Changes**
- Processual Changes
- Textural Changes
- Rhythmic Changes
- Polyrhythmic Changes
- (Con)textural Dyadic Changes



Oxford Mastering Biology (2021) Animation E2, 1.1 Consequences of algal blooms
* Pollution → Eutrophication → Algae Bloom → Fish dying and sunlight block → plants dying

David Ing, 2025

Processual Changes ↓ being, ↑ becoming, foregrounding processes (i.e. sequencing, rearranging in time) ahead of objects and structures



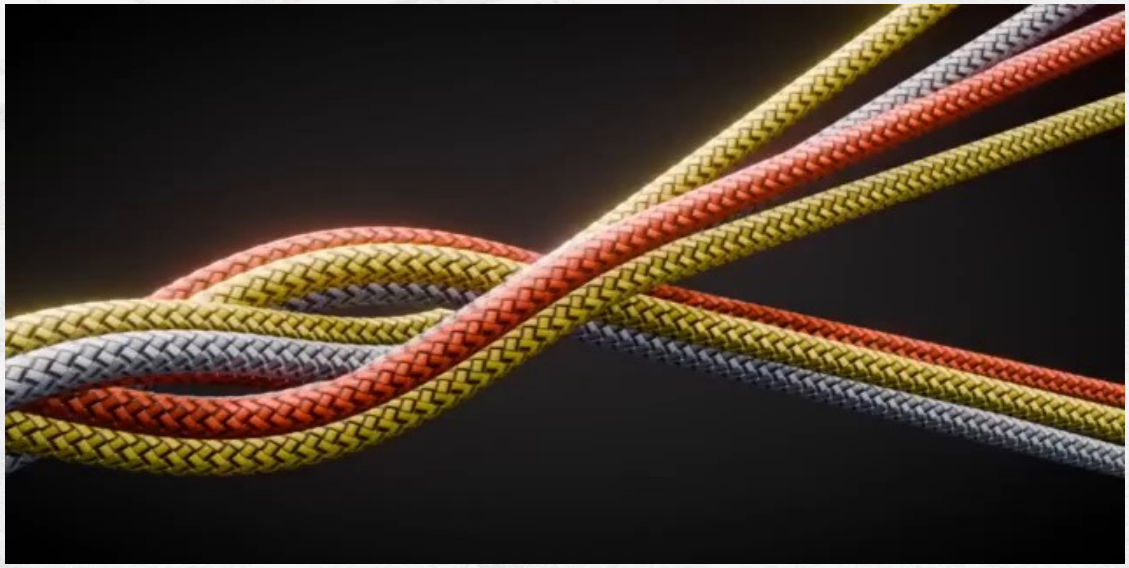


Video Relaxation & Education (2021) Butterfly Metamorphosis

David Ing, 2025

Textural Changes involve threads in time entangled into woven meshworks, tying knots for moments or periods, and casting off

- Structural Changes
- Functional Changes
- Behavioural Changes
- Ecological Changes
- Processual Changes
- **Textural Changes**
- Rhythmic Changes
- Polyrhythmic Changes
- (Con)textural Dyadic Changes

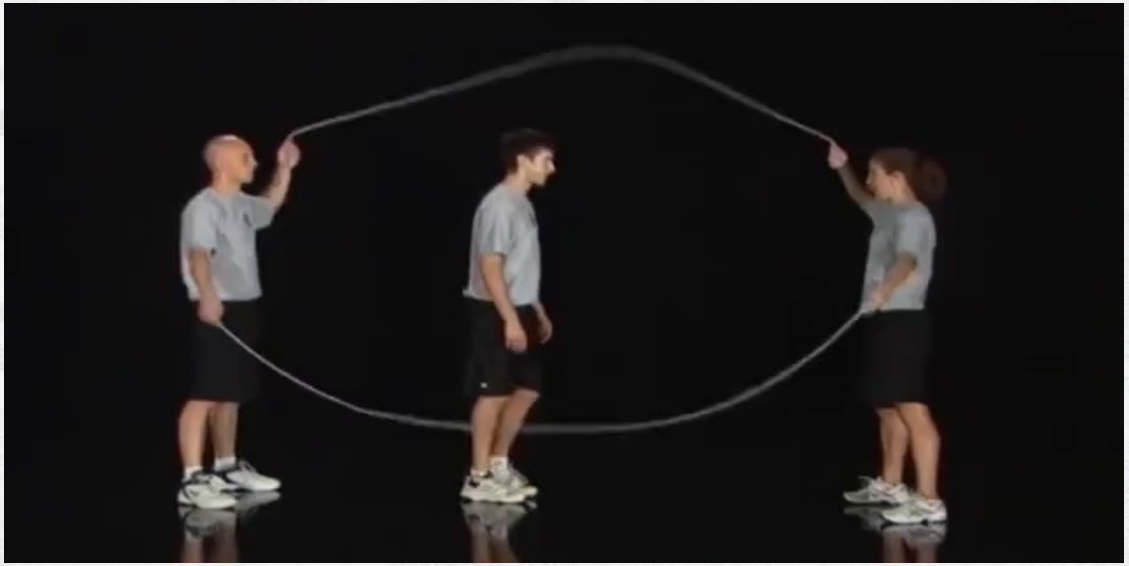


Bradley Animation (2025) Woven Rope Twist Into Braid Formation

David Ing, 2025

Rhythmic Changes involve kairos as qualitative felt time with opportune and inopportune moments

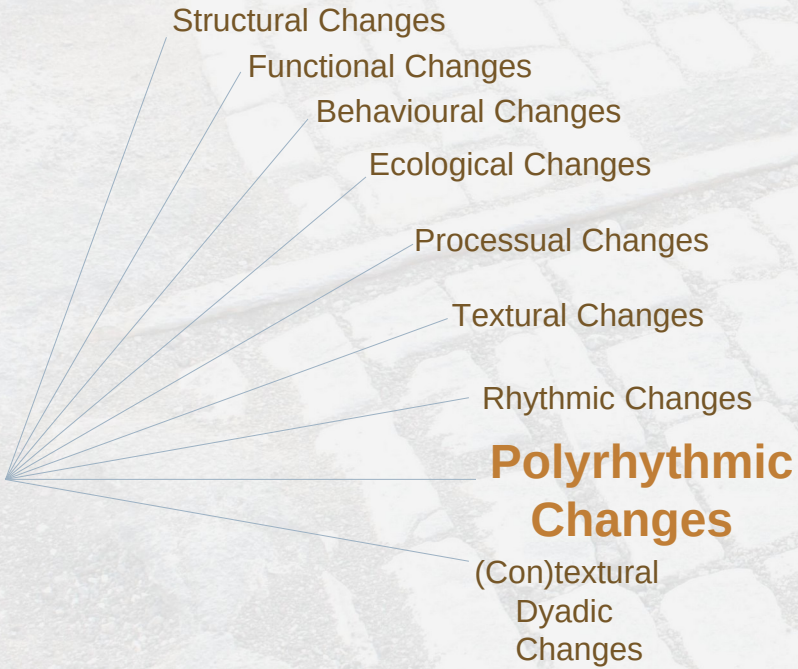




Jump Rope Secrets (2018) Learn Double Dutch Basics

David Ing, 2025

Polyrhythmic Changes involve finding the groove in a kairotic strand in the weaves of tempos, neither rushing nor dragging

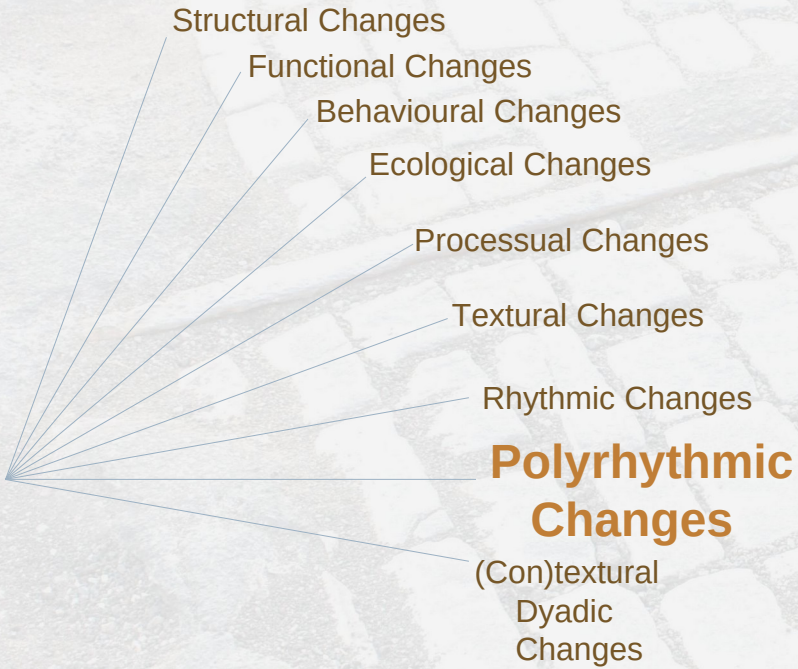




Universal Pictures (2014) Whiplash-- Rushing or Dragging

David Ing, 2025

Polyrhythmic Changes involve finding the groove in a kairotic strand in the weaves of tempos, neither rushing nor dragging





Universal Pictures (2014) Whiplash-- Rushing or Dragging

David Ing, 2025

Polyrhythmic Changes involve yinyang threads [as yang qi (emptying) and yin qi (filling)] in diachronic emergence with yinyang textures

Structural Changes
Functional Changes
Behavioural Changes
Ecological Changes
Processual Changes
Textural Changes
Rhythmic Changes
Polyrhythmic Changes
(Con)textural Dyadic Changes



VirtualSF (2024) Swing Dancing in Golden Gate Park

David Ing, 2025

Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

[Unfreezing → Moving → Refreezing] ⇐ Synchronic *What+Why* pauses; Diachronic ⇒ *When* Shifts Unfolding + *Where* Knots Tying / Untying



MegaMilez (2020) Shooters Pool Gameplay Part 2



IG Company (2021) Beach Volleyball London 2012

David Ing, 2025

Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

Of 5 temporal approaches, systems changes are sequenced ↓ stability as *synchronic* (at time) → ↑ generativity as *diachronic* (through time)

Processual Changes:
- (Re)designing sequences are relatively minor adjustment
- Possibly after major structural changes, reordering a few operational steps

Textural Changes:
- (Re)designing weaves in time → complexity across variety of a roles
- Acknowledging history of timelines (lifelines) → compatibilities to come

Rhythmic Changes:
- (Re)designing cyclical oscillations ⟹ living beings not machines
- Some days better than others, rest and recover expected

Polyrhythmic Changes:
- (Re)designing synchronic tempo as orchestration
- Periodicity of waves may be shortened or elongated
- Plurality of threads with auspicious providence or unfortunate tragedy

(Con)textural Dyadic Changes:
- (Re)designing diachronic pacing in philosophy of body
- Yinyang as (i) emptying (yang qi dissipating), and
  (ii) filling (yin qi concentrating)

David Ing, 2025

Reframing to full *Pacing Changes* [with (Con)textural Dyadic Changes] involves three (philosophical) reorientations

↓Control • Deprecating forceful regulation through action	→	**↑Propensity** • Elevating the concurrence with natural predispositions
↓Causality • Deprecating bias-for-action	→	**↑Rhythmic Texture** • Elevating situational timing for auspicious conditions
↓Teleology • Deprecating pursuit of ends (ideals, objectives, goals)	→	**↑Dyadic Shifts** • Elevating (yin qi) $\propto$ 1/(yang qi)) wayfaring in unfolding wanwu [dissipating $\rightleftharpoons$ concentrating] (emptying $\rightleftharpoons$ filling) transformations

David Ing, 2025

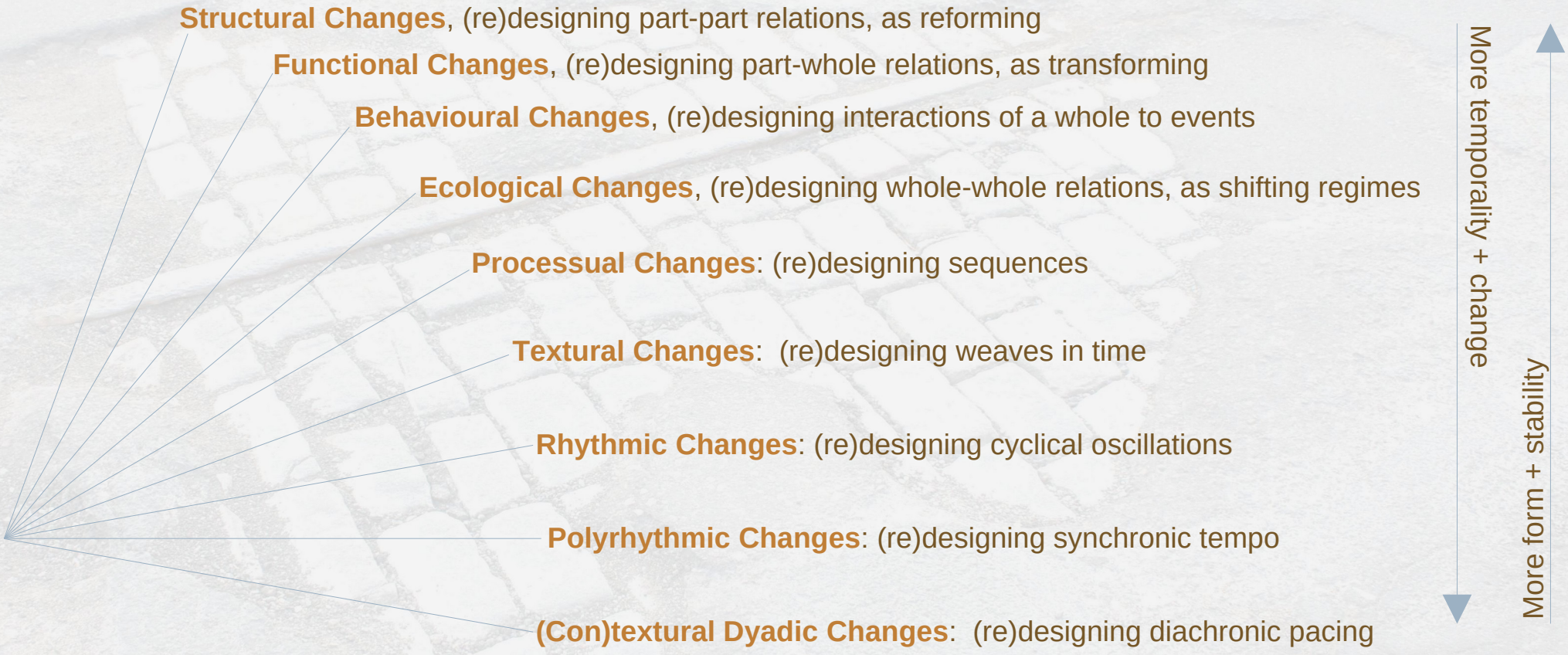
Agenda

A.	Introduction: Systems designed for changes, or with changes?
B.	Method: Multiparadigm Inquiry on Social Systems Theory and General Systems Theory
C.	Systems Approaches to Changes (9)
D.	What+Why, or When+Where?
E.	Resequencing Systems Thinking → Pacing Changes

David Ing, 2025

Summary: Systems Approaches to Change ...

A list of 9 approaches to systems changes, neither exhaustive nor mutually exclusive, ranges concerns from stability to temporality



David Ing, 2025



Image CC-BY Mike Cassano (2009) *Most Interesting Pothole*