
THE PARADOX OF INTENTIONAL EMERGENT COHERENCE: ORGANIZATION AND DECISION IN A COMPLEX WORLD

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The work presented here draws upon previous empirical research into the birth and development of a particular type of international organization, the international parliamentary institution (IPI), of which the European Parliament is the best known.² It generalizes the concepts framing that research to organizations at large, including political nation-states, by grounding it explicitly in the theory of complex systems as well as in the classics of the political science literature, especially works strongly associated with questions of international relations and change in the foreign policy behavior of states. By extending the original framework so that it is applicable to social systems in general, the present article includes nation-states in general and their foreign policy behavior in particular within the scope of study. Its fundamental grounding in the theory of complex systems is what allows this extension.

Political scientists concerned with foreign policy analysis have spent a great deal of effort trying to define learning within their domain of expertise and also distinguishing this from types of change that may not be qualified as “learning.” For example, the categories of “change” and especially “adaptation” have received a great deal of attention in this context.³ State foreign policy decision-making follows very much the same organizational and informational patterns that the epigenesis of international parliamentary institutions does also.⁴ In cybernetic terms, the tasks facing IPIs seeking to survive and grow on the one hand, and, on the other hand, the tasks facing states in international politics are in fact similar; only the resources available to accomplish them differ. The general framework presented here provides a way to take that difference in resources into account, and so it is applicable to states as well as to IPIs, and by extension any political or social organization or system. This means, of course, that it is also a framework of analysis for the growth, development, and decisions of individual human beings.

“Complexity Science” or “The Complex Sciences”?

Complex-science or “complex-scientific” studies, like structuralist studies, are an approach to the creation of knowledge. Consequently, it is more appropriate to speak of “the complex sciences” than of “complexity science.” The former locution makes it clear that the complex sciences are not a delimited set of fields of knowledge to be explored from either a complexity standpoint or a non-complexity standpoint, but rather the manifestation of one perspective on the world and knowledge-creation about the world. In order to underline this distinction, for the purpose of the present article the compound attributive adjective “complexity-science” (as in “complexity-science approaches”) is replaced by “complex-scientific” (thus “complex-scientific approaches”).

It is necessary to explicate the distinctive characteristics of the complex sciences in order to ascertain what the limits to knowledge about them are. The best vehicle for that explication is by analogy to the exegesis of Lévi-Strauss’s structuralism by Piaget, who shows how different applied structuralisms within various fields of knowledge are conditioned by the sociologies of knowledge constructing these disciplinary fields of study, which in turn vary across time and space, even within the same field of knowledge. The three central notions of Piaget’s exegesis of Lévi-Strauss are *totality*, *self-regulation*, and *transformation*. Defining these three categories as the components of a structure, Piaget distinguishes how they manifest and differentiate comparative structuralisms across fields of knowledge from mathematics to anthropology, passing through the natural sciences, life sciences, and social sciences.⁵

Winch’s application of a Wittgensteinian approach to social science sets Piaget’s notion of structuralism into relation with the epistemology of complex systems. In particular, Winch explains how any social science may construct its epistemology by establishing the categories of structure, norms, and behavior, and using any two of these to study the third.⁶ Inspection of Piaget’s exegesis of Lévi-Strauss reveals “totality” as the principal characteristic of a given *structure*, “self-regulation” as principally characterizing *norms* (since it is according to norms that such self-regulation occurs), and “transformation” as a characterization principally of *behavior* (involving change over time and therefore differential). In other words, structures define what is possible while norms operate within structural constraints so as to generate that

which actually manifests in the world. So it is that norms operate upon structure to produce behavior; or, put another way, structure is mediated through norms into behavior. Stated with a still greater degree of generality: Totality is akin to a domain, self-regulation akin to a function, and transformation akin to a range: the laws of self-regulation act upon the totality and result in transformation.⁷

Complex-scientific approaches to knowledge-creation are the constructive response that goes beyond the critical destructiveness of “post-structuralism.”⁸ Building blocks of the complex sciences include three fundamental categories that are extensions of the three categories forming the basis for the structuralist epistemology that Piaget extracts from Lévi-Strauss. In particular: (1) the complex-scientific extension of the structuralist category of “totality” is *coherence*, (2) the complex-scientific extension of the structuralist category of “self-regulation” is *autopoiesis*,⁹ and (3) the complex-scientific extension of the structuralist category of “transformation” is *emergence*. However, Winch’s epistemology as applied to the structuralist social sciences does not provide the basis for extension to the epistemology of the complex sciences; specifically, in the complex sciences it is not the case that any two fundamental categories (among coherence, autopoiesis, and emergence) can be used to study the third. Rather, autopoiesis mediates coherence and emergence.

There are three interrelated approaches to the modern study of complex systems, each focusing on one of the components of a social science as enumerated above according to Winch: (1) how interactions give rise to patterns of *behavior*, a largely North American approach typified by an emphasis on “complex adaptive systems”; (2) understanding the different ways in which complex systems may be *normatively described*, a mostly European approach characteristic of the natural sciences and typified by Prigogine and the approach to thermodynamics; and (3) the process of *structural* formation of complex systems through pattern formation and evolution, a cybernetics-based and system-theory-oriented approach adopted in both Europe and North America.¹⁰ The present article is situated in the tradition of the third of these approaches, which, in Winch’s terms, combines the study of behavior and of norms in order to explain structure.

Functionalism and Organizational Development

Within this general approach, the present article establishes a framework for evaluating the growth and decline of organizations and other social systems, determining what leads some of them to respond adequately to demands imposed upon them by their environment, and others not. The framework synthesizes two apparently mutually exclusive taxonomies: one concerning how organizations maintain homeostasis in order to survive, the other about how organizations develop and adapt in order to grow.¹¹ Table 1 summarizes the first taxonomy, which concerns how organizations survive; it emphasizes the creation of organizational structures so as to accomplish functional tasks; it comprises the two principal categories, internal functions and external functions. The order in which any organization accomplishes the internal functions in fact defines an evolutionary sequence: (1) informational activities, (2) normative activities, (3) rule-creating activities, (4) rule-supervisory activities, and (5) operational activities. Only organizations that successfully perform lower-numbered internal functions have the opportunity to move on to the higher-numbered. “Operational activities” are activities undertaken with reference to the physical and institutional environment. They represent the spillover from the full development of internal functions to the deployment of external functions.¹²

Internal Functions	External Functions
1) Informational activities 2) Normative activities 3) Rule-creating activities 4) Rule-supervisory activities 5) Operational activities	1) Interactions with other organizations 2) Adaptation 3) Normative integration 4) Cultural issues

Table 1. Internal and External Functions of an Organization.

Table 2 summarizes the second taxonomy, which adopts an “epigenetic” approach, concentrating not on established functions (as does the first taxonomy), but rather on the new functions that must develop for effective growth; it addresses the growth of institutions and communities through an almost biological metaphor. This second taxonomy establishes four categories, each of which identifies each category with an analytical task in the study of organizational survival and development. Setting these two taxonomies in relation to one another problematizes the relevant

theoretical questions, establishes the necessary constraints on the research design, and suggests how to code information concerning the development of these organizations.¹³

ERKLÄRUNG ("Explanation," its "variables," and their categories)				VERSTEHEN ("Understanding")
"Variables" (in "Explanation")	Independent: Evolutionary level	Intervening: Locus of power	Dependent: Performance	[Interpretation:] Sequence of integration
Categories of variables	Stage of: – Initiation – Takeoff – Spillover	Degree of: – Elitism ^a – Internalization ^a – Responsiveness to demands and feedback	Robustness of: ^b – Information and communication – Motivation – Spheres of competence	Nature of: ^c – Merging units – Emerging unit – Functional statements vs. "real sequences"

Table 2. Elements for an Epigenetic Analysis of General Organizational Evolution.

^a The present short article does not address these categories; however, operationalizations may be found in Hayward R. Alker, "On Political Capabilities in a Schedule Sense: Measuring Power, Integration, and Development," pp. 307–73 in *Mathematical Approaches to Politics*, ed. by H.R. Alker, K.W. Deutsch, and A.H. Stoetzel (Amsterdam: Elsevier, 1973).

^b See the reformation of Etzioni's categories as explicated in the text.

^c This column of the Table is more directly pertinent to Etzioni's original concern with international communities, than to state foreign policy making *per se*; therefore, it is included for completeness but not discussed in the present article.

The first taxonomy emphasizes the creation of organizational structures to fulfill and accomplish prescribed "internal" and "external" functions while the second, adopting an epigenetic approach and concentrating on new behaviors called forth by the environment, comprises four principal categories: stages of development, locus of power, performance, and sequences of integration. The innovation and incorporation of procedures for accomplishing "internal functions" represent a response to developmental challenges in the life of the institution. Organizational success in adapting to these tasks therefore represents a passage from one phase to another. Organizations must as a rule first evolve internal functions permitting them to exist stably in relation with their constituent parts. Only then, according to this idealized functional sequence, may they engage pro-actively with the external environment. Therefore the development of internal and external

functions, posited by the functional taxonomy, may be heuristically treated as a teleology of potentials for the evolution of any given organization.

The functional framework is thus first-order cybernetic, pertaining to the cybernetics of observed systems; the epigenetic is second-order cybernetic, pertaining to the cybernetics of observing systems.¹⁴ Their synthesis, denoted the “paradox of intentional emergent coherence,” lays stress on autopoiesis and learning. In this presentation, the two taxonomic frameworks are intermediated by necessary constructs that may properly be called one-and-a-half-order-cybernetic. These constructs are akin to the “middle voice” of verbs in classical Greek, where the subject acts on or for itself, halfway between (passive) first-order-cybernetic and the (active) second-order-cybernetic frameworks. Indeed, insofar as constructivism in the social sciences dissolves the distinction between norms and structures, treating them equally as merely different ways of regarding institutions, it represents a bridge to *autopoiesis as the mediating term between coherence and emergence*. This is the process that fundamentally characterizes the Paradox of Intentional Emergent Coherence.¹⁵

David Easton’s application of systems theory to the study of politics distinguished among the elite, regime, and community sectors of the political system.¹⁶ What the elite is, is self-evident.¹⁷ The “regime sector” comprises those institutions of the political system through which governance is executed. The community sector is basically everything else. David Apter explicitly reintroduced the notion of qualitative communication among these sectors. He drew particular attention to the flow of “information” from the community to the regime and from the regime to the elite, and of “coercion” in the reverse direction. His mature theoretical work is inspired more by Deutsch’s than by Almond’s adaptation of Easton’s systems approach.¹⁸ Karl Deutsch replaced Easton’s “less precise concepts of demands and supports” with “the concept of message units or informative bits.”¹⁹ More important, he introduced the crucial distinction between primary and secondary feedback in the attempt to grasp what “consciousness” and “learning” might mean where political systems were concerned. His overall goal was to explicate such philosophic categories as “choice,” “will,” and “autonomy” in information processing terms. Following Deutsch’s definition of “information” as a “patterned relationship between events,” Apter returned to the emphasis placed by Max Weber’s American student Talcott Parsons on *action*, “a more narrow term that includes choice and will,” as opposed to *behavior*, which “may include the mechanistic response characteristic of lower animals.”²⁰

Work by Karl Deutsch helps to render Etzioni's epigenetic framework operationally second-order cybernetic. According to Deutsch, foreign policy learning may be cognitively manifested either through the transformation of goals held at the outset into goals not previously conceived, or through the choice of pre-existing alternative goals over other goals originally held. His project in his classic *Nerves of Government* was, among other things, to translate the categories of classical European philosophy (before the latter was depsychologized by Bertrand Russell and his continuators) into cybernetic language.²¹ However, the limitations of the conceptual apparatus available to social science at the time he wrote leave him often a prisoner of a functionalist and homeostatic framework. In the later sections of the book where he reintroduces the category of will and other volitional concepts, he points explicitly towards the key second-order cybernetic principle of autopoiesis.

Indeed, Deutsch's translation of "faith" and "grace" into cybernetic language are remarkable attempts to overcome the limitations of first-order cybernetics. Deutsch's cybernetic treatment of categories of classical European philosophy goes some distance, though not all the way, towards infiltrating an autopoietic (second-order cybernetic) aspect into the first-order cybernetic framework that he inherited from the structural-functionalist application of general systems theory within political science. In this way Deutsch partly infiltrated an autopoietic aspect into the first-order cybernetic framework that he inherited from general systems theory.

Epigenesis and Organizational Autopoiesis

Etzioni's epigenetic "performance" categories were (1) communication, (2) information, and (3) control. However, these categories are still somewhat limited by the dynamics of first-order cybernetics. It is therefore necessary somewhat to reconceptualize them. One additional well-known mainstream political-science work, the seminal work on the foreign-policy decision-making approach from the early 1960s, completes the integration of Etzioni and Deutsch into a fully second-order cybernetic outlook.²² It not only helps to correct Etzioni's taxonomic triad of performance variables, but also supplies a framework in which certain categories of Deutsch specify and operationalize that performance triad of Etzioni. That work enumerated three "clusters of variables" (or sets of phenomena), each of which addresses some facet of how people making decisions in organizations operate.

These clusters are (1) communication and information, (2) motivation, and (3) spheres of competence. Together they motivate the re-specifications of Etzioni's performance categories. The relation to Etzioni's triad of performance variables is as follows. The *communication and information* cluster is about communication in organizations, and also about the organization of communications; it subsumes two of Etzioni's original categories. The *motivation* cluster is about goals in organizations and is entirely absent in Etzioni. Deutsch uses it along with other volitional concepts. The cybernetic term for autonomy of motive is *autopoiesis*, and this concept is the lever with which to open the overall problématique to second-order cybernetic considerations. The *spheres of competence* cluster is about authority in organizations; it is a less mechanistic, more second-order cybernetic expression of Etzioni's category of "control."

The three "stages of development" inherent in the epigenetic framework (initiation, takeoff, and spillover) may be considered as not "stages" *per se* fully describing a continuum of development, but rather phases in the transition of an organization from one category to another in this typology. With this expanded theoretical content, it produces a hierarchy for classifying organizational development (see Table 3) that serves also as a template for mapping foreign policy decisions.²³

Still closer inspection of the synthesis of the functional and epigenetic taxonomies discovers the influences upon an organization's achievement or failure to move from one rung of the developmental ladder to another. These influences are expressed in particular by the setting into mutual relation of the "locus of power" and "performance" categories of the epigenetic framework on the one hand with, on the other hand, the organization's "external functions" as specified in the functionalist framework. External functions have two aspects: normative and behavioral. The key to examining performance is an assessment of the "behavioral aspects." The functionalist framework defines this as the organization's adaptation and its interactions with other organizations. ("Organizations" may be construed in the sociological sense to include nonbureaucratic structures as well as structures in the environment.) Adaptation occurs (or fails to occur) with respect to the organization's institutional environment, and in the second instance, with respect to the demands (both internal and external) on the nascent organization.

<i>(Implementation)</i>		Phase 3	
Competence	Operational activities		Spillover
<i>(Preparation for implementation)</i>		Phase 2	
Motivation	Rule-supervisory activities		Takeoff (2 nd moment)
	Rule-creating activities		Takeoff (1 st moment)
<i>(Processing of information)</i>		Phase 1	
Communication and information	Normative activities		Initiation (2 nd moment)
	Informational activities		Initiation (1 st moment)
<i>(Collection of information)</i>		Phase 0	
<i>(Phase of foreign policy decision making)</i>	Functional requisite of organizational development (see Table 1)	Evolutionary phase of organization	Epigenetic moment in organizational development (see Table 2)

Table 3. Concordance between Functional Requisites and Epigenetic Moments in Organizational Development, and also by extension to Phase of State Foreign Policy Decision Making. (Read this Table from bottom to top.)

There is a one-to-one correspondence between the analytical subcategories of these interactions with other organizations, under the functionalist framework, and the criteria of performance under the epigenetic framework. To be exact, there are under the functionalist framework three elements of “interactions with other organizations” (threat systems, hierarchies, and goal definition and realization), and under the epigenetic framework there are likewise three performance criteria. Table 4 sets these into a one-to-one correspondence, establishes the synthesis and, through the Deutsch–Etzioni transformation, it operationalizes the first-order-cybernetic categories necessarily in a second-order-cybernetic manner.

EPIGENETIC “LOCUS OF POWER”			
<i>[Response to demands/feedback = Performance]</i>			
<i>Performance variables operationalized as “capacities”</i>	Hierarchies	Goal definition and realization	Threat systems
Primacy capacity	1) Fundamental restructuring	1) Steering capacity	1) Power
Secondary capacity	2) Inner rearrangement	2) Depth of memory	2) Intake channels
<i>Functional behavior characteristic of the performance variable</i>	Communication and information	Motivation	Spheres of competence
<i>[Interactions with other organizations]</i>			
FUNCTIONAL “EXTERNAL BEHAVIOR”			

Table 4. How Deutschian “Capacities” Operationalize Performance Variables from the Functional and Epigenetic Taxonomies, Transforming the First-Order Cybernetic into the Second-Order-Cybernetic.

The introduction these second-order cybernetic correctives to Etzioni’s original epigenetic taxonomy of performance variables transforms the functionalist framework, which treats organizations homeostatically, into an epigenetic cycle of organic development. Deutsch’s remarks on obstacles to learning in cybernetic systems are directly to this point. Specifically, he discusses “losses,” any of which can prevent effective learning. Since the inverse of such a loss is a capacity, he in fact enumerates six capacities that promote learning. It turns out that a different pair of these six capacities is related to each of the functionally defined external behaviors (threat systems, hierarchies, and goal definition and realization). Thus the three pairs of capacities are mutually exclusive; and collectively, they exhaust the set of six, as follows:

1. *Hierarchies* are inhibited primarily by “loss of capacity for fundamental restructuring” and secondarily by “loss of depth of memory.” Cognitive hierarchies are not internalized and organizational hierarchies are not imprinted in the absence of information and communication. These requisite capacities therefore depend most closely upon the *information/communication* performance variable, which is in turn most characteristic of the *initiation* phase of epigenetic development.
2. *Goal definition and realization* are inhibited primarily by “loss of steering capacity” and secondarily by “loss of capacity for inner rearrangement.” Goals are not defined or realized in the absence of motivation. The requisite capacities therefore depend most closely upon the *motivation* performance variable, which is in turn most characteristic of the *takeoff* phase of epigenetic development.
3. *Threat systems* are inhibited by “loss of power” and secondarily by “loss of intake channels.” Threat systems are at best ineffective, and at worst nonexistent, in the absence of competence. The requisite capacities depend most closely upon the *competence* performance variable, which is in turn most characteristic of the *spillover* phase of epigenetic development.

Theoretical structures of second-order cybernetics, outlined above, establish links between members of this conceptual triplet and the one immediately preceding. However, it would be inconsiderate to adduce supernumerary abstractions to such a demonstration, particularly in the presence of editorial limits on the length of this article. Therefore Table 5 summarizes those connections in apothegms unifying them with the fundamental analytical issues in the complex sciences, enumerated at the outset of the chapter.

<u>APPOSITE APOTHEGM</u>	(Second-order cybernetic) performance criterion and corresponding phase of epigenetic evolution		Complex-scientific category corresponding to the functionally defined behavior	
(Consolidated explication)	Epigenetic phase	Performance criterion	Manifesting complex-scientific behavior	Functional behavior
During the phase of <i>initiation</i>, information and communications <i>emerge</i> as [and manifest as cognitive and organizational] hierarchies.	<i>Initiation</i>	Information and communications	<i>Emergence</i>	Hierarchies
During the phase of <i>take-off</i>, motivation changes and stabilizes [and manifests as and <i>sustains</i>] goal definition and realization.	<i>Takeoff</i>	Motivation	<i>Autopoiesis</i> (for sustainability)	Goal definition and realization
During the phase of <i>spillover</i>, competence self-organizes [and manifests and <i>coheres</i> as] threat systems.	<i>Spillover</i>	Competence	(Self-organized) <i>Coherence</i>	Threat systems (for response to threat)

Table 5. Concordance between Categories for Assessing Institutional Development of International Organizations and Foreign-Policy Decision Making on the One Hand, and, on the Other Hand, Fundamental Issues in the Complex Sciences Enumerated at the Outset of This Article.

The Paradox of Intentional Emergent Coherence

The paradox of intentional emergent coherence is a condensation and a transformation of this first-order cybernetic system into a second-order cybernetic system. It is explicitly second-order-cybernetic and founded in the theory of complex systems. Consequently it operationalizes autopoiesis in particular better than any recitation of functional mechanisms. For an organization, autopoiesis is the crucial attribute marking the successful performance of functional tasks associated with the developmental stage of take-off. It signifies the capacity proactively to undertake relations with other organizations, as opposed to remaining only a coordinating center for actions of its own component organizational elements. It is the foundation of autonomous motive.

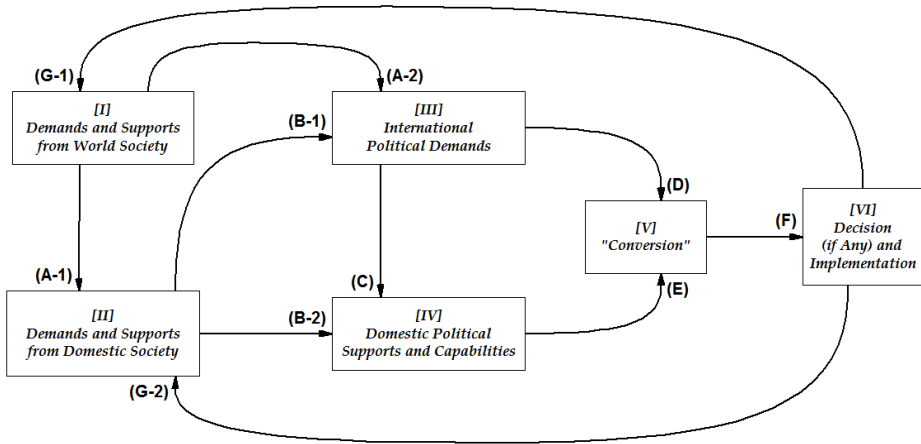


Figure 1. A Functionalism General-systems Inventory of Influences on State Foreign Policy Behavior.

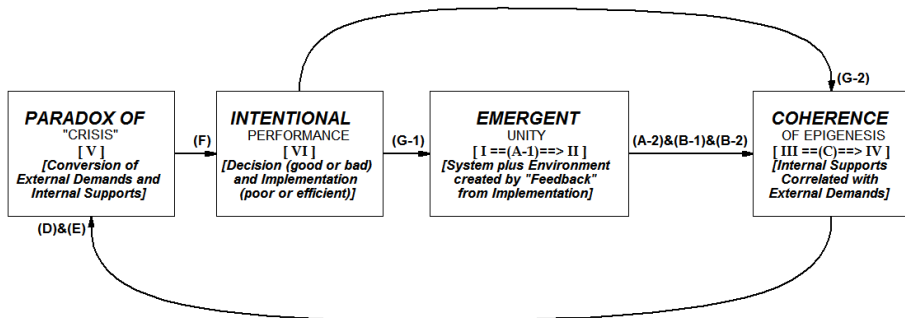


Figure 2. The Paradox of Intentional Emergent Coherence: A Cyclical Developmental Framework for Organizations and Social Systems, Unifying the Functional and Epigenetic Approaches.

Figure 1 portrays a standard functionalist general-systems flowchart of influences on the foreign-policy behavior of a state. Inspection will show that all “variables” (boxes with Roman numerals) and “causes” (labeled arrows) in Figure 1 appear also in Figure 2, albeit some in abbreviated form. [I], [II], and [III] represent the demands upon the political system and supports to it and their reciprocal intermeditation by (A-1), (A-2), and (B-1). Those three flows, together with (B-2) are seen in Figure 2 to represent the flow from [I] to [III], interpreted as transition from the phase of Emergence to that of Coherence, in turn represented in Table 3 as progression from Phase 0 to Phase 1. The movement from [III] to [V] in Figure 1 is the beginning of processing of information on the new

situation after it has been collected; “Conversion” is the structural-functional category identifying this process, and it is there intermediated by the flows (C), (D), and (E). In Figure 2, this represents the transition from Coherence to Crisis, as the new challenge begins coming to a head; and in Table 3, it is the progression from Phase 1 to Phase 2, where the crucial issue of motivation comes to the fore, especially along with associated second-order-cybernetic concerns with autopoiesis and goal definition.

The critical elaboration of a response (“Decision and Implementation”) is portrayed schematically in Figure 1 by the move from [V] to [VI] via (F), interpreted in Figure 2 as the resolution of the Crisis by Performance (either good or bad, and implemented either poorly or efficiently), and captured in Table 3 as the movement from Phase 2 to Phase 3. Finally, in Figure 1 for the case of state foreign-policy decision-making, there is feedback to the international and domestic political environments, i.e. from [VI] to [I] and [II], via the flows (G-1) and (G-2). These are also represented in Figure 2; for Table 3, it is the “relapse” from Phase 3 to Phase 0, awaiting a new situation of challenge to arise.

The progressive transformation of Figure 1 into Figure 2 demonstrates that the functionalist schema hides an organic cycle of epigenetic development. Indeed, forsaking the functionalist for the epigenetic standpoint in fact renders the schema more parsimonious with no sacrifice of analytical rigor; the analytical rigor is enhanced, as two conceptual consolidations transform the functionalist, first-order-cybernetic schema in Figure 1, so as to reveal its epigenetic, second-order-cybernetic essence in Figure 2. *First*: The epigenetic approach discovers that the endogenous demands and supports evolve with each metamorphic stage through which an organization passes; therefore, these demands and supports may be treated together as a single expression of the developmental stage that it has reached. *Second*: Conversion, decision, and implementation together constitute the response to the epigenetic challenge at hand; therefore, these may be collapsed to single category representing the organization’s performance-response to outgrow that developmental stage answer the self-transformative challenge to enter the next.²⁴

Conclusion

The basis for the two correspondences just enumerated is that the innovation and incorporation of procedures for the various kinds of

activities specified under “internal functions,” represent a response to a developmental challenge. Successful adaptation therefore represents the passage from one metamorphic stage to another, in the epigenetic course that inheres in the organization, whether it is a state or an international organization or any other social system. The assertion that initiation, takeoff, and spillover are not point discontinuities between different phases but rather are themselves transition phases in the life of the organization is validated by their specification as being composed of developmental functional tasks. The transformation of Figure 1 into Figure 2 discovers the ladder of epigenetic development concealed by the functionalist cycle and embedded in it. This ladder indeed conditions the very parameters of that functional cycle.

The transformation of the functionalist into the epigenetic framework demonstrates the intrinsic unity of the two approaches. It maps unambiguously the “internal functions” and the “stages of epigenetic development” onto a common domain. The complete ladder of institutional development is a hierarchy representing a typology of the *nature of the emerging units* (a category under the “sequences of integration” category of the epigenetic framework in Table 2). This correspondence integrates the principal category of the epigenetic framework with the principal taxonomy of the functional framework. The Paradox of Intentional Emergent Coherence unfolds as a result. Thus Table 5 sustains and illustrates, as was asserted in the beginning, that in the complex-scientific approach, autopoiesis intermediates emergence with coherence; and from that, the rest of this theoretical construct is generated and supported.

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2. Robert M. Cutler, “[The Emergence of International Parliamentary Institutions: New Networks of Influence in World Society](#),” pp. 201–229 in *Who Is Afraid of the*

State?: Canada in a World of Multiple Centres of Power, ed. by Gordon S. Smith and Daniel Wolfish (Toronto: University of Toronto Press, 2001), also at <http://www.robertcutler.org/ch01gs.htm>. International parliamentary institutions (IPIs) have widely varying origins and legal status but enough in common to permit a general developmental framework to encompass and permit comparison.

3. See, e.g.: Lloyd Etheredge, *Can Governments Learn? American Foreign Policy and Central American Revolutions* (New York: Pergamon, 1985); John A. Vasquez, "Foreign Policy, Learning, and War," pp. 366–383 in *New Directions in the Study of Foreign Policy*, ed. by Charles Hermann, Charles W. Kegley, Jr., and James N. Rosenau (Boston: Allen and Unwin, 1987); and, notably, *Learning in American and Soviet Foreign Policy*, ed. by George Breslauer and Philip Tetlock (Boulder, Colo.: Westview Press, 1991), as well as Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decision Makers* (New York: Simon and Schuster, Free Press, 1986). However, the discipline has only begun to recover from the methodological-individualist reduction of state foreign policy learning to learning by individual members of the decision making elite, by Jack Levy, "Learning and Foreign Policy: Sweeping a Conceptual Minefield," *International Organization* 48, no. 2 (Spring 1994): 279–312; see, e.g., Jeffrey W. Knopf, "The Importance of International Learning," *Review of International Studies* 29, no. 2 (April 2003): 187–209.

4. "Epigenesis" refers to a process whereby each successive stage of growth coheres with the basis for growth accreted from preceding stages.

5. Jean Piaget, *Le structuralisme* (Paris: Press universitaires de France, 1968); for a summary, see Jean Piaget, *Épistémologie des sciences de l'homme* (Paris: Gallimard, 1970), pp. 278–86.

6. Peter Winch, *The Idea of a Social Science and Its Relation to Philosophy* (London: Routledge and Kegan Paul, 1958); 2nd ed. (London: Routledge, 1990). For a commentary comparing the arguments in the two editions, see Philip Pettit, "Winch's Double-edged Idea of a Social Science," *History of the Human Sciences* 13, no. 1 (February 2000): 63–77.

7. Totality is thus as like a mathematical Object; self-regulation, an Operation; and transformation, a Relation. See Arthur F. Bentley, "Sociology and Mathematics" [first published in 1931], pp. 53–100, in Bentley, *Inquiry into Inquiries: Essays in Social Theory*, ed. with Introd. by Sidney Ratner (Boston, Mass.: Beacon Press, 1954), at 56–59.

8. Paul Cilliers, *Complexity and Postmodernism: Understanding Complex Systems* (London: Routledge, 1998).

9. Autopoiesis is the capacity of complex systems, and especially complex adaptive systems, to set their own goals through progressive interaction with their environment and through learning in response to this. John Holland, *Hidden Order: How*

Adaptation Builds Complexity (New York: Perseus Books, 1996); Niklas Luhman *Soziale Systeme: Grundriss einer allgemeine Theorie* (Frankfurt: Suhrkamp, 1984), translated as Niklas Luhmann, *Social Systems (Writing Science)*, trans. John Bednarz and Dirk Baecker (Stanford, Calif.: Stanford University Press, 1995).

10. Based on [Yaneer Bar-Yam], “NECSI Guide: About Complex Systems,” <<http://www.necsi.org/guide/study.html>>, accessed 10 October 2006.

11. Respectively: *The United Nations System: International Bibliography*, ed. by Klaus Hüfner and Jens Naumann (Munich: Verlag Dokumentation, 1976–present); and Amitai Etzioni, “The Epigenesis of Political Communities at the International Level,” *American Journal of Sociology*, 68, no. 4 (December 1963): 407–21, reprinted at pp. 346–58 in *International Politics and Foreign Policy*, ed. by James N. Rosenau, rev. ed., (New York: Free Press, 1969).

The Hüfner–Nauman taxonomy is based in the “structural-functionalist” school of political analysis, which emphasizes “capabilities” of a different nature than discussed here, and of which the *locus classicus* is Gabriel A. Almond and G. Bingham Powell, Jr., *Comparative Politics: A Developmental Approach* (Boston: Little, Brown, 1966), drawing heavily but implicitly on the *magnum opus* of Almond’s teacher Talcott Parsons, *The Social System* (New York: Free Press, 1951), which was unimaginably influential in its time. Parsons in turn was the chief American exegete of the great German sociologist Max Weber, whose attention to historical detail he however sacrificed for the gain of abstract conceptualization at the grandest level of theory. The resulting deficiencies (and they continue still today to affect organizational and foreign-policy analysis by many mainstream North American political scientists) are trenchantly laid out by the pioneering American sociologist William Foote Whyte, “Parsonian Theory Applied to Organizations,” pp. 250–267 in *The Social Theories of Talcott Parsons: A Critical View*, ed. by Max Black (Englewood Cliffs, N.J.: Prentice-Hall, 1961).

The issues that Etzioni outlines are not far from a the recent attempt in *Security Communities*, ed. by Emanuel Adler and Michael Barnett (Cambridge: Cambridge University Press, 1998), to revive the approach by Karl W. Deutsch *et al.*, *Political Community and the North Atlantic Area* (Princeton, N.J.: Princeton University Press, 1957), to the study of security communities. However, Etzioni’s framework better houses recent advances in social network analysis, including the important qualitative differences now rigorously demonstrated between triads and the dyadic relationships emphasized by methodological-individualist approaches; see, e.g., Ronald L. Breiger, *Explorations in Structural Analysis: Dual and Multiple Networks of Social Structure* (New York: Garland Press, 1991), and Stanley Wasserman and Katherine Faust, *Social Network Analysis* (Cambridge: Cambridge University Press, 1994); compare Barry Buzan and Ole Wæver, *Regions and Powers: The Structure of International Security*. (Cambridge: Cambridge University Press, 2003). At the same time, social network analysis conserves the systems-theory approach underlying Deutsch’s perspective and easily accommodates the cybernetic aspects of complex systems, as explained among others by Paul A. Stokes, “Socio-Cybernetics and the Project of Scientificization of Sociology,” pp. 311–334 in *Self-Steering and Cognition in Complex Systems: Towards a*

New Cybernetics, ed. by Francis Heylighen, Eric Rosseel, and Frank Demeyere (New York: Gordon and Breach, 1990).

12. For a more elaborate argument of some of these points, see Cutler, "[The Emergence of International Parliamentary Institutions: New Networks of Influence in World Society](#)" (fn 2).

13. For an example of how this synthesis generates a philosophically grounded and empirically applicable coding methodology for organizational development, see Robert Cutler and Alexander von Lingen, "[The European Parliament and European Security and Defence Policy](#)," *European Security* 12, no. 2 (June 2003): 1–20, also at <<http://www.robertcutler.org/ar03es.htm>>.

14. As Felix Geyer notes in "The Challenge of Sociocybernetics," *Kybernetes*, 24, no. 4 (1995): 5–32, another main difference as set out by Heinz von Förster was that "second-cybernetics explicitly includes the observer(s) in the systems to be studied [and] generally deals with living systems."

15. Compare Alicia Juarrero, *Dynamics in Action: Intentional Behavior as a Complex System* (Cambridge: MIT Press, 1999), pp. 109–25 *passim*.

16. David Easton, *The Political System* (New York: Knopf, 1953), and several subsequent monographs on the same theme.

17. Actually, elite studies have long been an identified topic within the comparative politics subdiscipline of political science, complete with its own problematization and definition of different elites. What an elite is, is nevertheless fairly clear in an ordinary-language way, whereas that is not necessarily the case for the concept of "regime."

18. David E. Apter, *Choice and the Politics of Allocation* (New Haven, Conn.: Yale University Press, 1971).

19. Lawrence C. Mayer, *Comparative Political Inquiry* (Homewood, Ill.: Dorsey, 1972), p. 136.

20. *Ibid.*, p. 127.

21. Karl W. Deutsch, *The Nerves of Government: Models of Political Communication and Control* (New York: Free Press of Glencoe, 1963), pp. 96, 210, 222. The transformation of goals held at the outset into goals not previously conceived is rare and cannot be programmed. Haas reserves the term "learning" for goal transformation, as distinct from "adaptation." See Ernst B. Haas, "Collective Learning: Some Theoretical Speculations," in *Learning in U.S. and Soviet Foreign Policy*, pp. 62–99, esp. pp. 72–97. Compare: James N. Rosenau, "Foreign Policy as Adaptive Behavior: Some Preliminary Notes for a Theoretical Model," *Comparative Politics* 2, no. 3 (April 1970): 365–387; Rosenau, *The Study of Political Adaptation: Essays on the Analysis of World*

Politics (London: Frances Pinter, 1981); Steve Smith, *Foreign Policy Adaptation* (Farnborough: Gower, 1981); Smith, "Rosenau's Adaptive Behaviour Approach." *Review of International Studies* 7, no. 2 (1981) pp. 107–26.

22. Richard W. Snyder, H.W. Bruck, and Burton Sapin, "Decision-making as an Approach to the Study of International Politics," pp. 106–170 in *Foreign Policy Decision Making: An Approach to the Study of International Politics*, ed. by Snyder, Bruck, and Sapin (New York: Free Press of Glencoe, 1962).

23. The italicized entries in the alternate cells in the left-hand column of Table 3 are taken from Robert Axelrod, "Schema Theory: An Information Processing Model of Perception and Cognition," *American Political Science Review* 67, no. 4 (December 1973): 1248–1266; compare Alessandro Bruschi, "Informazione e processi decisionali nel sistema politica," pp. 165–213 in Ministero degli affari esteri, Istituto diplomatico, *Relazioni internazionali: metodi e tecniche di analisi* (Florence: Centro Studi e ricerche di politica comparata, 1973); also the periodization of decision-making in domestic affairs by Peter H. Solomon, *Soviet Criminologists and Criminal Policy: Specialists in Policy-Making* (New York: Columbia University Press, 1978), p. 114, Fig. 1.

24. The successful implementation of a good decision strengthens these supports and develops new capabilities. A poor decision weakens supports, and a poor implementation (even of a good decision) stunts the development of new capabilities. Successes and failures are not isolated events but experiences that condition the whole of future evolution. For a discussion of this notion in relation to the development of domestic political systems, see Leonard Binder *et al.*, *Crises and Sequences in Political Development* (Princeton, N.J.: Princeton University Press, 1971); and *Crises of Political Development in Europe and the United States*, ed. by Raymond Grew (Princeton, N.J.: Princeton University Press, 1978).