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Rethinking work, with the pandemic disruption: metatheorizing with world hypotheses and systems changes

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Abstract

Purpose – As economies have reopened after the COVID-19 pandemic, resumption of pre-pandemic normalcy in work has not been uniform. For each worker and leader, an essential question is whether the world of work has changed irreversibly, or if prior careers and business models can be resumed. A philosophical inquiry into theories of the world of work provides a framing that separates everyday changes from systems changes.

Design/methodology/approach – A metatheoretical approach to world theories from 1942 is revisited. Attention is drawn to systems of knowledge along the dimensions of analytic-deductive treatments, and dispersive-integrative treatments. Socio-Technical Systems relate to Organicism, and Socio-Ecological Systems relate to Contextualism. Reworking a processual philosophy, an alternative World Hypothesis is proposed.

Findings – (Con)texturalism-dyadicism reframes causal texture theory as (1) rhythmic pacing; (2) dyadic diachrony; and (3) transformative reifying. New insights into the effects with the onset and passing of the pandemic disruption are gained.

Research limitations/implications – Updating systems theories of socio-technical and socio-ecological perspectives invokes a post-colonial constructivist philosophy that appreciates roots in American pragmatism, ecological anthropology, and Chinese philosophy of science. The emphasis of systems rhythms prioritizes a processual orientation, compatible with a yinyang material-immaterial onto-epistemology.

Practical implications – As the world recovers from the disruptions of the COVID-19 pandemic, the changed nature of work is only one of many aspects that been altered. Systems perspectives both of parts inside an organization (i.e. socio-technical individuals in groups) and wholes alongside other wholes (i.e. socio-ecological groups co-responding with their (con)textures) are not independent, but interrelated. Disruption of work systems may result in only incremental adaptation for some, with transformative shifts in world theory for others. Recognizing that organizations change from within, persistent pathologies may be diagnosed.

Originality/value – Systems theories of work from the 1960s were based on pragmatism from the 1940s. The metatheoretical contextualism of Stephen C. Pepper is complemented by a 21st century constructivist philosophy that is post-colonial and non-anthropocentric. Reifying organizational systems theories for audiences founded on a Western philosophy of science requires extended explanations bridging over to a non-Western (i.e. Classical Chinese) lineage.

Keywords World hypotheses, Systems theory, Action learning, Contextualism, Yinyang, Propensity

Paper type Conceptual paper

1. Introduction

Organizations are collectives of human beings who come together to get work done. We don't think much about the nature of work, until a disruption happens. The COVID-19 pandemic was a global interruption that impacted every society on Earth. With the 2020–2022 period as

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past history, some expect a return "back to normal." Others have changed their conceptions of work, based on positive and/or negative arrangements accommodating lockdowns.

Research into human work systems has been published since the Industrial Revolution in the 19th century. The modern era saw the introduction of longwall machines in post-WWII coal mines as a major workplace disruption (Trist and Bamforth, 1951). This industrialization led to the study of the Socio-Technical Systems (STS) perspective at the Tavistock Institute for Human Relations, leading to design principles within work organizations (Emery, 1993; Trist, 1981). The mechanization of work led to theorizing on design principles in the social relations between individuals, teams, and the enterprise (Emery, 1993).

Further theorizing on responses to rapid changes outside the enterprise developed in parallel, but became mature only after publication in the 1960s. The causal texture of organizational environments focused on structural change in agricultural and pharmaceutical industries in Britain (Emery and Trist, 1965). This Socio-Ecological Systems (SES) perspective spread more broadly across Europe and into North America (Emery and Trist, 1973).

The COVID-19 pandemic disrupted workplaces in 2020–2022. Factories, storefronts, and offices were largely shut down to minimize physical contact and reduce the spread of the coronavirus. While Work from Home (WfH) options had been acceptable by progressive companies since the rise of personal computing in the early 1990s, more traditional organizations continued to resist remote work. By 2021, WfH became acceptable even in conservative workplaces (e.g. public sector, banking).

Disruptions were felt in many ways. At a micro-level, parents rearranged their homes for temporary or dedicated remote offices, with children in the same household competing for space and Internet bandwidth to join classrooms online. On a macro-level, supply chains were disrupted, interrupting just-in-time production and distribution flows of goods and services worldwide.

Declarations ending the pandemic emergency have largely restored international supply chains. For every individual whose daily life was altered, however, his or her conception of work did not revert to the 2019 world. Many adapted to workplace accommodations, enjoying the flexibility of working online. Employees were not universally motivated to revert to commuting to workplaces, and 9-to-5 schedules.

How might we inquire more deeply into the basic natures of work and workplaces, following disruptive changes? Following the history of science, the STS perspective and SES perspective were built on four distinct ways of understanding, known as World Hypotheses (Pepper, 1942). From those philosophical foundations, this conceptual paper extends 20th-century research towards overcoming incommensurability across four root metaphors. A new theory of work and organizations is offered to appreciate systemic change, crossing over to classical Chinese philosophy for a more processual stance.

1.1 Disruption exposes ways to explore systems theories of work

Ways in which we think about organizations as systems depend not only on industry classification of each enterprise, but also the styles in which they operate. In the STS style, seven *Images of Organization* characterize theories, processes, and viewpoints based on foundational metaphors (Morgan, 1986). The dominant image of organizations as *machines*, with interlocking parts contributing towards a functioning whole, orients towards role definitions where individuals are regarded as interchangeable parts. The second most popular image of organizations as *organisms* recognizes species suited to different environments, born, developing, and dying, and/or evolving. Less salient metaphors include: organizations as *brains*, processing information for learning; organizations as *cultures*, with values, beliefs, and rituals; organizations as *political*, with interests, conflicts, and power plays; organizations as *psychic prisons*, with people trapped in the psychodynamics of unconscious minds; organizations as *flux and transformation*, as autopoietic, chaotic, cybernetic or dialectical in change; and organizations as *instruments of domination*, with struggles between rationality and emancipation.

An inquiry into systems theories of work should recognize not only STS influences, but also SES effects from the pandemic interruption. In *Seven Crashes*, economic and financial changes advance or deter globalization marked by dramatic changes in prices, and in production and distribution through international trade (James, 2023). Economic crises can be distinguished by supply shocks and demand shocks. A supply shock changes the ability of producers to make goods. A negative supply shock constrains inputs, increasing prices. A positive supply shock, for example, new production technology, enables innovations to lower prices and expand outputs. A demand shock affects spending by individuals, businesses, and/or governments. A positive demand shock leads to more economic activity with rising prices and increased consumption. A negative demand shock, for example, financial crises, pushes down both prices and consumption.

Of the seven crises described by Harold James, the first four predate any human being alive today. The Great Famine of the 1840s was a negative supply shock. The Panic of 1873 was a positive supply shock. The Great War of 1914–1918 was both a negative supply shock and a negative demand shock. The Great Depression of 1929–1939 was a negative demand shock.

Two more recent crises would be remembered by Baby Boomers and Gen Xers. The Great Inflation of 1965–1982 was a negative supply shock of high inflation, high unemployment, and low economic growth. OPEC increased oil prices, and the Club of Rome published *Limits to Growth* in 1972 warning of constraints on nonrenewable resources. The Global Financial Crisis of 2008 was a negative demand shock, reducing globalization as markets contracted and skepticism grew about the efficacy of government interventions. The subprime mortgage collapse in the USA led to the interbank market saw financial institutions unwilling to take on the exposure risks of others.

The last of seven crises is characterized as impacting Baby Boomers, Gen Xers, and Millennials in the workplace, and Gen Alpha students not yet in the workforce. The Great Lockdown of the COVID-19 pandemic is categorized as a positive supply shock. Although the short-term effects of supply constraints might be perceived as a negative supply shock, James sees a long-horizon positive impact on globalization with prior mRNA research as a breakthrough technology globalized through accelerated commercialization.

The STS and SES perspectives are systems approaches from a WWII heritage that can be revisited in the 2020s. When veterans returned home changed from wartime experiences, the families, friends, and coworkers not engaged in direct battle had also changed. The period following COVID-19 Lockdown can be characterized as *history-making*, with subworlds that become more widely disclosed to the larger world (Spinosa *et al.*, 1999). After the worldwide pandemic interruption of everyday work, calls for returning to prior dominant norms were not unchallenged. Up to 2019, a premise of lifetime employment by an enterprise had been eroded through impermanence of contracted relations, sequential entrepreneurship and/or stitched-together part-time work. The 2020–2022 furloughs, layoffs, closed business and WfH changes altered the way that employers and workers interpreted their relations.

As a working definition, a *systems theory* is a way of looking at the world in which phenomena are viewed as interrelated rather than isolated, and complexity has become a subject of interest (Hammond, 2003, p. 11; Klir, 1972, p. 16). *Systems* are specified in plural: there is more than one system at play. Systems theories of work in 21st-century organizations don't presume *ceteris paribus* conditions, that is, treating the external environment as stable while internals are in flux; or treating the internal organization as stable while the environment is in flux. Changes should also be specified as plural: there's more than one change to deal with, at any time.

1.2 Systems theories from the 1960s–1980s providing starting points for inquiry

The STS and SES perspectives developed in the post-WWII industrial era, originating with Fred E. Emery and Eric L. Trist. The STS perspective theorized the reorganization of work in Yorkshire coal mines, as the craft production of men with shovels and pickaxes gave way to

factory shifts progressing a longwall machine (Emery, 1993; Trist, 1981). The SES perspective theorized organizations as wholes, dealing with types of environments ranging from placid to turbulent (Emery and Trist, 1965). These theories were at the root of conventional wisdom by the mid-20th century for organizations with manufacturing production lines. In the 21st century, STS and SES perspectives still have relevance for many enterprises, while the history of the theory-building has largely been forgotten.

The information revolution associated with digital technologies in the 1990s changed the nature of work for many. For knowledge workers and software developers, the STS concerns of human beings placed into mechanistic design echoed those of coal miners. Actors in value constellations or in links of disaggregated supply chain spanning regions and time zones can draw out SES considerations about competition and collaboration. Ubiquity of the Internet has altered organizational cycle times down from weeks or days to hours. Outsourcing and farshoring has normalized remote work and digital nomads. The temporality for organizations in the 21st century can be different from the temporality in the 20th century.

Following the volatility in lives following two World Wars, the desire for order sought systems theories foregrounding equilibrium, stability, and homeostasis. Modernism emphasized *function* (i.e. contribution of parts to the whole) and *structure* (arrangement in space) (Ackoff, 1971; Gharajedaghi, 2011; Ing, 2013). The recent rise of interest in *systems changes* makes more prominent the primacy of *process* (that is, arrangement in time) and behavior (that is, an autonomous act, a reaction, or a response).

Beyond multiple worldviews (that is, cognitive orientations) and multiple paradigms (that is, metatheory or metascience), putting *process* into the foreground leads to an exploration of metaphilosophy (that is, consideration of alternative schools and methods of philosophies). Trist and Emery developed the Tavistock Legacy on the foundational metaphilosophy of Stephen C. Pepper with *World Hypotheses (1942)*. A deeper dive into this underappreciated contribution by Pepper is digested in Section 3 below.

Sweeping in the philosophy underlying (1) ecological anthropology, and (2) the science of Classical Chinese Medicine, regrounds systems theory towards temporality and process. A new world hypothesis of (con)texturalism-dyadicism extends organizational systems theory in Section 4 below. This explication is part of an ongoing program of rethinking systems thinking (Ing, 2013) initiated with a working group in Toronto in 2019 (Ing, 2022). Systems theories are recast with (1) rhythmic pacing, (2) dyadic diachrony, and (3) transformative reifying. This recasting challenges presumptions of a "return to work" from pre-pandemic times, towards "systems changes in work" due both to altered preferences amongst workers, and to adaptations of organizations in the reframing of work.

Lastly, but importantly, methodological applications based on a new world hypothesis are a contribution to organizational systems research. In Section 5 below, explaining the processual nature of a postcolonial constructive philosophy embracing the processual nature of yinyang as a Chinese dyadic philosophy is presented as a major obstacle for Western-educated practitioners.

2. Post-pandemic labour movements set a scene for metatheoretical development

Most workers and organizational leaders enter a system of work with legacy. The legacy comes with expectations on role definitions offered by organizations and accepted by workers. The COVID-19 pandemic led to historic government directives, and unprecedented workplace changes by employers. Not only was the conception of work life altered, but also the patterns of life at home, in the family, and with neighbors, were reformed. Layoffs, reduced benefits, and Work-from-Home decisions changed the nature of the work to be done. Presuming that a pre-pandemic theory of work would persist through such a major disruption suggests that the "old normal" would just pick up where we left off. The *Great Resignation* and *Quiet Quitting* may reflect transformed thinking, rather than temporary adaptations.

2.1 In 2021, increased job-to-job mobility was labelled as the Great Resignation

Government statistics from 2021 have now confirmed the post-pandemic phenomenon known as the Great Resignation (Chugh, 2021). In February 2020, COVID-19 was officially named by the WHO. March 2020 saw travel bans come into place. Remote learning at schools became common from mid-2020. In December 2020, emergency use of COVID-19 vaccines was approved in many jurisdictions, so that population-wide injections occurred in winter and spring 2021. Some return to normalcy was exhibited by the gradual return to in-person learning at schools from in 2021 from late spring to early fall.

By fall 2021, almost all OECD countries exhibited labour shortages. Job vacancy rates, compared to 2019, were highest in Canada, Australia, Britain, France and the United States. Quit rates increased the most in the USA, Spain, Latvia, France and Italy (Causa *et al.*, 2022).

The Federal Reserve Bank of Chicago, in fall 2021, found that employed Americans showed record job-to-job mobility by quitting their jobs and switching to a new employer (Faccini *et al.*, 2022). Low labour market slack was estimated to contribute 1% to inflation.

The Federal Reserve Bank of St. Louis recast some of the *Great Resignation* actually as a *Great Reallocation*. In fall 2021, the industries in the USA exhibiting the greatest number quits above pre-pandemic levels were in manufacturing and construction. In leisure industries, job-to-job mobility was higher as a reallocation from one employer to another (Birinci and Amburgey, 2022).

In 2020, uncertainly about the pandemic saw employees choosing to not leave their jobs. Analysis of the *Great Resignation* of 2021 concluded factors in three categories:

(1) conditions with the pandemic, that: (a) enabled time to reflect on career opportunities; (b) increased fears of reinfection by Delta and Omicron variants; (c) increased stress as the loss of normal social interactions hurt physical and mental health; (d) some reluctance to return from hybrid and remote work to the physical workplaces; and (e) challenges to compliance with mandatory vaccination or weekly testing procedures;

(2) an employee-driven labour market with many alterative job opportunities; and

(3) the lack of organizational support on work-life balance, employee assistance programs, and appropriate IT infrastructure and training (Tessema *et al.*, 2022).

These factors led to mass resignations of employees to move to organizations with better offers.

2.2 In 2022, workplace disengagement has been labelled as quiet quitting

Quiet Quitting rose as a label in fall 2022, triggered by social media attention. This drew attention to workers who are not going above and beyond their job descriptions, and instead just meeting minimum requirements. In a Gallup poll, over 50% of the US workforce were thought to be quiet quitters, with 18% of employees actively disengaged (Harter, 2022).

The phenomenon of "quiet quitting" was not found in Canada by Robert Half. Surveys found 59% of employees going above and beyond requirements, and only 5% of employees doing the minimum, due to burnout (French, 2022).

The *National Bureau of Economic Research* has differentiated between the *Great Resignation* in 2021, and *Quiet Quitting* in 2022. Between 2019 and 2022, the total number of hours worked in the United States declined by 3%. Half of the decline was due to fewer people working (the *Great Resignation*), and half was due to working fewer hours (*Quiet Quitting*). For the fewer people working, younger males without bachelor's degrees had a participation rate 7% lower than cohorts with college education. The decline of hours per worker was higher for men than for women. Evidence indicates that the hours reduction amongst workers was voluntary, and was expected to persist (Lee *et al.*, 2023).

Additional research into Quiet Quitting outside of North America have not as yet been released.

2.3 Beyond earning money, theories of work are focused primarily on job satisfaction

In exploring *Why We Work* from a psychological perspective, the primacy of incentives (i.e. working for pay) is presented as a false rationale (Schwartz, 2015). A dominant ideology persists, with leaders assuming that for people to do good work, monetization is the primary driver of their efforts. An alternative "idea technology" is speculated, elevating the design of workplaces with a *telos*, an appropriate ultimate purpose for collective activity. In a *telos*, workers could find challenge, meaning, engagement, and satisfaction (Nesterak and Schwartz, 2022).

An anthropological perspective correlated (1) the decline of workers through automation in productive domestic, industrial, and farming jobs, with (2) the rise of professional, managerial, clerical, sales and service jobs as pointless "bullshit jobs" (Graeber, 2013). In a subsequent UK poll of 849 working adults on whether their jobs were "making a meaningful contribution to the world", 37% responded no, while 50% responded yes (Dahlgreen, 2015). In a broader study of whether workers considered their jobs *socially useless*, a dataset tracked 100,000 workers in 47 countries across 1989, 1997, 2005, and 2015. Contrary to the earlier UK study, 92% responded no, while 8% responded yes (Dur and van Lent, 2019). Of the 8% who considered their jobs socially useless, half didn't mind having that job.

In an economic study of decennial censuses from the USA from 1950 to 2000, responses on feelings about work by gender were affected by evolving occupation categories. The shift from factory work into professional and managerial roles by women improved their overall happiness. In contrast, the shift from farming and factory work into professional and service occupations by men saw their overall happiness decline. Overall, with the total number of hours worked has not decreasing, evidence for the *disutility of work* was not found (Kaplan and Schulhofer-Wohl, 2018).

A systems theory of work would not deny that job satisfaction and meaningful work are contributing factors on choices made in employment relations. The COVID-19 disruption draws in additional considerations of the impact of work on life and everyday living conditions, for example, family life, workspace availability, technical facility, etc. While the United Nations agency on health declared in January 2023 that "there is little doubt that this virus will remain a permanently established pathogen in humans and animals for the foreseeable future" (WHO, 2023), theories of work from prior to 2019 have not adapted to the new systems realities.

2.4 Pandemic disruptions cumulatively encouraged reflecting on theories of life, and of work

A systems approach to work should rise to challenge of asking if the world of work, within a larger world of living, has changed. This question is perhaps better addressed as a philosophical inquiry.

In the phenomenology following Martin Heidegger, a *world disclosure* is the way that human beings understand everyday encounters with things and each other. Gaining the initial understanding of a world is a *first-order disclosure* that is implicit, unconscious, and largely passive. The first few weeks of COVID-19 pandemic directives by governments and organizations led to workers making temporary adaptations according to first-order disclosure. The understanding of the way that we negotiated ourselves in the world remained anchored to everyday practices to which we have been accustomed for years. A *second-order disclosure* is an explicit reworking of meaning, in a refocusing or de-centering of our understanding (Kompridis, 1994). After months and years of pandemic directives, second-order disclosure challenges the meaning of work in our lives. Many have come to accept that everyday practices prior to historic COVID-19 pandemic period might not resume. The circumstances of our everyday lives – as world theories – are altered.

World theories, from a tradition of pragmatism, come through a theory of knowledge based on doubt. In a philosophy based on common sense, a scientific theory can be disproved, yet the truth of the theory cannot be absolutely proven. The adequacy of a hypothesis is based on the evidence that supports it. The 1942 metaphilosophy of world hypotheses by Stephen C. Pepper can be applied to the question of second-order world disclosure.

3. World hypotheses is metatheory preceding 1960s systems theories

The 1942 book *World Hypotheses* was cited as a precedent to systems thinking, with its particular omission mentioned in a footnote to a 400-page paperback of selected readings (Emery, 1969, p. 15). Contextualism was the foundation for causal texture theory (Emery and Trist, 1965) and the Socio-Ecological Systems perspective.

In Section 3.1 below, four relatively adequate World Hypotheses constructed by Pepper are reviewed, excluding the Animism and Mysticism judged as inadequate on grounds of scope and precision.

In Section 3.2 below, the two dimensions of the matrix are further explicated. Pepper warned against "eclecticism" in mixing World Hypotheses. Organicism is identified as the root metaphor for STS, and contextualism for SES.

In Section 3.3 below, each of the four root metaphors is detailed with theory of truth, categories, and nature of time. Distinctions on the nature of time become important in consideration of a new World Hypothesis.

In Section 3.4 below, the contextualism of Pepper from 1942 is associated with the contextural action research approach by followers of Eric Trist circa 1980. Complementary views on temporality are drawn across (1) (causal) texture in organization studies by Eric Trist, (2) meshwork in the ecological anthropology of Tim Ingold, and the (3) contextual-dyadic thinking in Classical Chinese philosophy of science, leading to a new World Hypothesis of (con)texturalism-dyadicism.

3.1 Four world hypotheses were proposed by Pepper, each with a root metaphor

Pepper named four distinct world hypotheses with unfamiliar names, and loosely coupled them with prior philosophical schools. With each world theory, a root metaphor is induced.

(1) *Formism* is associated with *realism*, and the *idealism* of Plato and Aristotle. Its root metaphor is *similarity.*

(2) *Mechanism* is associated with *naturalism* or *materialism*, with philosophers such as Rene Descartes, John Locke and David Hume. Its root metaphor is a *machine.*

(3) *Contextualism* is associated with *pragmatism*, and philosophers such as Charles S. Peirce, William James, Henri Bergson and John Dewey. Its root metaphor is a *situation* (described by Pepper as a historic event, or an act within a setting).

(4) *Organicism* is associated with *absolute idealism*, and philosophers such as George F. H. Hegel and Frances H. Bradley. Its root metaphor is *constructive development* (described by Pepper as integration, refinement towards an ideal).

Root metaphor theory builds on maxims, which can be taken as principles or rules on which knowledge is built.

Maxim I: A world hypothesis is determined by its root metaphor. In application, several systems theories could be based on a shared root metaphor.

Maxim II: Each world hypothesis is autonomous. A systems theory should be independently judged on adequacy by the reliability in its corroboration of evidence within. A systems theory should stand on its on evidence, and not on the shortcomings of an alternative theory.

Maxim III: Eclecticism is confusing. Systems theories are mutually exclusive from each other, based on different root metaphors. Mixing metaphors can introduce conflicting facts, leading to contradiction and a reduction of reliability.

Maxim IV: Concepts which have lost contact with their root metaphors are empty abstractions. A systems theory can grow old, so that associated abstractions get taken for granted. Rejuvenation comes through tracing evidence back to the root metaphor.
In essence, each world hypothesis is itself a system of knowledge, with a root metaphor at its core. Improving the reliability of multiple systems theories without contradiction is practical only if they share the same root metaphor.

The four world hypotheses described with root metaphors above are explicated in the next section along dimensions of analytic – synthetic treatments, and dispersive – integrative treatments.

3.2 A schema for hypotheses arranges ways for evidence to be recognized and interpreted

Pepper arranges the hypotheses according to two types of treatments that can be depicted as polarities. The four world hypotheses are laid out as a matrix in Table 1 below.

Formism is analytic and dispersive. The root metaphor of *similarity* reasons from parts into a whole, while the evidence arrives unpredictability for organizing.

Mechanism is analytic and integrative. The root metaphor of a *machine* reasons from parts into a whole, while evidence arrives in a determinate order.

Contextualism is synthetic and dispersive. The root metaphor of *situation* reasons from the whole into parts, while evidence arrives unpredictably for organizing.

Organicism is synthetic and integrative. The root metaphor of *constructive development* reasons from the whole into parts, while evidence arrives in a determinate order.

Systems thinking recognizes both synthesis and analysis. Authentic systems thinking works against reductionism by sequencing reasoning through synthesis (that is, putting into wholes) before reasoning through analysis (that is, taking into parts) (Ackoff, 1981, pp. 16–17; Ing, 2013, p. 529).

In organization theory, the STS perspective relates to organicism (Barton *et al.*, 2009; Trist, 1981). The SES perspective relates to contextualism.

Table 1. World hypotheses by types of treatments of evidence [CC-BY David Ing]

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

Source(s): Authors' work

3.3 Socio-technical is part-whole organicism; socio-ecological is whole-whole contextualism

Root metaphor theory works as "the theory that a world hypothesis to cover all facts is framed in the first instance on the basis of a rather small set of facts and then expanded in reference so

as to cover all facts" (Pepper, 1935, p. 369). Each world hypothesis has its own theory of truth, and categories, summarized in Table 2 below.

Table 2. Root metaphors, theories of truth, categories, nature of time [CC-BY David Ing]

World Hypothesis	Dispersive manner for organizing evidence	Integrative manner for organizing evidence
Analytic mode of reasoning	**Formism** *Root metaphor*: Similarity, as recurrence of recognizable features *Theory of truth*: Correspondence between (an) instance(s) and a likened ideal *Categories*: Characterizations (of qualities and relations) *Nature of time*: Universal or irrelevant	**Mechanism** *Root metaphor*: Machine, where exerting force or energy produces predictable outcomes *Theory of truth*: Causal adjustment to a mature nominalism (i.e. named response to stimulus) *Categories*: Primary qualities (effectual aspects) and secondary perception (symbols in the mind) *Nature of time*: Schematic time as location (linear and dimensional)
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

Source(s): Authors' work

The *theory of truth* for each work hypothesis is a logic of cognitive criticism. Dispersive theories are strong in scope in corroboration, but weak in precision (i.e. evidence is not well connected due to indeterminism or vagueness). Analytic theories are strong in precision in corroboration, but weak in scope (i.e. evidence that might be included is ignored or called "unreal").

Categories are "those concepts which most clearly and economically characterize a world theory, and differentiate it from other world theories" (Pepper, 1947, p. 555). Universal categories don't exist, because it is the distinctions between world theories that make them useful.

The *nature of time* is implicit with each root metaphor. Explicitly focusing on temporality in each of the four world hypotheses surfaces whether time comes to the foreground, or remains in the background.

Formism as a root to an organizational systems theory presumes a universal ideal feature that instances would aim to emulate. Thus, an organization might eye the annual leave privileges in France of 36–48 days of vacation and public holidays, or parental leave in Finland of 320 days. From an analytical perspective, the isolated "best practices" don't necessarily have to add up.

Mechanism as a root to an organizational systems theory has been common with industrialization. The presumption that human beings can be programmed in the same was as machines is at the foundation of most employee incentive schemes.

Contextualism as a root to an organizational systems theory closely relates to the SES perspective. It would easily be recognized by individuals in business development roles. Closing a deal can be a historic event, where the months or years of relationship-building and negotiations aren't obvious.

Organicism as a root to an organizational systems theory closely relates to the STS perspective. This is common in production and manufacturing predispositions, such as launching a new product. It's ready when it's ready. Rushing out an incomplete offering before its time can lead to a negative reputation by early adopters that inhibit acceptance when wider availability is attainable.

From these examples, it's clear that one root metaphor is not superior to another. A shock such as the pandemic disruption might cause an organization to change from one root metaphor to another. Heeding the maxim that eclecticism is confusing, if none of the four original world hypotheses was considered sufficient, a new one could be constructed.

3.4 (Con)textural dyadic thinking modifies contextualism with yin qi + yang qi

Contexture has an etymology tracing back to the 1600s, defined in the *Oxford English Dictionary* as "the action or process of weaving together or intertwining; the fact of being woven together; the manner in which this is done, texture". The label has been used for a branch of action research, where the system of interest is interorganizational rather than focused on a single organization.

> Contextural action research . . . focuses on the facilitation of participants as generators of change collaborating in a cooperative, self-learning venture. This style of research is less concerned with the intraorganizational expression of organizational change theory than with the change capacities of multi-organizational systems. Contextural action research engages participants from the range of interests associated with a particular metaproblem to *learn with and from each other* (Franklin, 1998, pp. 47–48).

The lineage of systems thinking in organization is an evolution of the *contextual action learning methods* influenced by Eric Trist with the *Action Learning Group* at York University in Toronto 1978–1983 (Carvajal *et al.*, 1994; Morley, 1989) with the SES perspective.

That tradition from the 1980s was picked up again in 2019, when the *Systems Changes Learning Circle* began (Ing, 2022). Five years of research have led to a proposal to modify contextualism into a new world hypothesis called *contexturalism-dyadicism*. Towards reducing confusion with contextualism, an emphatic articulation of (con)texturalism-dyadicism has been adopted.

(Con)texturalism aims to retain ties to historical 20th-century development in the systems sciences, complemented with 21st-century advanced in ecological anthropology (that is, meshwork (Ingold, 2011)), contextual-dyadic thinking (Lee, 2017a), yinyang in Classical Chinese Medicine (Lee, 2017b; Maciocia, 2015) and Euro-Chinese philosophy (that is, efficacy (Jullien, 1995)). While the temporality in process philosophy (for example, Alfred North Whitehead), and rhythms of strategy (Omidvar *et al.*, 2022), is acknowledged, consideration of living systems places rhythms into the foreground.

Dyadicism with (con)texturalism, through an implicit Chinese philosophy of science, can be contrasted to dualism in Western philosophy where context is abstracted away.

> Dualism implies permanence, as it is context-independent . . .. Under dyadism, as it is context-dependent, men are superior to women in certain contexts such as, in general, possessing greater physical strength, while women, in general, are superior to men, for example, in grasping nuances in emotional relationships . . .. Inherent inferiority or inherent superiority is not part and parcel of dyadic but only of dualistic thinking (Lee, 2017a, pp. 224–225).

Science based on a Chinese implicit dyadic ontology defines the myriad (i.e. countless) happenings (that is,. *wanwu*, translated as ten thousand things) in contrast to Western philosophical distinctions of matter and energy. *Qi* is basic ontological category accounting for *wanwu* in life, in a processual view of the dyadic transformations of yang (as immaterial) from/to yin (as material). In an interpretation from the *Zhuangzi*:

> *Qi* was capable of two modes of existence or being . . .. These two modes of being may be called: (a) *Qi*-in-concentrating-mode (*qi ju* / 气聚); (b) *Qi*-in-dissipating-mode (*qi san* / 气散). [. . ..]

> These two modes of being are inter-related, inter-transformable. As already indicated, "inter-transformable" means that *Qi*-in-dissipating mode can become *Qi*-in-concentrating mode, and after a period of time, *Qi*-in-concentrating mode returns as *Qi*-in-dissipating mode, thereby setting up a cycle of sustainable exchange between the two modes (Lee, 2017b, pp. 42–43).

Yin and yang are inextricably entwined with each other, causally and ontologically, into a whole. The main features of this interpretation of the philosophy of Chinese thinking can be summarized:

(1) *Qi* is the basic ontological category with two modes of existence – *Qi*-in-dissipating mode and *Qi*-in-concentrating mode with the former transforming itself into the latter, the latter changing into the former in cyclic reversions.

(2) *Qi* is divided into *yin qi* and *yang qi*; and the relationship between them is represented as *Yinyang*.

(3) *Yin qi* and *yang qi* in reality do not and cannot exist in their respective pure states, but in varying degrees of *yin*-in-*yang* and *yang*-in-*yin*.

(4) Reality is about change in the complex manner set out in 1 through 3 above (Lee, 2017a, p. 261).

Yin qi and *yang qi* are naturalistic and processual to living systems, and foundational in classical Chinese metaphysics.

A processual systems approach with an ecological perspective observes (i) changes in yinyang in a body, alongside (ii) changes in yinyang in the natural world. In the yinyang relationship in a living being,

> *Yin* is the structure (*ti* 體), and *yang* is the function (*yong* 用). *Ti* as *yin* refers to the tangible parts of the body . . .. *Yong* as *yang* refers to the abilities to act and transformational activities. Both structure and function are tied together to maximize different bodily capacities (Wang, 2012a, pp. 172–173).

Taking a processual systems orientation, *Qi*-in-dissipating mode is *functioning*, and *Qi*-in-concentrating mode is *structuring*. A living system co-responds with the natural world that itself is both functioning and structuring, with cycles of waxing and waning (e.g. waking and sleeping).

Stepping outside the constraints of Western philosophy, a new world hypothesis of (con)texturalism-dyadicism is offered with the root metaphor of yinyang dancing through [eight] seasons. The dualism of (i) dissipative manner in contextualism and (ii) integrative manner in organicism is dissolved in Table 3 below. (Con)texturalism-dyadicism is a synthetic mode that embraces both the dissipative manner and integrative manner.

The dyadicism of "yinyang dancing" is expressed as "((*yin qi*) $\propto$ 1/(*yang qi*)) wayfaring". The mathematical symbol $\propto$ is not an alpha, and should be read as "is proportional". *Yin qi* and *yang qi* are inversely proportional, that is, *yin qi* increases as *yang qi* decreases, and vice versa. *Wayfaring* describes "the embodied experience" of moving, in contrast to destination-oriented transport (Ingold, 2011, pp. 149–150). *Unfolding* is sequentially generative in a process of development in "an order in which things are introduced" (Alexander *et al.*, 2005, p. 3), yet not deterministic. A simile for yinyang dancing is a couple engaged in ballroom dancing together.

The (con)textualism of "[eight] seasons" is expressed an unfolding *wanwu* [concentrating $\rightleftharpoons$ dissipating] texture. The right-left harpoon arrows ($\rightleftharpoons$), normally used to denote equilibrium in chemistry, is borrowed for the feature of reversibility of concentrating alongside dissipating. The textures are composed of myriad (countless) temporal strands, and are rhythmically cyclical.

While the seasons of the year are commonly expressed as four (i.e. winter, spring, summer, autumn), the binary dyadic taken to the third power counts to eight seasons. Unfolding, as an adjective, can be defined as disclosing or developing. *Wanwu* is the mutual transformation between *qi*-in-concentrating mode and *qi*-in-dissipating mode; materializing and immaterializing; birthing and dying, or originating and decaying. The lining up of natural rhythms in (con)texturalism recognizes irregularities and the specious present in

Table 3. Dispersive and integrative manners with (con)texturalism-dyadicism [CC-BY David Ing]

World Hypothesis	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	**Organicism** *Root metaphor*: Constructive development, with orderliness of changes from stage to stage
	Theory of truth: Operationalism, via qualitative confirmation of solving a specific problem	*Theory of truth*: Coherence, where fragments cohere with their nexus, free of contradiction
	Categories: Strands, texture, quality, novelty	*Categories*: Progression (steps), final outcome (ideal)
	Nature of time: Qualitative duration, event relative to a specious present	*Nature of time*: Directional arrow, successive integrations

	Dispersive + Integrative manner for organizing evidence
Synthetic mode of reasoning	**(Con)texturalism - Dyadicism** *Root metaphor*: Yinyang dancing through [eight] seasons, as ((*yin qi*) $\propto$ 1/(*yang qi*)) wayfaring in unfolding *wanwu* [concentrating $\rightleftharpoons$ dissipating] textures
	Theory of truth: Entailment, traceability back through history, with anticipated outcomes indetermined
	Categories: Rhythmic shifts, (con)texture, propensity
	Nature of time: Kairotic, with propitious periods and inopportune periods

Source(s): Authors' work

contextualism. The constructive development in dyadicism is orderliness in changes, in the synchrony of successively progressing towards a complete journey.

The *nature of time* in *(con)texturalism-dyadicism* is *kairotic*, rather than *chronotic*, with propitious times and inopportune times. Simply, *kairos* is qualitative duration as felt time; *chronos* is clock time. More formally: "*Chronos* is 'the chronological, serial time of succession, . . . time measured by the chronometer not by purpose". *Kairos* is the 'the human and living time of intentions and goals . . . the time not of measurement but of human activity, of opportunity" (Orlikowski and Yates, 2002, p. 686). In these world hypotheses, both are eventful moments or durations of time. (Con)texturalism places an event in its specious present of rhythms. Dyadicism sees propitious periods and inopportune periods coming and going in a directional arrow of time.

The *theory of truth* of *(con)texturalism-dyadicism* is *entailment*, a traceability back through history, with anticipated outcomes indetermined.

> "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).

(Con)texturalism allows tracing an outcome back through entailments, without forward-looking causality, for example, the existence of a child entails parents, but a couple marrying doesn't necessarily cause children. A general systems predisposition appreciates the teleonomy in biology (Mayr, 1988), as an alternative to teleology. Dyadicism has a coherence in continuing processual eurhythmia, where living systems have the capacity to overcome through temporary arrhythmic periods of incoherence.

Categories for *(con)texturalism-dyadicism* include rhythmic shifts, (con)texture and propensity. The categories of contextualism have parallel expressions in contemporary research: strands extending over time might be called lines (lifelines), threads or traces (Ingold, 2007). *Texture* might be associated with meshworks (Ingold, 2011), knots (Ingold, 2015) and co-respondences (correspondences) (Ingold, 2016). (Con)texturalism recasts the temporality of significant events as rhythmic shifts in living systems. Dyadicism weaves pairs of strands together into texture; and texture can interweave with other textures as contexture to the strands. *Propensity* is a predisposition related to the arrangement of things, in a non-causal way (Jullien, 2004; Jullien, 2015). (Con)texturalism-dyadicism appreciates propensity when novel circumstances can come together, and progression towards eurhythmia or arrhythmia, rather than idealism.

The categories of rhythmic shifts, (con)texture and propensity in (con)texturalist-dyadicism are shown to extend the STS and SES perspectives for the world of work in Section 4, next.

4. A (con) textural-dyadic world hypothesis gains adequacy to become a theory

As systems theories, both the SES perspective and the STS perspective were premised on action by purposive, goal-seeking agents. Following a western philosophical tradition, the move towards contextualism unfortunately retained some of its organicist predisposition. This shows up in the seminal 1965 article:

> . . . L indicates some potentially lawful connection, and the suffix 1 refers to the organization and the suffix 2 to the environment:
>
> L_{11}, L_{12}
>
> L_{21}, L_{22}
>
> L_{11} here refers to processes within the organization – the area of internal interdependencies; L_{12} and L_{21} to exchanges between the organization and its environment – the area of transactional interdependencies, from either direction; and L_{22} to processes through which parts of the environment become related to each other – i.e. its causal texture – the area of interdependencies that belong within the environment itself (Emery and Trist, 1965, p. 22).

Connection L_{11} is a STS perspective. Connection L_{22} is a SES perspective. Connection L_{21} is the SES affecting the SES. Connection L_{12} is the STS affecting the SES. Into the 21st century, this stream of research has continued as causal texture theory (Ramirez *et al.*, 2008).

Citations in Emery and Trist (1965) base STS and SES as derived from causal texture in organisms from two psychologists, American and German (Tolman and Brunswik, 1935). Egon Brunswik migrated to Berkeley in 1935, and attributed the term "texture" as originating from Pepper, who was just publishing his first work on Root Metaphor Theory (Pepper, 1935). Acknowledging the process philosophy of Alfred North Whitehead, which developed following René Descartes and Sir Isaac Newton (Whitehead, 1929), an alternative complete metaphysics in available from a non-Western tradition. In a history of philosophy of science, C. West Churchman was a key figure in the systems movement who was open to Classical Chinese philosophy (Hammond, 2003, p. 13). Churchman acknowledged the *I Ching* as the "earliest document aiming at a systems approach to decision making" (Churchman, 1979, p. 32).

(Con)texturalism-dyadicism is compatible with *The Book of Change*s, dating back to the Western Zhou period (1046 BCE - 256 BCE). (Con)texturalism is better expressed in the *I Ching* (Legge, 1899; Wilhelm, 1950), now known as the *Yi Jing* (Minford, 2014). Dyadicism is more prominent in *yinyang*, foundational in the science and practice of Classical Chinese Medicine. From the ancient Chinese medical text *Huangdi Neijing*, a concise English language interpretation of *yinyang* provides some insight into foundations not only in biology, but in more broadly in metaphysics.

All internal bodily functions are the work of yinyang, according to at least three variables:

(1) The rhythm of yinyang (*jiezou* 節奏): either yang or yin is too fast or too slow;

(2) The balance of yinyang (*pingheng* 平衡): too much or too little yang or yin; and

(3) The transformation of yinyang (*bianhua* 變化): yang or yin changing too much or too little (Wang, 2012b, p. 22).

A stronger interpretation of *bianhua* (變化) as change (*bian*變) combined with transformation (*hua* 化) requires "you renew yourself entirely from within" rather than just adapting or modifying a response to a situation (Jullien, 2004, p. 178). A dyadic strand, in a philosophy of body, is presumed to be a living, self-regulating system that is mostly capable of dealing with ailments. Treatment in Classical Chinese Medicine is based on "certain methodological rules derived from theory such as when *qi* is blocked, it causes pain/不通则痛/*bu tong ze tong*; and that treatments such as acupuncture, *tuina*, and decoction can eliminate a blockage and thereby the pain" (Lee, 2018, p. 45). Self-healing of the system via internal adjustments is preferred over invasive interventions (e.g. surgery) initiated externally.

A (con)textural-dyadic approach features the advantage of a theory within a single autonomous World Hypothesis, of (1) each worker with the yinyang of a personal livelihood and a personal lifestyle; in (2) a corporate commercial enterprise alongside other institutions. The pandemic disruption can be likened to a (con)texture of an unexpected and long winter with heavy snowfalls that impedes life for individuals and for organization. Each of the three conditions of (1) rhythmic pacing, (2) dyadic balancing, and (3) transformative reifying, is explicated in the sections that follow.

4.1 Slowing in rhythmic pacing might entail late spring or permanent climate change

The effect of the COVID-19 pandemic from 2020 was like the whole planet Earth being struck by an unexpected and severe unseasonal winter. The constructive rhythmic pacing of work (a dyadic strand) can be portrayed in as a pandemic world in which yin (i.e. material process) slowed. Rhythm as dyadic means that when yin slows, yang (i.e. immaterial process) should also naturally slow. Concretely, when the replenishing of goods and services slowed down, sustainability required reduction of demands towards essentials. People used to living in four seasons have come to expect shutdowns from blizzards, and look forward to warmer times. The COVID-19 slowdowns impacted workers and enterprises to varying degrees. By late 2022, it seemed as though we were not entering another Ice Age, and spring would return.

Two (non-exhaustive) rhythmic paces in work can be brought to attention: (1) workers, in the contexture of employment systems and family systems; and (2) enterprises, in the contexture of supply chains and governments.

Workers shut out of their physical workplaces, in the metaphorical winter, were slowed on getting work done, at least initially. Many employees of large corporations were sustained at salary levels for full office hours as before, even with lower productivity. Most impacted were customer service agents providing in-person, face-to-face transactions on restricted hours, with only selected venues open. Employers who had already established WfH practices more readily ramped up high-speed cloud computing, instant messaging and web conferences.

Enterprises, in the metaphorical winter, became snagged in just-in-time supply chains, just as deliveries are delayed during a blizzard. Unloading cargo ships was curtailed; air freight traffic was reduced. Manufacturers were unable to fully assemble products, with delayed parts and shortages of computer chips. In some countries, governments provided bridge funding for employers, while others provided direct payments to employees. Enterprises lost some providers, some customers and even some funders. Employers may have laid off some employees.

Metaphorical spring for workers may have been co-related with schools returning to in-person learning. For workers offered the option to resume or return to jobs with employers before, temporary accommodations for continued WfH may have been put into place. For those whose employers did not survive the pandemic disruption, metaphorical winter continued.

For enterprises that survived to see a metaphorical spring, failures of extended offshore supply chains have opened up opportunities for investment in domestic production.

Companies could see spring as an opportunity to increase prices, after a winter when they might have been accused of profiteering.

The rhythm of yinyang as too fast or too slow is the first of three systems variables. The balance of yinyang, described in the next section, may be the systems variable most familiar to those not immersed in Chinese science.

4.2 Dyadic imbalance might entail recuperation from acute injury, or chronic illness

In a healthy system, yin and yang work together in mutual self-adjustment. Thus, more rest enables more work, and less rest draws down capacity for work. A living system is, however, open to seasonal transitions, to winter and to spring. Illness results from an imbalance of yin relative to yang, either as deficient or excess in one or the other. Imbalances come from external pathogenic factors and internal endogenous factors, with the former potentially penetrating the latter (Wang, 2012a, pp. 176–177). For conciseness, a balanced yinyang dyadic and four imbalanced yinyang are depicted in Figure 1 below.

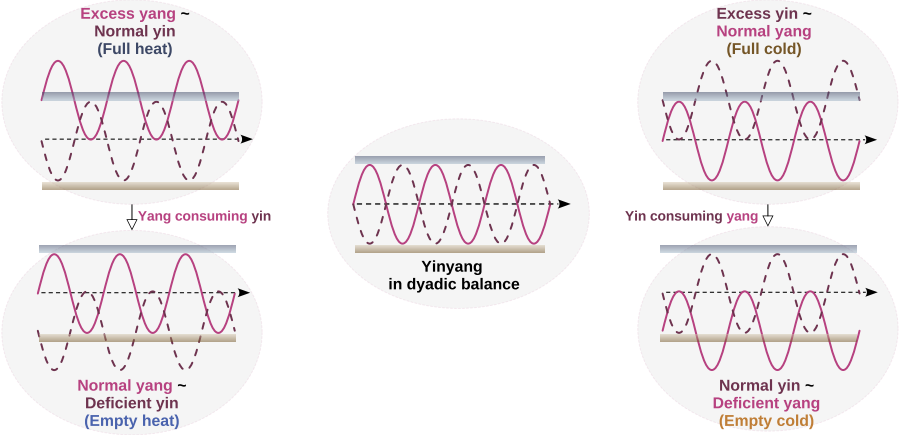
Yin and yang are dyads in time, as parallel and complementary processes. In the human body, maximum yang is attained at noon, and maximum yin is attained at midnight.

Dyadic balance means that *yang qi* (i.e. functioning, *qi*-in-dissipative mode) is sympathetically responsive to *yin qi* (i.e. structuring, *qi*-in-concentrating mode). In the contexture of a social system with stakeholders, *yang qi* might be represented as front stage activities serving customers, with *yin qi* as backstage activities provisioning performing.

Full heat is a case where, at noon, excess *yang* and normal *yin* would be observed. As daytime progresses to nighttime, *yang* consumes *yin*. This results, at midnight, in the case of empty heat with normal *yang* and deficient *yin*. A more precise prognosis by a skilled Chinese doctor would choose between clearing *yang* and nourishing *yin*.

Full cold is a case where, at midnight, excess *yin* and normal *yang* would be observed. As nighttime progresses to daytime, *yin* consumes *yang*. This results, at noon, in the case of empty cold with normal *yin* and deficient *yang*. A more precise prognosis would choose between expelling *yin* or tonifying *yang*.

The pandemic disruption, as an unanticipated metaphorical winter, would most impact systems as (1) full cold, or (2) empty cold cases. In a social systems contexture, this could be interpreted as (1) excess structuring with normal functioning, or (2) normal structuring with deficient functioning.



Source(s): Authors' work

Figure 1. Cases of yin + yang in dyadic balance, excess yang, deficient yin, excess yin, deficient yang [CC-BY David Ing]

Workers most at risk in unanticipated metaphorical winter in the contexture of an employment system would be either (1) overstaffed while serving customers adequately, or (2) adequately staffed while serving customers deficiently. In the contexture of a family system, high risks could be (1) low job mobility with typical generational responsibilities, or (2) adequate job mobility with heavy generational responsibilities.

Enterprises most at risk in unanticipated metaphorical winter in the contexture of supply chains would be either (1) inventory-dense with normal customer demand, or (2) inventory-moderate with inadequate customer demand. In the contexture of a government system, high risks could be (1) dense regulation with typical government support, or (2) moderate regulation with deficient government support.

For either system, restoring dyadic balance would involve either (1) expelling some structuring (e.g. losing some bulk) while maintaining function, or (2) tonifying functioning (e.g. serving stakeholders better) for the continuing pace of structuring. If this rebalancing was not done in the winter, the excess *yin* internally would be a further challenge in the spring when *yang qi* increases seasonally.

In a living system, restoring dyadic balance internally is an incremental everyday experience. In the next section, the third of three systems variables, transitions between the longer stages of life, are described as transformative reifying.

4.3 Delayed transformative reifying might entail stunted or delayed life transitions

Sciences on living systems, including Chinese medicine, recognize transitions in life stages, for example, from childhood to adolescence to adulthood. Social rhythms conventionally wrap around them.

Workers going through life transitions during the metaphorical winter of the pandemic disruption could passively accept the circumstances or take proactive action. Since human beings can exercise will, they are able to redirect the strands of their lives, and potentially attach to a new contexture.

Enterprises entering the metaphorical winter could experience either boom or bust. The longer the metaphorical winter endured, the more companies eventually downsized their businesses.

In the spring of pandemic recovery, the need for workers in building and supporting apps has declined, as technologists are moving away from startups to more established employers. Families have returned to a prior normalcy, with resistance to reverting Work-for-Home programs resulting in hybrid compromises.

Businesses and governments have been unable to turn the clock back to the pre-pandemic area.

Transforming a system during winter is hard. The mere turn of seasons from winter to spring holds promise, but roots that have been damaged during winter may never fully recover.

4.4 (Con)textural-dyadicism joins the four historic world hypothesis as theory-building

With a new (con)texturalism-dyadicism more fully described, contrasting theories can be inferred on the nature of work, and effects of disruption, summarized in Table 4 below.

Formist theories of work based on a root metaphor of similarity essentially treat all jobs mostly as the same. The hypothesized nature of work sees job markets as efficient, so that jobs as be picked up and discontinued casually. The effects of disruption suppose that demand and supply each can fluctuate, and equilibrium may settle at some higher or lower level.

Mechanicist theories of work based on a root metaphor of machine hypothesize work sees with roles can be clearly defined, with requirements fulfilled by qualified candidates. The effects of disruption suppose that operations can be suspended and restarted, restoring function by components properly maintained. This class of theories is appropriate for routinized activities, where procedures are easily specified and staff can be trained in hours or days.

Contextualist theories of work are based on the root metaphor of situation hypothesize work as projects with defined scopes chartered with teams towards goals that are met (or not). The effects of disruption suppose that initiatives suspended might be abandoned, or reconstituted under another identity.

Table 4. World hypotheses for theories of work [CC-BY David Ing]

World Hypothesis	Dispersive manner for organizing evidence	Integrative manner for organizing evidence
Analytic mode of reasoning	**Formism** *Root metaphor*: Similarity	**Mechanism** *Root metaphor*: Machine
	Hypothesized nature of work: Job markets are efficient, roles can be picked up and discontinued casually	*Hypothesized nature of work*: Roles can be clearly defined, with requirements that are filled by qualified candidates
	Effects of disruption: Demand and supply can each fluctuate, and equilibrium may settle at a higher or lower level	*Effects of disruption*: Operations can be suspended and restarted, with function restored by properly maintaining components
Synthetic mode of reasoning	**Contextualism** *Root metaphor*: Situation	**Organicism** *Root metaphor*: Constructive development
	Hypothesized nature of work: Projects are chartered with teams towards goals that are met (or not)	*Hypothesized nature of work*: Lifetime careers, from novice through promotions to maturity, and then lateral adaptation
	Effects of disruption: Initiatives suspended might be abandoned, or reconstituted under another identity	*Effects of disruption*: Delayed or deferred advancement, remediation to attain defined standards

	Dispersive + Integrative manner for organizing evidence
Synthetic mode of reasoning	**(Con)texturalism – Dyadicism** *Root metaphor*: Yinyang dancing through [eight] seasons, as ((*yin qi*) $\propto$ 1/(*yang qi*)) wayfaring in unfolding *wanwu* [concentrating $\rightleftharpoons$ dissipating] textures
	Hypothesized nature of work: Individuals each synchronizing livelihoods with lifestyles, woven into economies with cultures
	Effects of disruption: Adapting to changes of season, or reifying to a new (sub)world

Source(s): Authors' work

Organicist theories of work are based on a root metaphor of constructive development, where the hypothesized nature of work sees lifetime careers, from novice with promotion to maturity, and then lateral adaptation. The effects of disruption suppose delayed or deferred advancement, with potential remediation to attain defined standards.

(Con)texturalist-dyadicist theories of work are based on a root metaphor of yinyang dancing through [eight] seasons sees the hypothesized work as individuals each synchronizing livelihoods with lifestyles, woven into economies with cultures. Effects of disruption suppose adapting to changes of season, or reifying to a new (sub)world.

These five classes of theories of work are not intended to be exhaustive. The COVID-19 pandemic has, however, impacted different classes of work in different ways. Students who were enrolled in colleges and universities during the COVID-19 pandemic presuming an organicist career path may have gaps in occupational knowledge or skills that need to be filled in. Project-based workers on contextualist paths who were laid off during pandemic slowdowns may decide that the ups-and-downs of contract work are not worth the stress of not having a steady paycheque. Rising stars in popular culture or professional sports in the (con)textural-dyadic mode may have to choose between living to work, and working to live.

5. Conclusions: inquiry into changes in the world of work opens a fresh perspective on systemic changes

In 1936, Albert Einstein wrote: “What does a fish know about the water in which he swims all his life”? So it is with work. Human society is so immersed in work that the average person could question why a theory on the topic would be valuable. The disruption to work, as part of our lives during the COVID-19 pandemic slowdown, surfaces the opportunity to deepen our understanding.

The purpose of this research article has been to explore ways in which a systems-theoretic view of work might deepen our understanding of its nature.

The current generation of leaders, in government and business, might argue that the COVID-19 pandemic disruption was unprecedented, with uncertainty following the resumption of work. Historians with a longer horizon might refer back to the Black Death of bubonic plague from 1346 CE to 1353 CE that claimed the lives of 50 million people. That plague occurred before Columbus discovered the New World, in agricultural economies before the Industrial Revolution.

The resurfacing of Root Metaphor Theory and proposal of a (con)textural-dyadic world hypothesis opens up explorations beyond social theory (i.e. the philosophy of sociology) to other complementary branches, such as the philosophy of science. Disruptions to work such as with COVID-19 may be alternatively expressed with a theory of changes derived from the Eastern Zhou dynasty (771-256 BCE) and Warring States period (475-221 BCE), that predate even pre-Socratic philosophers. A constructivist philosophy expands systems theories beyond the social, to an onto-epistemology of Classical Chinese thought.

An approach that puts systems changes into the foreground pushes more familiar conventions on incremental (re)structuring into the background. Under pandemic disruptions, even the healthiest businesses were not immune to conditions outside their control. The inquiry into systems changes led to organizational theories associated with contextualism, which then led to process philosophies. The metaphilosophy of World Hypotheses not only underpin multiple alternative classes of theories, but also gave structure towards developing a new class on which adequacy could be judged.

The major finding from this inquiry is that a singular theory of work is insufficient. Theories of work can, however, be classified by their underlying World Hypotheses. Pre-pandemic workers operating on *formist* theories with a root metaphor of *similarity* could make a living by picking up casual jobs. In the post-pandemic resumption, the report of the Great Resignation suggests that demand for casual workers has returned, but prior employees have may have retired or retrained into a different class of work. Formist employers relying on minimum-wage labour have either to automate further, or consolidate storefronts or offices to make do with the available workforce. Pre-pandemic workers operating on *mechanicist* theories with a root metaphor of *machine* were mostly skilled workers. Pre-pandemic workers operating on *contextualist* theories with a root metaphor of *situation* tended to have more experience with projects and contracts starting, ending, and with transitions, to move on. Pre-pandemic workers operating on the *organicist* theories with a root metaphor of *constructive developmen*t were retarded in professional or career progression for one or two years.

Theories of work in the (*con)textural-dyadic* class have a root metaphor of yinyang dancing through [eight] seasons. This mindset balances worklife and lifestyle, not in the industrial mode, and includes agricultural and family small businesses. The possibility of post-pandemic resumption of work depends on reserves that might have been drawn down from shutdowns, and fatigue from frustrations of operating at a small scale.

The research implications of centering on world theories, towards which the World Hypotheses aspire, returns the focus on social systems back to larger non-social influences. In the World Hypotheses framing, the new categories – of rhythmic shifts, (con)texture, and propensity – are sufficiently different from the more familiar mechanistic and organicist metaphors that making the new theory intuitive is an immediate challenge. Even the

contextualist approach – where context is often parsed incorrectly as "text" rather than "texture" – has been misunderstood. Educating practitioners on prioritizing temporality (as an antecedent to rhythm) in systems runs counter to the conventional definition of system with boundary.

Future directions for (con)textural-dyadic theories will involve further investigations of Classical Chinese philosophy of science, in the spirit of General Systems Theory. Yinyang is foundational in Chinese metaphysics, and so has been applicable with biological systems, social systems and ecological systems.

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