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Psychodynamics Correspondences to World Dynamics

Revision by AI of 48 variables from World3 system dynamics model of 1971

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This is a revision of a portion of *World Dynamics and Psychodynamics* (1971), indicated then as a step towards making abstract "world system" dynamic limitations meaningful to the individual. As revised below by Claude-4.7, it as an indicative exercise forming an annex to *World dynamics and psychodynamics polyhedrally framed* (2026) — to evoke debate, rather than be definitive.

Introduction

An early speculative exercise explored the correspondences from a general systems perspective between the variables of "world dynamics" identified by Jay Wright Forrester (*World Dynamics*, Wright-Allen Press, 1971) and "psychodynamics" (*World Dynamics and Psychodynamics* (1971). The 48 variables of what became known as the World3 model served as the initial basis for the work on the influential *Limits to Growth* (1972) study promoted by the Club of Rome. The World3 model has been subject to only relatively minor upgrades since then. There is no World4 model.

The exploratory use of AI in the memorable visualization in 3D of such dynamics -- specifically the variables of the World3 model -- suggested a revision by AI of the potential correspondences originally indicated (*World dynamics and psychodynamics polyhedrally framed*, 2026). As discussed there, the revisions now feature in the representation of the 48 variables on a truncated cuboctahedron and on its interactive variant using the X3DOM protocol.

As indicated in that separate discussion, it is especially striking in 2026 that the "psychodynamic dimensions" totally absent from the "world dynamics " perspective in 1971 -- and since that time in the World3 model -- are of major concern in 2026 in the role of public opinion, social media, censorship, propaganda, misinformation, narrative manipulation and control. This is associated with the total erosion of trust underming the viable implementatation of any strategy or the articulation of "world models" by experts. Insights from the complementarity between quantitative material considerations and intangible psychosocial considerations was also highlighted visually in a 30-fold adaptation of the 15 global strategic challenges identified by the Millennium Project (*Transcending*

the wicked problem engendered by projecting negativity elsewhere, 2015).

Framing the psychodynamic revision with AI

Show/Hide All AI Responses

Question to Claude-4.7: With respect to the psychodynamic text from 1971, and its comparison from a general systems perspective with the world dynamics text, could you review the original to see whether the language included in the 3D model could have been improved. ***[Show/Hide AI response]***

Question to Claude-4.7: A principal concern is (again from a general systems perspective) that some weaknesses derive from inadequate creativity (in 1971) in cases where more insight could now provide alternatives -- rather than simply editing down the original version. There is of course a strong case for including the revised sentences in the 3D model under construction. ***[Show/Hide AI response]***

Question to Claude-4.7: There is no need to give new space to the 1971 versions which are readily accessible either in the writeup or the X3DOM. The revisions could be flagged when significant amendments have been made. ***[Show/Hide AI response]***

Question to Claude-4.7: You have been respectful of "Forrester 1971" where the emphasis was on "World3" -- which seemingly has not been extensively updated. It is appropriate to offer pointers to contemporary advances, which might be presented in italics. There is a confusion between the 5-fold set of sub-systems of World3, the 8 you mention and a further 12 mentioned elsewhere. Maintaining the correspondence with the original code listing is appropriate. This is an indicative exercise. ***[Show/Hide AI response]***

Question to Claude-4.7: Given that World3 is a resource management model in many respects, AI is especially articulate on issues like cognitive load, memory, information overload, complexity, information access, IP, and the like. To what extent could that have inspired any treatment of cognitive resources in your adaptation. ***[Show/Hide AI response]***

Question to Claude-4.7: The response is most justified and worth noting explicitly. My sense is that, rather than revise text to reduce the bias of which you are aware, there is a case for adding remarks in each case reflecting alternative perspectives. As I noted, the exercise is indicative -- to evoke debate -- and in no way purports to be definitive. In designing the table, the only justification for a lengthy World dynamics column is because of the lengthy of the Psychodynamics text -- otherwise it could hav been much shorter. It might even be the case that the former has ben "tweaked" in the literature with its own amendments which might have been indicted in italics. ***[Show/Hide AI response]***

Question to Claude-4.7: Clear. Only add where useful. Tweak World3 when points have been made. On the X3DOM, it might be relatively easy to offer 3 modes: with World Dynamics AND Psychodynamic sentences, the first only, or the second only. ***[Show/Hide AI response]***

Psychodynamic revision by AI

World3 column gives variable name and unit. Italic pointers mark later-literature reinterpretations of the variable.

Psychodynamics (2026) column gives a revised reading. Italic fragments are pointers to contemporary frameworks (cognitive-science register). Where a substantive contrast is available, an *alternative reading* in a constitutive / hermeneutic / depth-psychological register is appended.

Edit flag: **TIGHTENED** sharpens prose without altering the mapping; **RECONSTRUCTED** substitutes a substantively different reading; **+ ALT** indicates an alternative reading is present. Blank cells in the 1971 source (CIDN, NRUN, NRUR) are reconstructed by default.

The cognitive-science vocabulary of the primary readings reflects where contemporary academic discourse — and AI training corpora — concentrate. The alternative readings point to less densely represented but equally contemporary registers in which the same variable can be read differently.

#	Code	World3	Psychodynamics (2026)	Edit
1	**P**	Population	Stock of distinguishable mental contents — concepts, beliefs, facts, hypotheses, memories — held by a person at a given time. *cf. content of long-term memory; declarative knowledge base.* *Alternative reading.* What a person holds is not best modelled as a stock of discrete items. A constitutive reading takes the mental population as the sedimented meanings, attachments and concerns that constitute a particular life. *cf. lifeworld (Husserl, Schutz); sedimentation in phenomenology; what one cares about (Frankfurt).*	**TIGHTENED + ALT**
2	**BR**	Birthrate (people/year) *Demographic transition literature has refined the rate around the fertility-transition model.*	Rate of generation of new mental contents per unit time — ideas formed, hypotheses entertained, beliefs adopted. *cf. cognitive generativity (Boden 1990); divergent thinking; conceptual combination.* *Alternative reading.* What counts as a *new* idea is itself a constitutive question: a new arrangement of old material, an insight into what was already implicit, or a genuinely new commitment that reshapes what came before. The rate metaphor handles the first two; the third is harder. *cf. insight as transformation (Gadamer); kairos vs chronos.*	**TIGHTENED + ALT**

#	Code	World3	Psychodynamics (2026)	Edit
3	**DR**	Death rate (people/year)	Rate at which mental contents fall into functional disuse. Unlike biological death this is rarely permanent; with appropriate cueing the content can re-enter active use. *cf. forgetting curves (Ebbinghaus and successors); transient versus persistent forgetting; cued retrieval.*	**TIGHTENED**
4	**BRN**	Birthrate normal	Baseline rate of new-content generation in absence of unusual stimulus or suppression — the resting creativity rate. *cf. trait-level openness to experience; baseline curiosity.*	**TIGHTENED**
5	**DRN**	Death rate normal	Baseline rate at which mental contents fall into disuse absent unusual pressure or stimulus. *cf. natural-forgetting rate; rehearsal-independent decay.*	**TIGHTENED**
6	**PDN**	Population density normal (people/km²)	Reference packing density — how many distinguishable contents normally occupy a given quantum of mental space. *cf. working-memory capacity limits (Cowan 4±1); chunking; conceptual granularity.*	**TIGHTENED**
7	**CR**	Crowding ratio	Pressure that arises when content density exceeds the mind's organisational capacity — information overload, competition between contents for attention. *cf. cognitive load theory (Sweller); information overload; attention as bottleneck.* > *Alternative reading.* Crowding can be read constitutively as a loss of *room to be* — not bandwidth saturation but loss of the empty space necessary for unforced thought and silence. *cf. contemplative traditions on emptiness; Byung-Chul Han on burnout society.*	**TIGHTENED + ALT**

#	Code	World3	Psychodynamics (2026)	Edit
8	**LA**	Land area (km²)	Total mental workspace available to hold concepts, beliefs and other contents. Bounded by cognitive architecture, though the effective capacity expands with structuring (categories, schemas, expertise). *cf. cognitive workspace; expert chunking; mental models as space-extenders.* *Alternative reading.* The space metaphor is itself contested: mind may not be primarily container-shaped. Extended-mind and ecological readings dissolve the inside/outside distinction, locating cognition in the loop with environment, tool and other. *cf. extended mind (Clark & Chalmers); ecological psychology (Gibson); 4E cognition.*	**TIGHTENED + ALT**
9	**CI**	Capital investment *Later literature distinguishes industrial capital (more resource-intensive) from service capital (less so); the World3 single-sector treatment is a simplification.*	Accumulated stock of established habits, routines, mental models and conceptual frameworks — the durable structures into which sustained mental effort has been organised. *cf. habit formation (Wood & Neal 2007); cognitive scripts (Schank-Abelson); mental models (Johnson-Laird); automaticity (Bargh).* *Alternative reading.* Commitment as formation rather than accumulation — what one has *become* through sustained engagement, rather than what one has *stored*. The information-processing framing treats self as having structures; a constitutive framing treats self as constituted by its commitments. *cf. habitus (Bourdieu); MacIntyre on tradition; existentialist commitment; individuation (Jung).*	**RECONSTRUCTED + ALT**
10	**CIG**	Capital investment generation	Rate at which new habits, routines and mental models are established. *cf. habit-formation timescales (Lally 2010); skill acquisition phases (Fitts & Posner).*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
11	**CID**	Capital investment discard	Rate at which established habits and mental models lose utility and are abandoned. *cf. extinction (operant); cognitive flexibility; belief revision under disconfirmation.*	**TIGHTENED**
12	**CIDN**	Capital investment discard normal (40-yr life)	Baseline turnover rate of established habits and mental models — how long a committed pattern typically persists before requiring replacement, in absence of unusual disruption. World3 assumes a 40-year asset life; the psychological analogue varies sharply by domain (technical skills shorter, character patterns longer). *cf. half-life of professional knowledge; cognitive script revision in life-course studies.* > *Alternative reading.* Character patterns, unlike technical habits, may have no normal lifetime — they belong to a person through their life, and their replacement is less *turnover* than *conversion* or *transformation*, which has different dynamics altogether. *cf. moral conversion (William James); transformative experience (L.A. Paul).*	**RECONSTRUCTED + ALT**
13	**CIM**	Capital investment multiplier	Modulation of the habit/structure formation rate by the available level of stimulation. Rich environments accelerate new pattern formation; impoverished ones suppress it. *cf. environmental enrichment (Rosenzweig); novelty-seeking and learning rate; predictive processing.*	**TIGHTENED**
14	**CIR**	Capital investment ratio (per person)	Density of established habits and mental models per unit of mental content — how heavily the active contents are structured by existing frameworks. *cf. schema density; expertise as compiled structure.*	**TIGHTENED**
15	**ECIR**	Effective capital investment ratio	Functional commitment per person — the fraction of accumulated habit and model that directly increases access to stimulation. *cf. transfer of training; functional fixedness as inverse case.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
16	**CIQR**	Capital investment from quality ratio	Allocation correction: when stimulus-derived quality outpaces recovery-derived quality, investment shifts toward recovery and development to rebalance. *cf. scarcity and attentional allocation (Mullainathan & Shafir 2013); allostatic balance.*	**TIGHTENED**
17	**CIAF**	Capital investment in agriculture fraction *Sustainable-agriculture and food-systems literature has substantially revised the agricultural sector's framing since 1972.*	Fraction of total psychic energy directed toward the joint domain of *recovery* (restoration of capacity, rest, disengagement) and *development* (learning, skill-building, practice). World3 treats these as a single sector; a more refined mapping would separate them, since recovery restores existing capacity while development builds new. *cf. recovery experiences (Sonnentag); deliberate practice (Ericsson); ego-depletion and restoration cycles.* > *Alternative reading.* The recovery/development pair, separated, are both still *productivist* — the mind as something to be restored to function and trained to perform. A constitutive register might treat both as participation in meaning rather than maintenance of capacity: rest as Sabbath, study as formation, neither as means to an output. *cf. Sabbath traditions; liberal-education ideals; Pieper on leisure as basis of culture.*	**RECONSTRUCTED + ALT**
18	**CIAFT**	CI in agriculture fraction adjustment time (15-yr)	Time required for the allocation between recovery-and-development and other commitments to shift in response to changing needs. Slow in adults — established life-pattern is sticky. *cf. life-stage transitions; identity reconstruction (McAdams).*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
19	**CFIFR**	Capital fraction indicated by food ratio	Indicated fraction of psychic energy that should be redirected to recovery-and-development given current availability. When recovery opportunities are scarce, more energy should be allocated to creating them. *cf. compensatory allocation; recovery debt (Geurts & Sonnentag).*	**TIGHTENED**
20	**CIRA**	CI ratio in agriculture	Recovery-and-development investment per person — committed structure in service of restoration and growth.	**TIGHTENED**
21	**FR**	Food ratio	Available recovery-and-development opportunities per person, relative to a baseline level.	**TIGHTENED**
22	**FCM**	Food from crowding multiplier	Modulation of recovery availability by mental crowding — when overloaded contents occupy the spaces that would otherwise host recovery activity. Work-life-boundary erosion is the obvious case. *cf. work-recovery interference; technology-mediated work spillover.*	**TIGHTENED**
23	**FPM**	Food from pollution multiplier	Modulation of recovery availability by tensions and unresolved complexes — even when recovery time is available, tension makes it inaccessible (the holiday spent ruminating). *cf. recovery quality versus recovery quantity; ruminative interference.*	**TIGHTENED**
24	**FPCI**	Food potential from capital investment	Potential of committed habits and models to produce recovery-and-development opportunities. Well-formed recovery practices generate restoration efficiently; poorly-formed ones consume time without restoring. *cf. recovery skill differences (Sonnentag); leisure competence.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
25	**NR**	Natural resources *Renewable/non-renewable distinction (not formal in World3) developed substantially in the 30-Year Update and subsequent literature.*	Stock of psychological reserves — cognitive flexibility, emotional resilience, capacity for sustained attention, resistance to depletion — built up across the lifespan through development and use. World3 treats these as non-renewable; the 2026 reading is more nuanced: neuroplasticity permits partial renewal, but the timescales for adult capacity-building differ qualitatively from early-life development. *cf. cognitive reserve (Stern 2002); ego strength (Block); psychological resilience; lifespan neuroplasticity.* > *Alternative reading.* The reserve-stock framing is itself a resource-management import. A constitutive register reads what is acquired through development not as a *pool* to be drawn down but as a *capacity to receive and respond* — what one has become. Depletion-and-restoration may be the wrong dynamics altogether; formation-and-deformation may be closer. *cf. virtue ethics on character; Bildung; Ricoeur on the capable human.*	**RECONSTRUCTED + ALT**
26	**NRUR**	Natural resource usage rate	Rate at which psychological reserves are drawn down by sustained effort and exposure to demand. *cf. allostatic load (McEwen); ego depletion and its refinements; chronic-demand resource consumption.*	**RECONSTRUCTED**
27	**NRUN**	Natural resource usage normal	Baseline consumption rate of reserves under typical demands — the cost of ordinary functioning, distinct from the additional cost imposed by unusual challenge. *cf. resting cognitive metabolic load; baseline allostatic cost.*	**RECONSTRUCTED**
28	**NREM**	Natural resource extraction multiplier	Reduction in habit/structure effectiveness as reserves decline. Skilled execution requires reserve; depleted reserve degrades the quality of even well-established patterns. *cf. cognitive effort and skill performance; fatigue-induced regression.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
29	**NRMM**	Natural resource from material multiplier	Rate of change in reserve consumption with change in stimulus level — high stimulation consumes reserves faster, low stimulation may consume them too (through under-use atrophy). *cf. arousal-cost relationship; Yerkes-Dodson at the resource level.*	**TIGHTENED**
30	**MSL**	Material standard of living	Available level of cognitive and affective stimulation — novelty, challenge, variety of engagement, density of meaningful events — relative to the baseline state. The brain treats stimulus shortage as a kind of deprivation. *cf. novelty processing (Berlyne, Bunzeck); environmental enrichment; predictive processing — surprise as currency.* > *Alternative reading.* Equating stimulus level with quality of life is itself a contested move — the question is what *kind* of stimulation. Meaningful encounter, beauty, depth of relation — these are different from informational novelty, though all are stimulation in some sense. The cognitive-science framing flattens that distinction. *cf. depth versus distraction in attention; aesthetic experience; meaning-in-life literature.*	**RECONSTRUCTED + ALT**
31	**BRMM**	Birthrate from material multiplier	Modulation of new-content generation by stimulus level. Rich stimulation feeds new conceptual combinations; impoverished environments suppress them. *cf. environmental enrichment and creativity; need for cognition (Cacioppo & Petty).*	**TIGHTENED**
32	**DRMM**	Death rate from material multiplier	Modulation of content decay by stimulus level — the use-it-or-lose-it dynamic. Disuse and understimulation both accelerate decay. *cf. cognitive disuse and decline; environmental enrichment and synaptic preservation.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
33	**POL**	Pollution *Later treatments distinguish persistent from non-persistent pollution; climate-specific work separates GHG dynamics.*	Active unresolved complexes and tensions — emotional residue, unprocessed cognitive load, unfinished psychological business — in the interval between generation and dissipation. *cf. allostatic load (McEwen); rumination; cognitive load remnants; emotional residue (clinical psychology).* > *Alternative reading.* The complex-and-tension language is already phenomenological and largely resists cognitive-science reduction. A depth-psychological reading treats unabsorbed material not as load to be cleared but as content addressing the conscious self from below — what is held off is also what is meaningful. *cf. the shadow (Jung); the return of the repressed (Freud); symptoms as messengers.*	**TIGHTENED + ALT**
34	**POLG**	Pollution generation	Rate at which new tensions and unresolved complexes accumulate. Generated by demand exceeding processing capacity, by frustrated effort, by stimulus that cannot be assimilated. *cf. stress generation; emotional carry-over.*	**TIGHTENED**
35	**POLA**	Pollution absorption	Rate at which complexes and tensions are processed and discharged — through reflection, sleep, emotional working-through, explicit cognitive reappraisal. Absorption rate is itself dependent on the accumulated level. *cf. emotion regulation (Gross); sleep-based emotional consolidation; reappraisal capacity.* > *Alternative reading.* Absorption is not always discharge — some material is metabolised rather than cleared, becoming part of the person rather than leaving. What is taken in is changed and changes the one who takes it in. *cf. mourning as integration (Freud); transformative practices; hermeneutic uptake.*	**TIGHTENED + ALT**

#	Code	World3	Psychodynamics (2026)	Edit
36	**POLAT**	Pollution absorption time (63%)	Characteristic half-life of complexes and tensions — time for the majority to dissipate. *cf. emotional habituation timescales; stress recovery curves.*	**TIGHTENED**
37	**POLCM**	Pollution from capital multiplier	Rate at which committed structure itself generates new tensions — overcommitment, routinisation that no longer serves, habits whose costs now exceed benefits. *cf. burnout from overcommitment; iatrogenic effects of routinisation.*	**TIGHTENED**
38	**BRPM**	Birthrate from pollution multiplier	Suppression of new-content generation by accumulated tension. High tension narrows the cognitive bandwidth available for novel combination. *cf. stress and divergent thinking; broaden-and-build (Fredrickson) as inverse case.*	**TIGHTENED**
39	**DRPM**	Death rate from pollution multiplier	Acceleration of content decay by accumulated tension — items that would otherwise be retained are crowded out by rumination on unresolved business. *cf. cognitive load effects on memory; intrusive thought displacement.*	**TIGHTENED**
40	**QLP**	Quality of life from pollution	Modulation of self-contentment by the level of unresolved tensions — the felt cost of carrying unfinished psychological business. *cf. ruminative subjective well-being penalty.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
41	**QL**	Quality of life *Later treatments increasingly read QL as HDI-adjacent; satisfaction-units framing is a simplification.*	Felt quality of personal life — self-contentment, sense of flourishing, perceived adequacy of one's psychological state. *cf. subjective well-being (Diener); eudaimonic well-being (Ryff); life satisfaction.* > *Alternative reading.* Quality of a life may not be a felt state at all but a feature of the life-as-lived, assessable in retrospect, in relation to commitments and contributions, and not always available to the person living it. Subjective well-being measures what the person feels; eudaimonic measures what kind of life it is; these can come apart. *cf. objective list theories of well-being; narrative ethics; MacIntyre on virtues and the unity of a life.*	**TIGHTENED + ALT**
42	**QLC**	Quality of life from crowding	Modulation of felt quality of life by pressure on the mind's organisational capacity — overload, competing demands, loss of mental privacy. *cf. cognitive load and well-being; attention as scarce resource.*	**TIGHTENED**
43	**QLF**	Quality of life from food	Modulation of felt quality by access to recovery and development — restorative leisure, opportunity for growth and practice. *cf. recovery and well-being; eudaimonic engagement.*	**TIGHTENED**
44	**QLM**	Quality of life from material	Modulation of felt quality by available stimulation — novelty, challenge, meaningful variation. *cf. hedonic-eudaimonic distinction; flow as stimulus-quality marker.*	**TIGHTENED**
45	**BRCM**	Birthrate from crowding multiplier	Modulation of new-content generation by mental pressure. Moderate pressure can sharpen; excess pressure suppresses. *cf. Yerkes-Dodson inverted U; stress-creativity curve.*	**TIGHTENED**

#	Code	World3	Psychodynamics (2026)	Edit
46	**BRFM**	Birthrate from food multiplier	Modulation of new-content generation by recovery-and-development availability. Mind-wandering during rest, incubation during sleep, and deliberate practice all feed new ideas. *cf. incubation (Wallas); mind-wandering and creativity (Schooler); sleep and insight (Wagner).*	**TIGHTENED**
47	**DRCM**	Death rate from crowding multiplier	Modulation of content decay by mental pressure — under load, items lose access without revision. *cf. cognitive load and memory degradation; attention failure under stress.*	**TIGHTENED**
48	**DRFM**	Death rate from food multiplier	Modulation of content decay by recovery-and-development. Rest consolidates; sleep stabilises; practice protects. *cf. sleep and memory consolidation (Walker); rehearsal and retention.*	**TIGHTENED**