

Sciencing and Philosophizing on Threads in Systems Thinking: Tracing through the texture of the socio-technical and socio-ecological perspectives

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67th Annual Meeting, June 19-23, 2023

Kruger National Park, South Africa

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



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Rethinking Systems Thinking

Theme for *ISSS San Jose 2012*, SRBS article 2013

- Since 2019, *Systems Changes Learning Circle* ~ Toronto
 - A 10-year exploration into the meaning of “systems changes”
- In which ways are “**system changes**” different from ..
 - “**changes**”? and
 - “**systems**” + “**changes**”?
- Are there relations between “**system changes**”, and ...
 - Theories of change?
 - Design thinking?
 - Systems design?
 - Systems literacy, etc.?

Western Science

- Measurement
- Hypothesis testing through measurement
- Cause → Effect
- Generalizability
- Predictability

Tavistock Institute (*originally: Tavistock Clinic*)

Founded 1920 as a volunteer group of psychologists and other professionals

- After WWI, treating “neurotic disabilities”
- Disorders were “endemic and pervasive in a modern society”

Combined psychology + anthropology with medicine

- → **Socio-Psychological Systems (SPS)** perspective

Fred E. Emery + Eric L. Trist

- → **Socio-Technical Systems (STS)** perspective
- → **Socio-Ecological Systems (SES)** perspective

Military Selection, WWII

United States

(experimental psychologists)

- Psychometric testing for skills, traits, personality, etc.
- Assumed that results = behavior

Britain

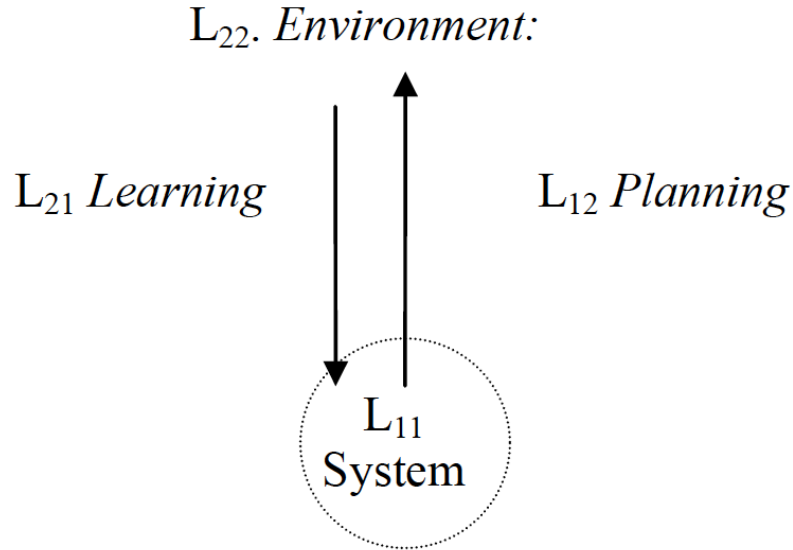
(Tavistock)

- Situational testing to assess leadership, reactions, judgement, etc.
- Placement according to “best fit”

Six systems perspectives → two synthetic perspectives



A. Open System



B. Directive Correlation (adapted from Sommerhoff 1950: 173-4)

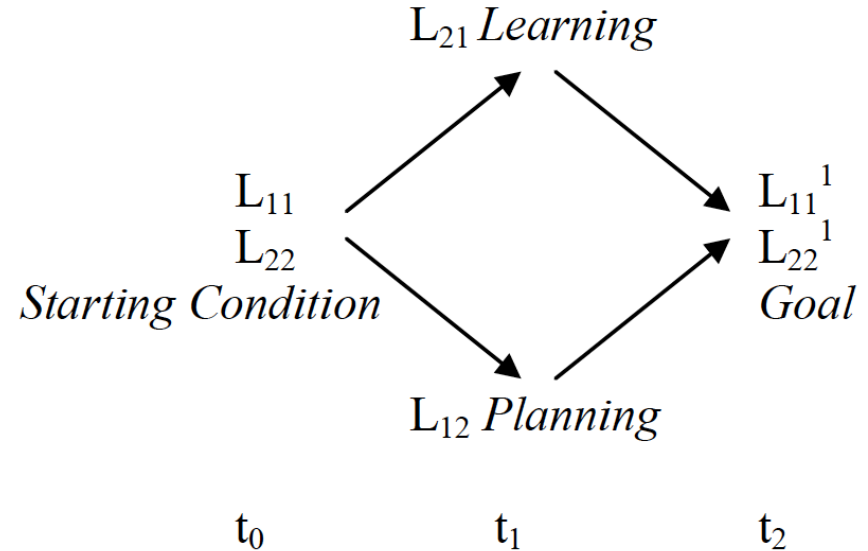
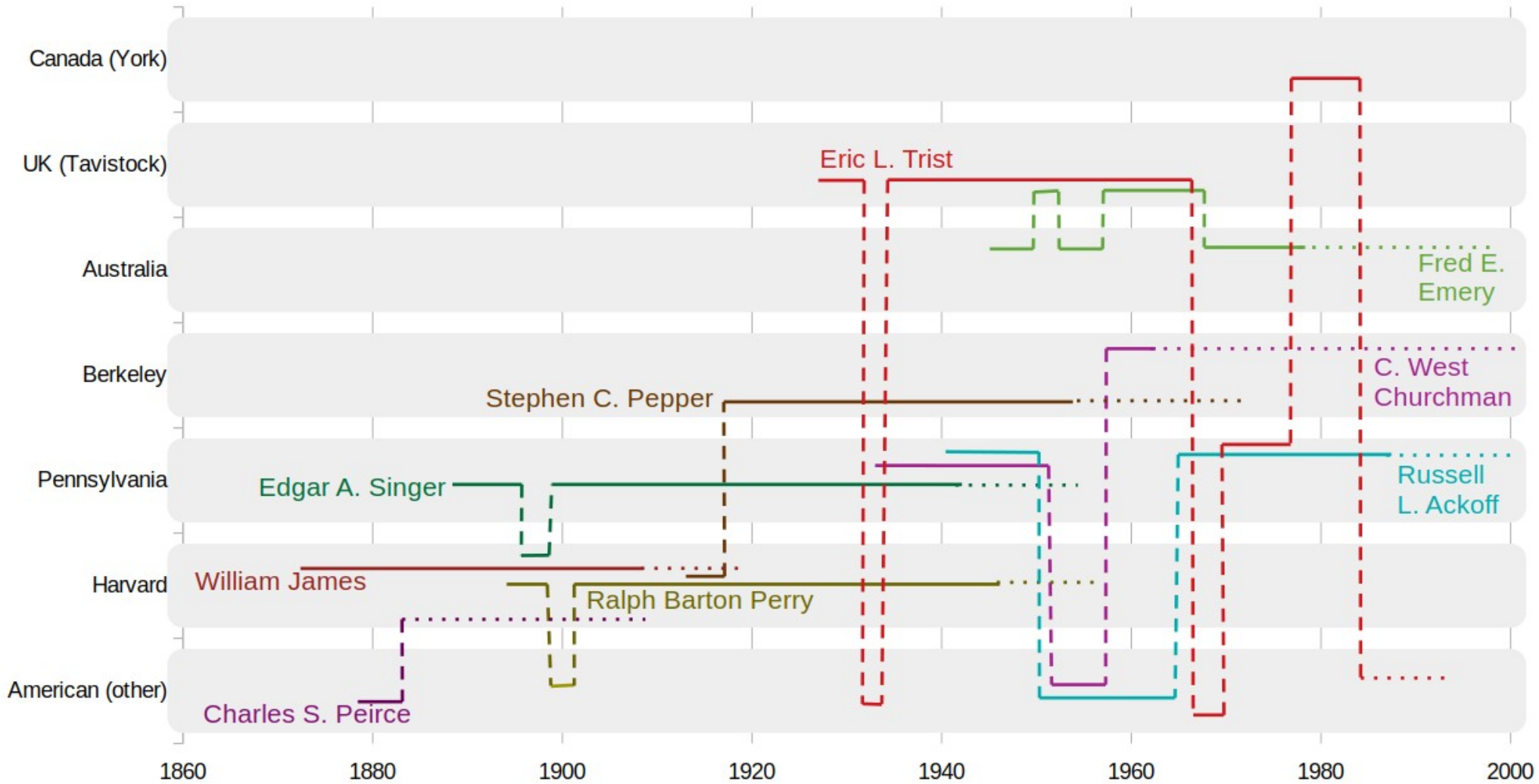


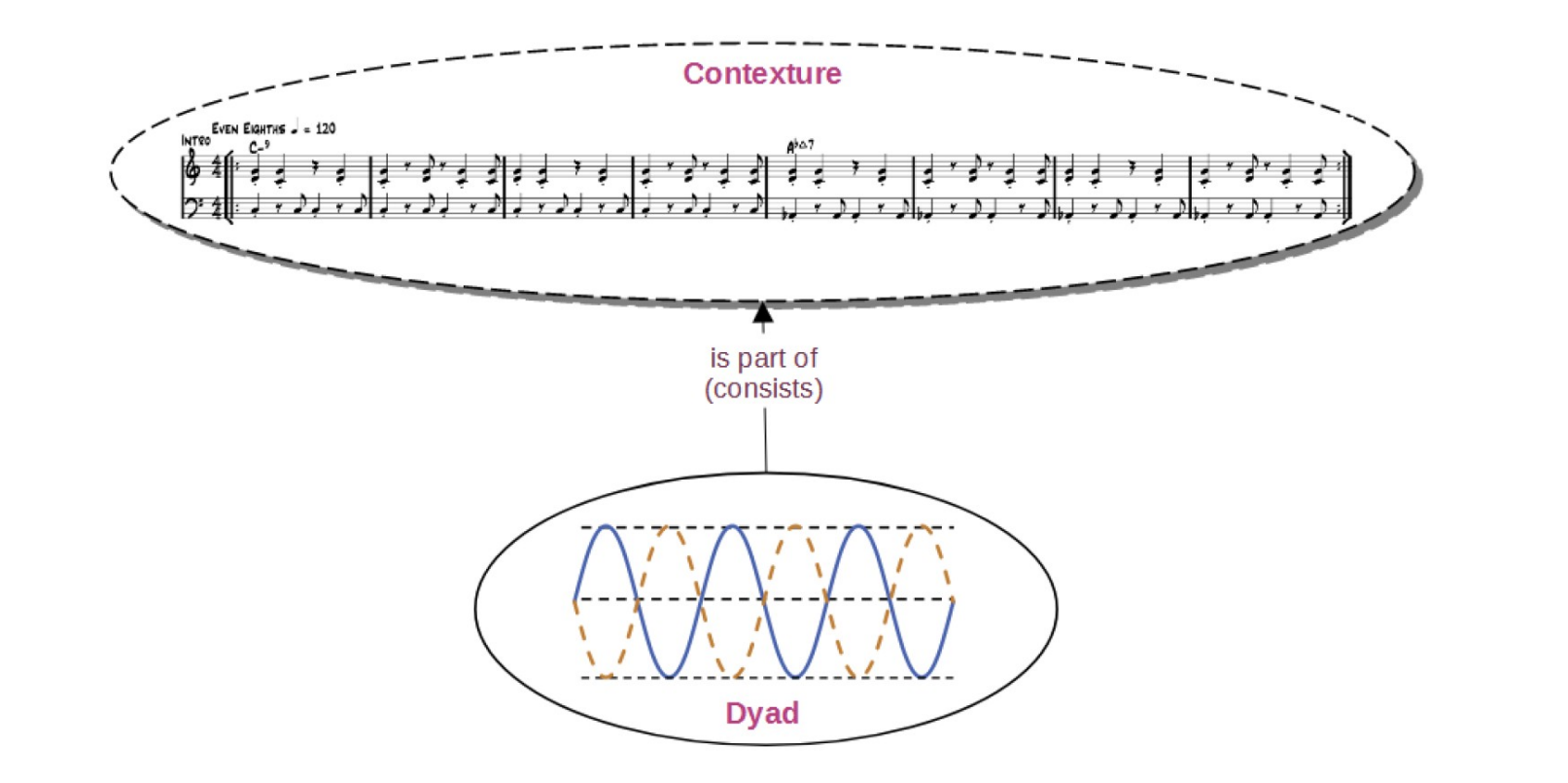
Figure 1. The Basic Models of Open System and Directive Correlation

Pepper (1942) presented 4 *world hypotheses*: (i) formism; (ii) mechanism; (iii) contextualism; (iv) organicism

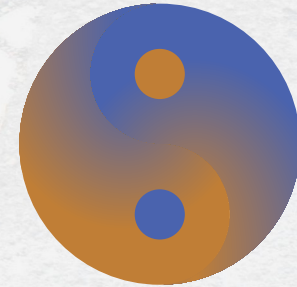
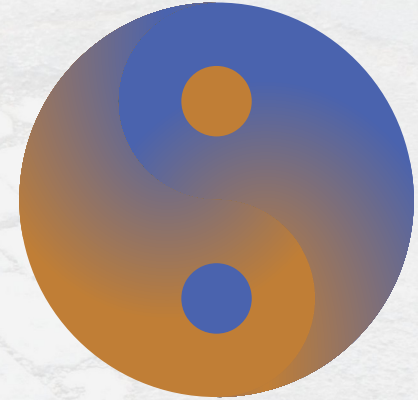
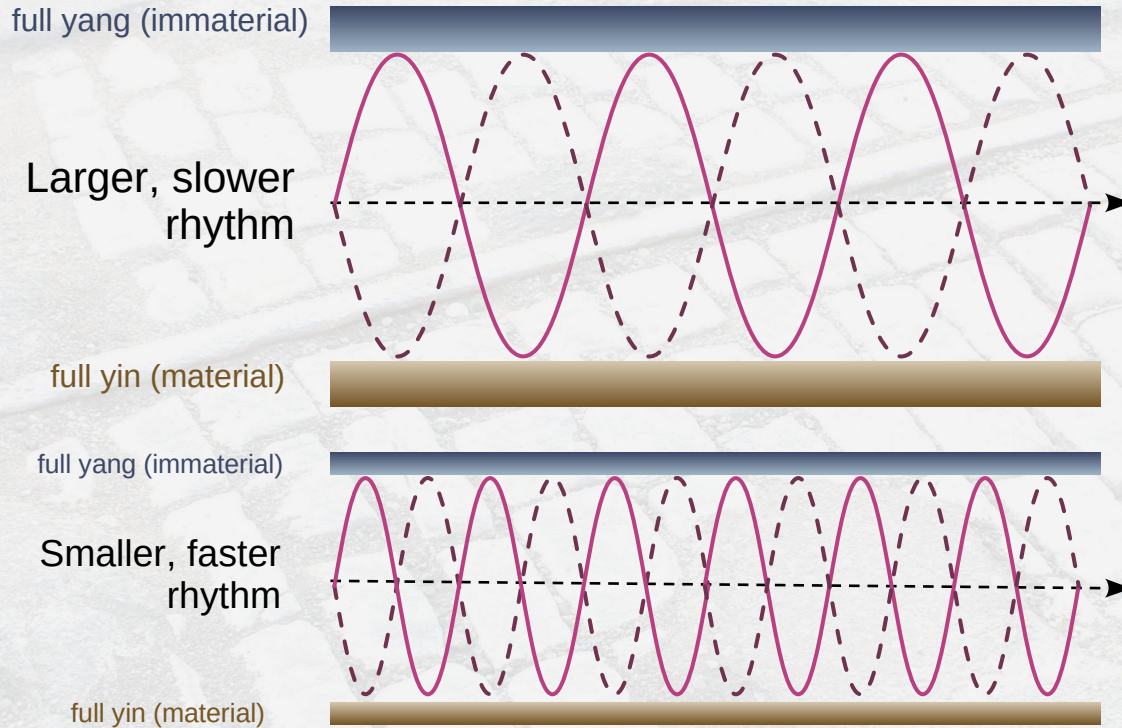
	<i>Dispersive</i>	<i>Integrative</i>
<i>Analytic</i>	Formism <i>Root metaphor:</i> Similarity , as a recurrence of recognizable features	Mechanism <i>Root metaphor:</i> Machine , where exerting force of energy produces predictable outcomes
<i>Synthetic</i>	Contextualism <i>Root metaphor:</i> Situation , as a historic event in its living actuality	Organicism <i>Root Metaphor:</i> Constructive development , with orderliness of changes from stage to stage



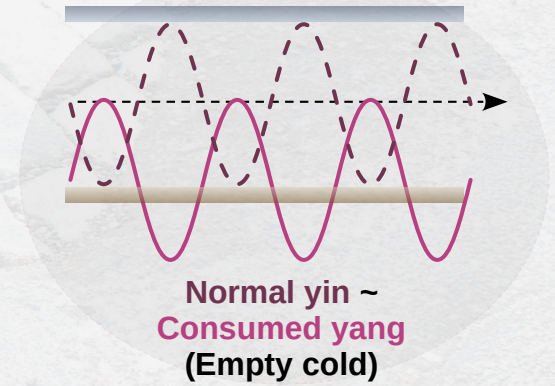
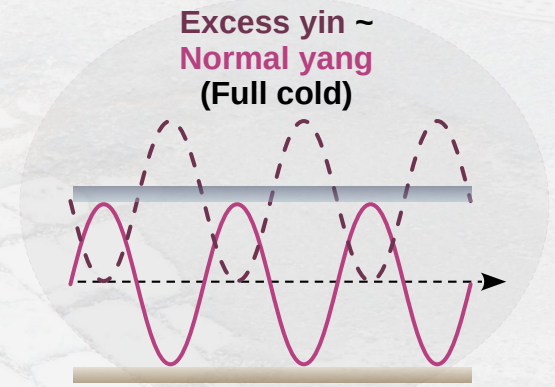
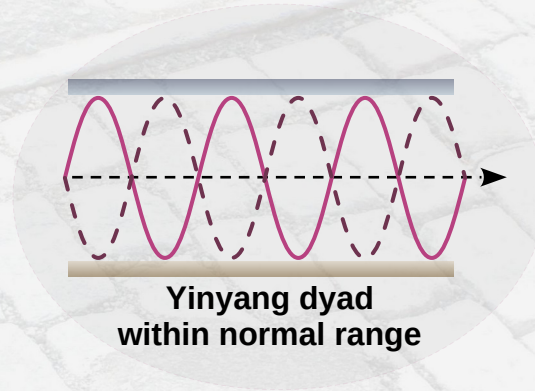
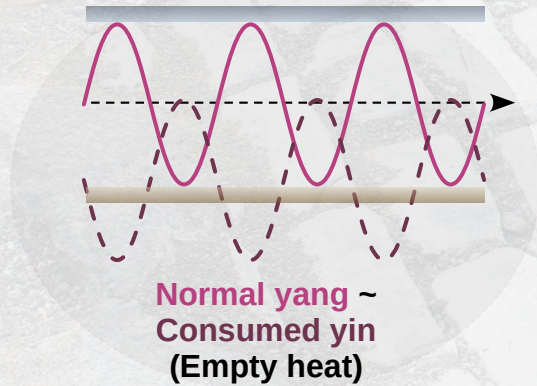
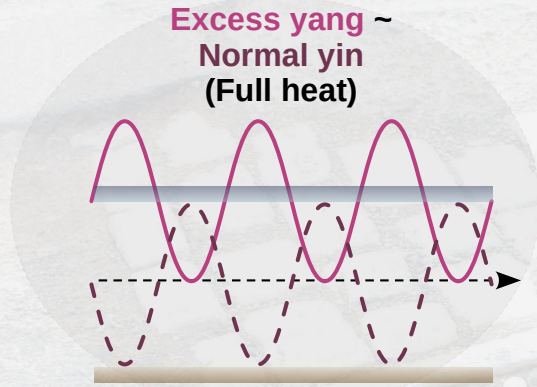
Contexture, represented as a musical score, includes the yinyang dyad



Rhythms can be alongside rhythms, as texture rather than part-whole



Pathologies exhibit excess yang or yin, consumed in a larger rhythm



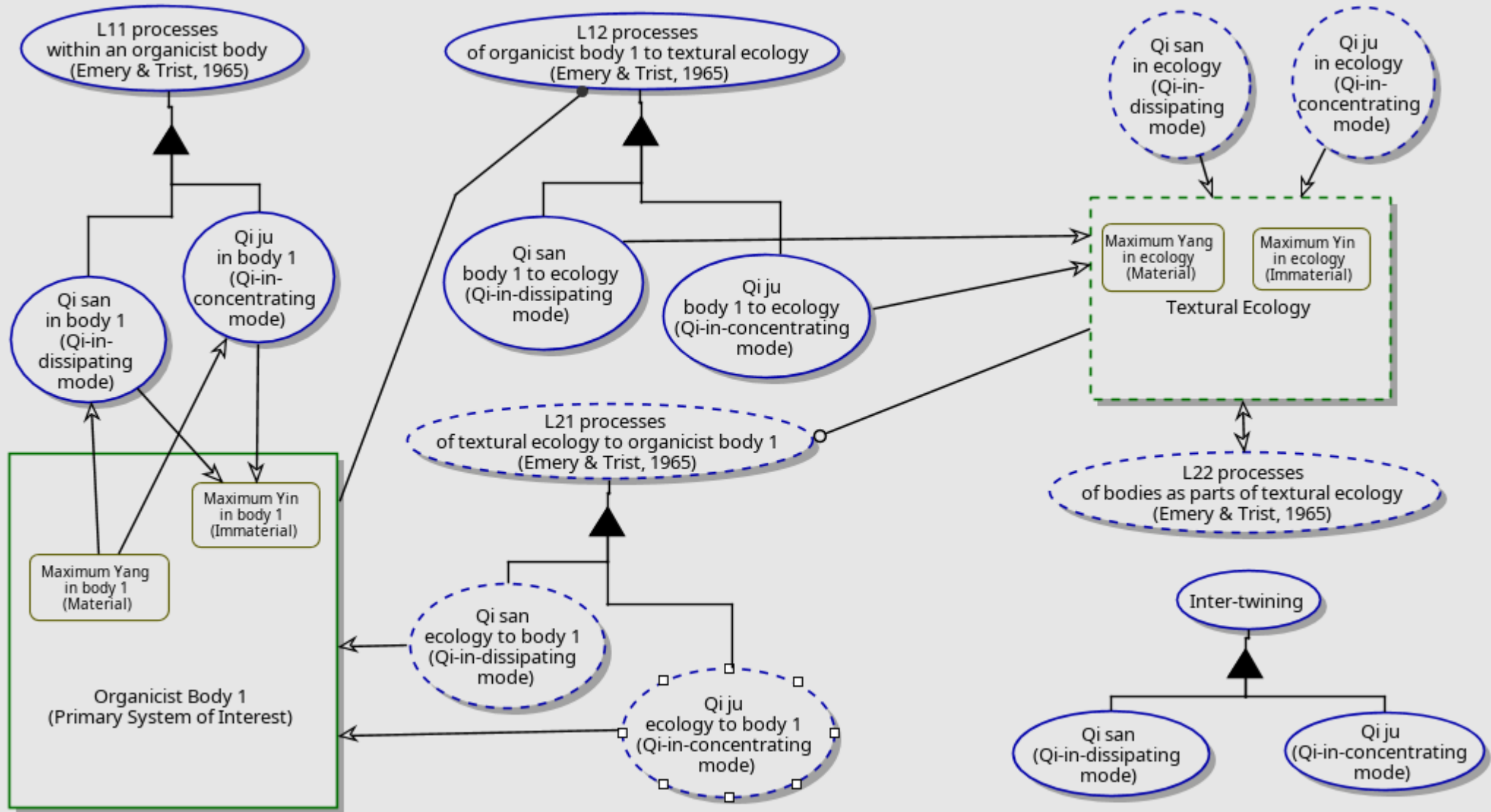




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Appendix:

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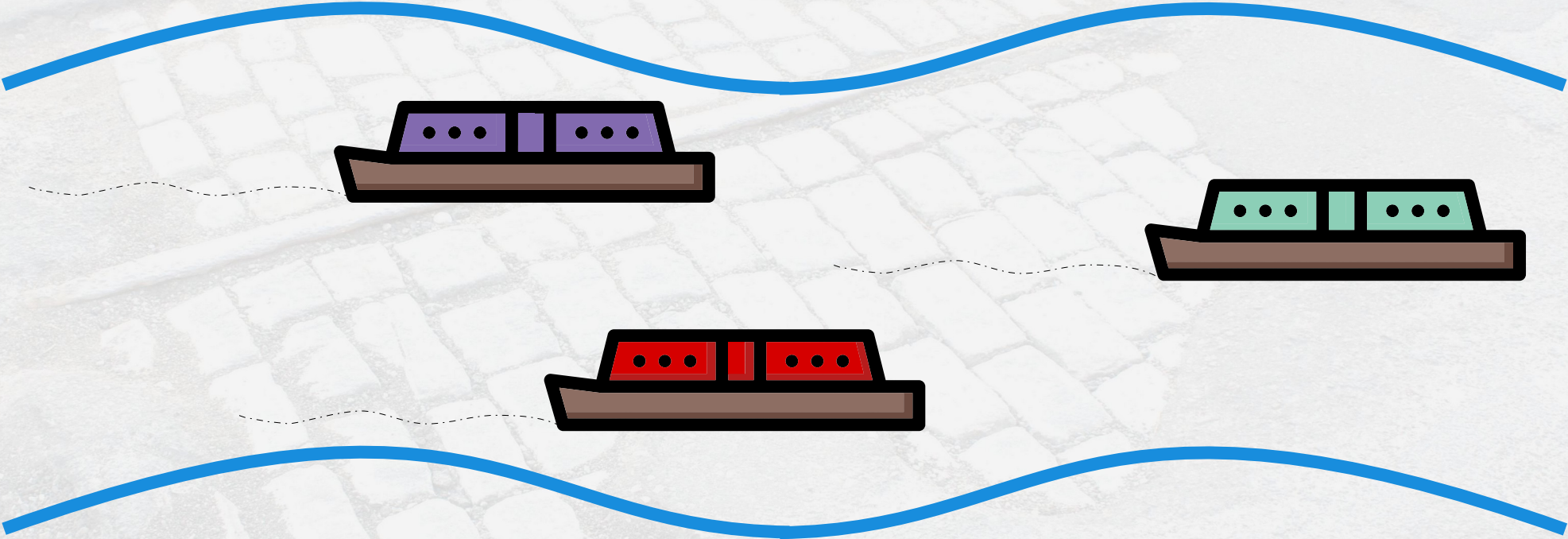
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What does the *texture* in *causal texture theory* mean?



Underlying philosophies can frame systems perspectives

<i>Dispersive?</i>	Ecological Systems Perspective	Socio-Ecological Systems Perspective	Eco-Cultural Systems Perspective
<i>Integrative?</i>	Technical Systems Perspective	Socio-Technical Systems Perspective	Socio- Psychological Systems Perspective
	<i>Analytic ontology?</i>	<i>Synthetic onto-epistemology?</i>	<i>Analytic epistemology?</i>

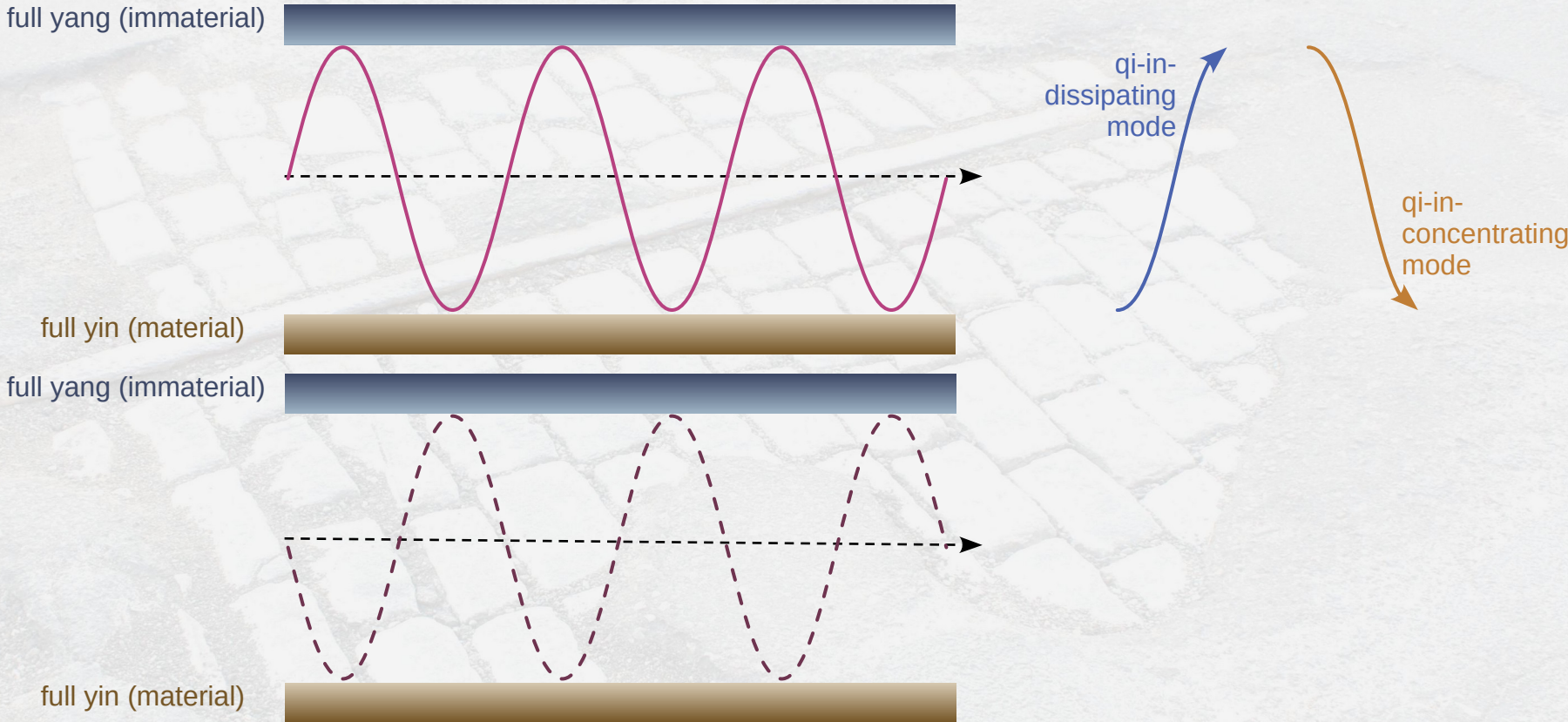
Let's pivot the axes, so synthetic and dispersive are first

	<i>Synthetic</i>	<i>Analytic</i>
<i>Dispersive</i>	<p>Contextualism <i>Root metaphor:</i> Situation, as a historic event in its living actuality</p>	<p>Formism <i>Root metaphor:</i> Similarity, as a recurrence of recognizable features</p>
<i>Integrative</i>	<p>Organicism <i>Root Metaphor:</i> Constructive development, with orderliness of changes from stage to stage</p>	<p>Mechanism <i>Root metaphor:</i> Machine, where exerting force of energy produces predictable outcomes</p>

Dispersive ↔ integrative; Analytic ↔ synthetic

	<i>Synthetic mode of reasoning</i>	<i>Analytic mode of reasoning</i>
<i>Dispersive manner for organizing evidence</i>	<h2>Contextualism</h2> <ul style="list-style-type: none"> • <i>Synthetic:</i> wholes are presumed; parts in relations come inferred • <i>Dispersive:</i> unpredictability (non-determinism) is presumed; determinate order is denied 	<h2>Formism</h2> <ul style="list-style-type: none"> • <i>Analytic:</i> parts in relations are presumed; each whole comes inferred • <i>Dispersive:</i> unpredictability (non-determinism) is presumed; determinate order is denied
<i>Integrative manner for organizing evidence</i>	<h2>Organicism</h2> <ul style="list-style-type: none"> • <i>Synthetic:</i> wholes are presumed; parts in relations come inferred • <i>Integrative:</i> determinate order is presumed; unpredictability (non-determinism) is denied 	<h2>Mechanism</h2> <ul style="list-style-type: none"> • <i>Analytic:</i> parts in relations are presumed; each whole comes inferred • <i>Integrative:</i> determinate order is presumed; unpredictability (non-determinism) is denied

Processes are dyadic, changing from/to material to/from immaterial



Try: socio-technical as dyadic; socio-ecological as contextual

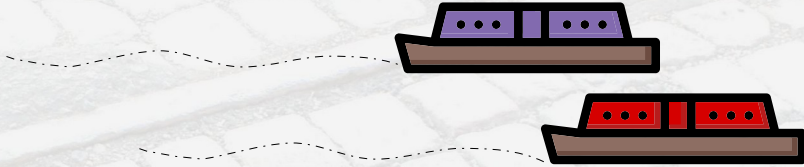
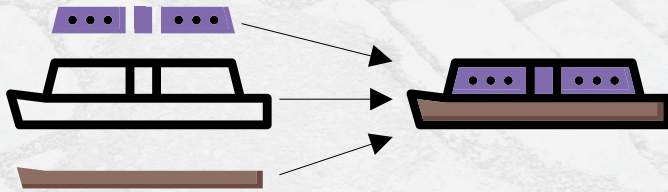
<i>Dispersive</i>	Ecological Systems Perspective	Socio-Ecological Systems Perspective 	Eco-Cultural Systems Perspective
<i>Integrative</i>	Technical Systems Perspective	Socio-Technical Systems Perspective 	Socio-Psychological Systems Perspective
<i>Analytic ontology</i>		<i>Synthetic onto-epistemology</i>	<i>Analytic epistemology</i>



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