

On Cognitive Art & Science: Toward Wholeness From Both Sides

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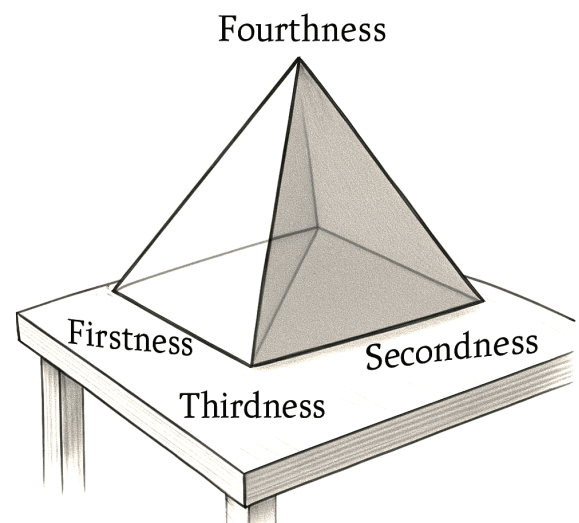
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Positioning cognitive science as the systematic study of intra-action and cognitive art as its reflexive twin, this paper traces a bidirectional trajectory toward systemic wholeness. Procedural craft (firstness) and conceptual articulation (secondness) co-evolve into adaptive intelligence (thirdness), as continuously audited by the observing niche that embeds, measures, and reinterprets those intelligences (fourthness). This four-fold schema maps onto concrete information architectures: from insect bodies, to cryptographically verifiable plain texts, on through variational Bayesian simulations approached from the Low Road of Active Inference. Alternating 2→3 analytical moves which compress past data into predictive structure, with 4→3 generative moves which open space for unknown futures – these systems are capable of balancing exploitation with exploration, measurement with meaning, and optimization with open-ended creativity. True cognitive wholeness emerges when explanation and anticipation co-operate in sustained dialogue across scales.

.0 – On Art as Fourthness

A piece of art does not need to be seen – seen as good, popular, representative, or anything at all.

The persistence of an art piece – the sustained associated memory, discourse, and sensemaking environments around the piece – itself holds open and points towards a broader "what is art?" frame in which that piece is a spectator, passenger, or driver. An art piece points towards a world in which that piece is art (or at least exists). That's all to say, art becomes culture(d).



The semantics of art must have a procedural and/or conceptual relationship with the underlying cognitive substrate (as in [mortal computing](#)).

- Procedural, meaning that the art is produced through "know-how" (**firstness**: habit-in-habitat without need of awareness).
- Conceptual, meaning the art is produced through "know that" (**secondness**: semiotic symbolic propositional linguistic).

Systems which in effect modulate order and disorder (mean and variance, energy and entropy, [pragmatic value and epistemic value](#), exploit and explore) display a **thirdness** in that interaction: intelligence.

Fourthness – the 4th node in the [particular partition](#), the 4th vertex which makes shape space-filling – is the observer of intelligence (represented as a single node for the model scale in which the firstness and secondness interact for the organism). This observer or measurement node is amenable to continued recursive analysis (e.g. from the ethology of birds, to the psychology of ornithologists, to the metascience of psychology).

To give an example, thirdness is the intra- and inter-generational adaptive wisdom of the monarch butterfly which facilitates its navigation through [space](#) and [time](#). Fourthness is the entomologist's capacity to model, understand, and predict this butterfly's thirdness: why does or might it do better/worse/different in terms of what, as measured how, in what situations?

Art in its thirdness asserts a proof by identity (e.g. "*what was meant by this drawing?*" [the piece has to exist for this question's validity]) via a conjoint fourthness ("*... and how we're talking about it today!*" [we have to exist for this exclamation's validity]).

In this way, art really is in the mind's eye of the beholder, no matter though also art describes structures in the niche.

.1 – Cognitive Science and Cognitive Art

Cognitive science is the realization (in theory and practice) of [intra-activity](#), and what comes after that.

Unpacked just a bit, intra-activity is essentially the idea that the rate and type of [interactions](#) matter (what matters for things is their rate and type of interactions). Stated within a [scale-free quantum polycompute](#) ontology: different Alice's respond differently to different Bob's, as viewed by different Carla's.

Moving through that realization threshold, is the beginning of the Cognitive journey of capacities, alignment, composability, identity as dissemination, and more.

Self-awareness of that threshold-crossing, is the moment Cognitive Science becomes Cognitive Art.

On the Partition's De- and Re-Composition

Why do I want to make systems that partition the roles of the viewer, the actor, and the acted upon?

The partition is not (just only) to explain harder, better, faster, or stronger, some type of dataset looking back (this is the move of 2→3). To partition is also to open up to the 4→3 of wisdom grounded in living forward. In other words, to understand what is and will be wise in the present and future (4→3), springing from the platform of what was smart in the past (2→3).

[Newton's Single Vision](#) is exemplified exoterically in terms of Goodhart's Law ("when a measure becomes a target, it ceases to be a good measure"). Today the Single Vision is seen in machine learning benchmark maximization (the "unspoken secret of machine learning research", [GuestStream #115.1](#)).

After all, isn't the goal of 2→3 training to explain, predict, and control better on the dataset as it already happened?

And the goal of 4→3 is to produce, generate, transform, and be ready to be better at what hasn't happened yet?

2→3 is a next-move perspective which is based upon "figuring out" the past (William Blake: "*Man by his reasoning power can only compare & judge of what he has already perciev'd*"). The next-move of 2→3 is quantitatively defined by the decision rules, state, or free energies of the system as monitored (variability-described or -corralled).

The firstness of the 2→3 is akin to Maximum likelihood, Laplace approximation, or the central tendency over a region of support. How much weight that bridge can hold? How much liquidity is in that market and where? How much attention is on that syntax or semantics and when? The figure's firstness takes place within the ground's secondness.

While 4→3 is the gripper-and-gripped, the ground around the figure, the outing of the figure, unity as plural: the marriage of heaven and hell, the interface of the agent and

niche, the open endedness of open endedness (William Blake: “Reason, or the ratio of all we have already known, is not the same that it shall be when we know more”).

Active Inference, approached from the Low Road, provides [tools](#) for variational approximation which apply to various scenarios, including possible arbitrary structural differences between the agents and niche (what a flexible and useful road!). Lifted from empirical specifics though able to apply to them, mathematical generalizations for systems modeling can be designed, developed, and operated. The next move can be figured out from all moves.

Now consider systems whose information architecture aims to enable artful Wisdom-craft alongside smart Intelligence-science — think LISP 4 meets [Walden 4](#). These information systems benefit from modern computer science and cryptography, though in principle they can be implemented across formats/media (e.g. verbally, on index cards, vinyl, digital, neuromorphic, symbolic, and hybrid systems). Some past instantiations and aspects of these systems are known by e.g. BOLTS, ATLAS, ONFT, P3IF, OAKS, NIM, VIE, CATSKILLS, POSE, GNN, CEREBRUM.

With such systems, we might approach thirdness (intelligent wholeness) from a fourthness as well as a secondness (approaching “on” from both “in” and “out”). In this dual approach there can be instrumented realism across different formats, all [well-tempered](#) and partitionable in terms of their syntax and semantics.

Politics of the Cognitive

[We](#) the people, are the ones with our priors on the table and posteriors on the line; the ones whose [difference makes a difference](#). We whose recognition of (ourselves and each other as) systems as cognitive, is firstly implicit (Act: primary embodiment), secondarily explicit (Infer: symbolic updating), and thirdly (in Service) interfaced with the fourthness of the niche (the Unknown which we are ever coming from and returning to). Each deserves to be treated, that they may (be) respect(ed by) the all.

Hence my “alignment” paradigm: To make accessible, rigorous, and applicable, the healthy, tasty, and generous. This, I wish for each, including that they would wish the same to me. Consider it an extension of the Golden Rule into a [Cognitive Bimetalism](#): that any one would not have an increased share of a dying whole, but rather that each one would increasingly share a living all.

.2 – A Closing Reflection

Putting that 2→3 lens back on: every muscle cell in principle could be treated with a Game Theoretic descriptive analysis, in which muscular contraction comes with some threat or risk of diminishment or death, perhaps especially in times of organismal vulnerability and change (and it does!). That is the Prisoner's Dilemma, that each cell would be short-term smarter in defecting, though long-term wiser is cooperating informationally or genetically, on that next canal jump or swing of the bat. Now imagine the 2→3 work is done: we have an atom-scale "digital twin" for the muscle's "how". Wouldn't the sunset on that long scientific day, the table being fully set, just be the dawn of the artistic night to come?

The 2→3 moonshot question for Cognitive Science is: Can we land on Marr's levels?
The 4→3 moonshot question is: Can we land on Maslow's?

The [2→3 and 4→3 = "two eyes open" = "a bicycle is not two unicycles"] moonshot is: Can we land on Marr's and Maslow's? Can we hold whatever measurements we want to do better upon ([faster fastballs](#) and longer canal jumps) as our Known Unknowns, within a context of 4→3 and all the Unknown Unknowns entailed? Can we have less-filling and greater taste? Can we dare to be naive and do more with less? So that no matter how close to 3 it seems like we're getting from 2, we understand that "going out" to the limit from the left side is qualitatively different than "coming back" from the right?

The Low and High roads meet at completion and wholeness via complementary paths, negatively-opposed non-negations totally married to one another (William Blake: "*Negations are not Contraries: Contraries mutually Exist: But Negations Exist Not*").

As Dean might say, there is "quite literally" a coming back to go out for a Wayfinder, the Eternal Return of always already skiing downhill on the [dark](#) 4→3 slopes, meeting that bright 2→3 intern as they head up and out.

And approaching wholeness from both sides in this way, is a wholeness of its own.