

RESEARCH SHORT

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September 19, 2024

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New Cognitive Rules for a Complex World

Josh Kerbel

In 1990, the world was on the cusp of a major transformation. The bifurcated, static, high-control, and hierarchical Cold War era was giving way to the entangled, dynamic, low-control, and networked world of today. The cognitive challenges posed by such a complex environment were highlighted that year in Michael Crichton's novel *Jurassic Park*, in which the chaotician Ian Malcolm referred disparagingly to the scientists who had too assuredly cloned the dinosaurs: "They don't have intelligence. They have what I call 'thintelligence.'... They think narrowly and they call it 'being focused.'... They don't see the consequences." Crichton's words warn us that applying excessively *analytic* rules to highly complex challenges often mislead us. This Catalyst explores complementary "rules of synthetic thought" for the IC to employ—heeding Crichton's warning.

“Thinking Narrowly”: Biases Inherent in Analysis

As a long-time intelligence analyst who spends much time thinking and writing about the craft, Crichton’s passage on “thintelligence” still resonates with me. The way it characterizes the scientists’ thinking sounds alarmingly similar to how the IC tends to think. What Crichton called “thinking narrowly” and “being focused,” we in the IC call “analysis”—an apt term for characterizing the IC’s default cognitive mode. We call our “thinkers” analysts, a term derived from the Greek verb *analyein*, meaning to loosen, undo, dissolve, or resolve into constituent elements. “Analysis” perfectly embodies the highly reductive way in which the IC tends to think about the world.

This analytic bias is instilled in us long before we ever become intelligence analysts. From a young age, we’re taught to look at the world through tidy taxonomies of distinct disciplines, subjects, categories, accounts, and bins. We learn to value deep expertise and to correspondingly disparage generalists as “Jacks and Jills-of-all-trades and masters-of-none.” We’re guided in how to use prose to make linear arguments, and the more contextual visual/graphic arts are often reserved for the identified artists among us. So much of the (mostly Western) art we’re exposed to emphasizes subject over context. Most of the metaphors we see and hear used to describe systems—terms such as inertia, momentum, tension, leverage, trajectory, and so forth—are drawn from the realm of linear mechanics. And we’re academically judged mainly on our ability to arrive at singular and correct answers, not to ask more open-ended questions and accommodate uncertainty.

These rules of analytic thought work very well when applied to linear, *complicated* systems that are effectively discrete (bounded) and hierarchical (top-down and bottom-up). Consequently, they

The Western tendency to view the world as a complicated machine rather than a complex, organic system is deeply rooted in Newtonian mechanics. This tendency is reinforced by both linear bias—one of the universally human cognitive biases of the sort explored by Kahneman and Tversky—and analytic bias—a more cultural bias explored by Richard Nisbett in his work on the geography of thought.

RULES OF ANALYTIC THOUGHT

Four fundamental analytic heuristics—or rules of thumb—take root in our minds via the merging of a universally human (linear) bias with a more uniquely Western or US (analytic) bias that tends to be implicitly but repeatedly reinforced as we grow up and learn:

- 1. The Rule of Additivity.** The whole is equal to the sum of its parts. We can understand a system of interacting parts by looking at the parts separately—by analyzing them—and then just adding them together. This rule of additivity underpins the analytical reductive approach.
- 2. The Rule of Identifiable Cause and Effect.** If we look for clear cause-and-effect chains (X led to Y

and Y led to Z), we should be able to see them—at least in retrospect.

- 3. The Rule of Repeatability.** The way the system has been behaving is likely to be the way it will behave into the future and, if it deviates, it probably will do so incrementally. This rule encourages us to extrapolate existing trends indefinitely into the future, setting us up for a nasty surprise when those trends inevitably meet a discontinuous inflection point that disrupts them.
- 4. The Rule of Proportionality.** A small input will result in a small output, and a large input will result in a large output.

worked sufficiently well for understanding challenges, such as the former Soviet Union or even the larger Cold War, which constituted the modern IC's formative experience. More precisely, it's fair to say that these rules played a significant role in helping the IC provide US policymakers with enough of an understanding of the Soviet Union and Cold War to enable appropriately modulated behavior. Some might argue that's a pretty low bar, but that doesn't negate the fact that the IC can fairly claim to have helped usher the Soviet Union and the Cold War into a relatively peaceful (in the most important sense) grave.

Prompting Cognitive Failures

But here's the rub: as much as these cognitive rules helped us think effectively about the Soviet Union and Cold War, they are not helping us think effectively about today's messier global security environment. Today's more nonlinear, *complex* environment is neither discrete nor hierarchical. It's unbounded and networked—so it confounds those analytical rules. If we rely on them to think about today's global system, it's almost guaranteed that we, and the policymakers we're trying to support, will misunderstand and, thus, be frequently and unpleasantly surprised by the broader system's behavior.

Unfortunately, the IC's track record over the past 30 years only reinforces this conclusion. Since the end of the Cold War and during the profound global transformation that has followed, at least four major cognitive failures stand out. These failures reflect all four rules, with one or two of the rules particularly conspicuous in each failure.

Terrorism. We simplistically reduced *terrorism* (a systemic phenomenon), via Rule 1, to *terrorists* (actors) and the *Global War on Terrorism* (a unidimensional military response). And while we became very good at finding and eliminating many of those individual terrorist elements, we largely failed to understand terrorism as a broader systemic phenomenon—as Hamas's surprise attack on Israel in October 2023 reminded us.

2008 Financial Crisis. All four rules came into play during the 2008 financial crisis. Rule 1 encouraged us not to see the system as a whole and consequently we missed—or at least underestimated—how one sector (for example, US home mortgages) could render the entire global financial system vulnerable. Rule 2 promoted our failure to anticipate the nonlinear dynamics that would ripple across the entire system in an unconstrained and unpredictable manner. Rule 3 boosted our pre-existing belief that the system would just continue to hum along indefinitely—until, to our surprise, it didn't. And finally, Rule 4 promoted a false sense that the collapse of one financial institution couldn't trigger a disproportionate wave of disruptive impacts that would put the entire system in peril.

The point is often made in response that a huge number of financial organizations, given their economic orientation and resident expertise, bear more responsibility than the IC for misunderstanding the conditions that led to and fed the 2008 crisis. While that may be true, it also doesn't absolve the IC. Moreover, it shouldn't surprise us. After all, those financial organizations hire candidates educated in the same analytically oriented educational institutions from which the IC also hires.

Arab Spring. A mere two years after the financial crisis, the blunders associated with the Arab Spring are most obviously rooted in Rule 1, whereby we failed to appreciate and effectively communicate

how the region was *conditionally ripe* for a political firestorm. This misunderstanding was reinforced by Rule 4, which made it hard to conceive how a unique event, such as a single fruit-seller lighting himself on fire in Tunisia, could rapidly spiral into regionwide upheaval. It's worth noting that the cognitive failures associated with the Arab Spring are especially troubling considering the IC had spent the previous eight years pouring immense amounts of time, money, and resources into understanding that region of the world.

COVID-19 Pandemic. The fourth cognitive failure is the COVID-19 pandemic, including the associated massive *supply chain disruptions*, which might well be seen as a fifth failure. Like the financial crisis, the COVID-19 failure was rooted in all four rules. Some intelligence analysts may respond that, for many years prior to COVID-19's emergence, the IC had predicted the likelihood of a pandemic—most notably in the National Intelligence Council's periodic *Global Trends* reports. Although true, it's an unpersuasive defense. First, predicting a general recurrence of a phenomenon that has been with us through history is not particularly forward-leaning. More damning, however, is that the four rules impeded us from thinking imaginatively—beforehand—about what a pandemic might look like in a hyperconnected world and what we might do to prepare and possibly mitigate its impacts. Consequently, we in the IC found ourselves—admittedly, like just about everyone else—in a highly reactive position at a time when that is exactly where you don't want to be.

Fundamentally, all these failures to understand and anticipate the emergence and courses of each of the above issues, were largely functions of thinking in excessively analytical terms—of focusing on the component pieces of the system versus thinking in terms of a systemic whole. But before we discuss how to remediate this type of thinking, it's important to understand what we're talking about when we refer to emergent phenomena.

Thinking Synthetically: Addressing Emergent Phenomena

At their essence, emergent phenomena are systemic macro-behaviors that grow organically out of complex (highly interconnected and interdependent) systems; they “emerge” without top-down direction. All of the phenomena described in the above failures—terrorism, financial crises, political instability, and pandemics and supply chain disruptions—are emergent. I use the present tense because it's important to recognize that none of them are, despite what we might wish to believe, consigned to the past; emergent phenomena are never really “solved” or “over.” Rather, they evolve, morph, change, adapt, settle down, and flare again in new ways, shapes, or forms.

Not only are the above issues not gone, but a scan of the national security horizon tells us many more are in play: climate change, infosphere contamination, urbanization, mass migration, inequality, extremism, and so forth. All told, the future of national security is littered with such phenomena. We need to get attuned to them.

This *Research Short* uses the term “synthetic” in a philosophical sense and not in a material (e.g., artificial) sense. The term refers to thinking holistically—and nonreductively—about complex issues. Within the rich literature on Complexity Theory, M. Mitchell Waldrop's *Complexity* and Tom Czerwinski's *Coping with the Bounds* are good places to begin one's exploration.

Unfortunately, the IC struggles mightily with this prospect. For one thing, the IC was not designed with phenomena-based challenges in mind—it was created to deal with discrete actor-based challenges. (Remember how we dealt with the terrorism challenge—by turning it into terrorists.) Actors, of course, have plans, intentions, and motives that can—at least theoretically—be collected and discerned. Consequently, almost all the IC’s prevailing processes, mindsets, models, and habits work well when applied to such traditional challenges.

We see this powerful disposition most prominently in the growing chorus about the absolute need to “win and not manage” the China challenge,^{*} which is largely emergent. Sure, China is an actor and, as such, seems at first glance to be a good candidate for our traditional approaches: classified collection and analytic thought. Although those approaches are certainly applicable to certain parts of the challenge, they will almost certainly fail to address what may well be the most important aspect: China is fully enmeshed in today’s hyper-complex global system (unlike the Soviet Union) and is a vital aspect of the aforementioned emergent challenges. The United States will not be able to effectively address any of these phenomena—or China itself for that matter—without a good understanding of how China fits into the larger systemic global picture.

Offering a New Set of Rules: The Rules of Synthetic Thought

So, what remedial measures must the IC take if it is to address its cognitive deficiencies? Foremost, the IC needs to admit that it has a problem that requires real change. Unfortunately, the cult of evolutionary improvement (better/stronger/faster/smarter) pervades the IC. Think of the person at the beginning of a 12-step program who has yet to take the first, arguably most crucial, step: acceptance.

Next, I would propose adopting four new rules—let’s call them the rules of *synthetic thought*—keyed off the behavioral characteristics of nonlinear, complex systems. These new rules would be added to the IC’s “cognitive quiver” and used when thinking about truly complex environments and the emergent phenomena they generate.

The first rule I offer for recognition is that, **in complex systems, the whole can be more (or less) than the sum of its parts**. The essence of a complex system cannot be discerned from its distinct or discrete pieces but rather in the relationships—the interconnections and interdependencies—that make it a systemic whole. To more fully understand any complex system, we must see it in a “big picture” way and consequently think about it synthetically or holistically—not analytically.

The second rule acknowledges that, **in complex systems, cause-and-effect dynamics are often not readily identifiable, even in retrospect**. What we often see is correlation, not causation. Moreover, any input in a complex system has more than one output—there are *always* side, second order, or tertiary effects.

^{*} See, for example, Matt Pottinger and Mike Gallagher, “No Substitute for Victory: America’s Competition With China Must Be Won, Not Managed,” *Foreign Affairs*, April 10, 2024, <https://www.foreignaffairs.com/united-states/no-substitute-victory-pottinger-gallagher>; and Matthew Kroenig and Dan Negrea, “Against China, the United States Must Play To Win,” *Foreign Policy*, June 24, 2024, <https://foreignpolicy.com/2024/06/24/usa-china-biden-xi-taiwan-competition-ccp-war/>.

The third rule encompasses the idea that **a complex system is *not* repeatable**. Even though circumstances might resemble what came before, we need to understand they are not the same. Analogical reasoning is a bedrock practice of traditional intelligence analysis, but we need to be very discerning in the analogies we make because despite certain obvious similarities—say between the Soviet Union and today’s China—the differences are greater and more significant. This new rule should compel us to think very carefully about the blanket application of a “new Cold War” moniker to our relationship with China, especially the danger of defaulting to the “old Cold War” understanding and playbook. Bottom line: The circumstances with China are not a repeat of the Cold War.

Lastly, the fourth rule recognizes that **disproportionate input-output dynamics are common in complex systems**. Seemingly large inputs can sometimes be absorbed and dampened by the system or, conversely, relatively small inputs can be amplified quite substantially. In the case of the former, think of a bold policy measure that seemingly ends up having little or no observable effect; in the latter, think again of how the previously mentioned fruit-seller in Tunis sparked a region-wide conflagration or how the collapse of Lehman Brothers investment bank precipitated a global financial meltdown.

These new rules, if used collectively as a prism through which to look at the complex security environment, can help us generate—or rather synthesize—insightful questions about potential systemic behaviors and better anticipate emergent security challenges. Note that I say questions, not answers. Complex environments are inherently unpredictable and uncertain, as Crichton explained in *Jurassic Park*. Thus, the IC’s traditional inclination to seek and provide definitive answers should not be the goal. Rather, forming better questions is the goal, and the ability of the new rules to help us do just that should make their adoption and implementation by the IC a priority.

Associated contextual changes—organizational, informational, methodological, metrical, and so forth—must also be made if the IC is to effectively adopt and reap the benefits the new rules offer:

- Most prominently, the IC’s existing hierarchical structures—with their artificially distinct and excessively narrow accounts or “lanes”—are fundamentally incompatible with looking at the global security environment as a holistic (unbounded) network. This flaw is reinforced by a traditional emphasis on classified information and the accompanying need-to-know compartmentalization requirements that prevent the development of a truly contextual and broad understanding of issues. If the IC is to effectively employ the proposed new rules, it must find a way to foster entities that can accommodate a more open and free-flowing approach to information and perspectives.
- The IC must find a way to balance its traditionally reductive methodological techniques with more synthetic ones. Such synthetic techniques include gaming, modeling, and simulation. They can be high-tech (advanced computer modeling and simulation) and low-tech (face-to-face tabletop wargaming). But such methodologies need to become mainstream rather than be seen as alternative or specialized approaches to understanding the security environment.
- The IC must also reevaluate metrics as incentives. Traditionally, the IC has measured analytic success by counting production—*outputs*. While a valid industrial measure for what was an

industrial era (the Cold War) and problem (the Soviet Union), in today's information age, output-based measures are less useful. Rather, *outcome*-based measures that address insight and impact are necessary.

Let's also be clear: this is not a simple matter of scrapping one set of rules for another. These new rules of thinking and the contextual environments that will promote them are not outright replacements for the traditional analytic rules and contexts—they are “and, not or” complements.

Analytic thinking still has a place, especially when applied to appropriately complicated issues, which are more discrete and structured, such as tactical intelligence support. Analysis can also—if used cautiously—enhance understanding and manageability of some complex challenges by bringing a degree of useful simplification. As long as the unavoidable artificiality of that simplification is acknowledged and accounted for via the complementary use of synthetic approaches, analysis is not worthless—even with regard to complex issues.

A Way Forward for the IC

The future of the IC then—if it is to have one—is *both* analytic and synthetic. Better analysis alone—no matter how profound—will not markedly improve the IC's ability to understand and anticipate the unpredictable dynamics of the emerging strategic security environment. Only intelligence synthesis can provide that ability, which is where the new cognitive rules come into play.

By adopting and using the new rules to inform our thinking about the complex security environment, the IC should be better able to open its aperture and see the “big picture”; recognize correlation; envision multiple possible outcomes; and foresee, imagine, and anticipate the generation and progression of emergent phenomena. Fundamentally, the new rules may be some of the best tools we have for appreciating and coping with the unavoidable uncertainty that our ever more entangled world presents.

Ultimately, the IC does not really have a choice regarding adoption and use of the new rules. To go all in on the better/stronger/faster model of improved analysis, rather than to layer on synthetic thinking about today's and tomorrow's complex issues, is to effectively opt for extinction's bureaucratic equivalent—irrelevance. Even vastly improved intelligence analysis—without a robust synthetic complement—will not spare the IC a Jurassic fate.

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