Evolutionary institutionalism
New perspectives

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ABSTRACT.

BACKGROUND. Institutions are hard to define and hard to study. Long prominent in political science have been two theories: Rational Choice Institutionalism (RCI) and Historical Institutionalism (HI). Arising from the life sciences is now a third: Evolutionary Institutionalism (EI). Comparative strengths and weaknesses of these three theories warrant review, and the value-to-be-added by expanding the third beyond Darwinian evolutionary theory deserves consideration.

QUESTION. Should evolutionary institutionalism expand to accommodate new understanding in ecology, such as might apply to the emergence of stability, and in genetics, such as might apply to political behavior?

METHODS. Core arguments are reviewed for each theory with more detailed exposition of the third, EI. Particular attention is paid to EI's gene-institution analogy; to variation, selection, and retention of institutional traits; to endogeneity and exogeneity; to agency and structure; and to ecosystem effects, institutional stability, and empirical limitations in behavioral genetics.

FINDINGS. RCI, HI, and EI are distinct but complementary.

CONCLUSIONS. Institutional change, while amenable to rational-choice analysis and, retrospectively, to critical-juncture and path-dependency analysis, is also, and importantly, ecological. Stability, like change, is an emergent property of institutions, which tend to stabilize after change in a manner analogous to allopatric speciation. EI is more than metaphorically biological in that institutional behaviors are driven by human behaviors whose evolution long preceded the appearance of institutions themselves.

Key words: institutions, Evolutionary Institutionalism, institutional change, ecology

Institutions are studied in different traditions. Most prevalent in political science would likely be Rational Choice Institutionalism (RCI), followed by Historical Institutionalism (HI). Both traditions have their limitations. RCI is static. HI may misidentify a path's critical junctures. Neither presents an empirically sound explanation for institutional change. In this paper I attempt a reconciliation of these two traditions by revisiting and revising a third: Evolutionary Institutionalism (EI). This third tradition holds that institutions and institutional arrangements can, to a certain extent, be analyzed like genes and organisms. Consequently,

EI's foundational concept is the theory of natural selection, whose application within the discipline of political science is EI's innovation.

Here I will review EI's assumptions and claims, as made by other authors, adding illustrations and examples much needed in the otherwise quite abstract discussion of institutional evolution. Here also I will clarify the role of agency and structure and, citing a wide range of empirical cases, will argue for their integration as co-drivers of institutional change.

What is an institution? Definition is difficult, as illustrated by usage. According to Jepperson, institutions can include, for example, sexism, voting, handshakes, and armies.[1] This fuzziness of definition is also noted by Meadwell.[2] I will use the word "institution" to mean a rule that determines a form or function. An institution can therefore be a rule determining the number of

members in a parliament or a rule determining who in parliament is eligible to be elected to the position of speaker. Based on that definition, an institutional arrangement would imply a number of institutions linked together by meaning and purpose. A parliament or a constitution can therefore be institutional arrangements. Parliaments and constitutions are also, in an everyday sense, institutions themselves; my sense here, in contrast, locates true institutions more fundamentally in the rules manifested by parliaments and constitutions.

My research question is this: Should evolutionary institutionalism expand to accommodate new understanding in ecology, such as might apply to the emergence of stability, and in genetics, such as might apply to political behavior?

Critical aspects of Rational Choice Institutionalism

With RCI, several points of critique arise: First, RCI models games that are maximally approximated to reality.[3,4] Either it oversimplifies reality by giving actors a complete knowledge of all available strategies, assuming therefore completeness of information influencing the choice of strategy; or it remains intentionally ignorant towards available strategies, because they cannot be processed by the model.[5,6] Application of game theory to choice scenarios in historical contexts is problematic, since modeling *ex post facto* may assign to strategies weights that are different from those that actors would have assigned themselves; or the model may provide, from the *ex post facto* knowledge of the analyst, strategies that were not available to the actor.[7] Further, RCI is obsessed with equilibria; rules of the game are given by naming the actors, defining their strategies, providing a choice sequence, and specifying the actors' information. The consequence is a game in which the actors' strategies are channelled through and constrained by an institution so as to remain within a Nash equilibrium.[8] Thus no actor has any incentive to change strategy because institutional constraints raise transaction costs[9] to exceed the benefit of changing. Moreover, RCI cannot easily explain an institution's internal dynamics, its variation from other institutions, or its change over time.[10] In its pure form, RCI assumes too much objective rational decision-making ability: actors possess an entirety of information concerning a choice-scenario. This is simply unrealistic. The means-ends rationality of RCI is a static concept

wherein variation, adaptation, and change happen only through collective decisions.[11]

Critical aspects of Historical Institutionalism

The HI approach has some interesting aspects. HI analyzes empirical findings acquired by investigation of case-specific institutions and actors.[12,13] This does not exclude game-theoretic assumptions as such. Rather it applies such assumptions—that is, rule-based games with actors having strategies restricted through constraining institutions—to real situations without necessarily assigning numbers to pay-off matrices.[14] However, HI does take formal political, cultural, and social restrictions seriously. Formal institutions are usually represented by aspects of the polity—constitutions, legislatures, courts, governments, and such— while informal rules and procedures are often embodied in socio-cultural norms and values followed by unwritten, but often historically negotiated, agreement.[13,15] HI revolves around two core ideas: *critical junctures*, which were moments of uncertainty in history, and, following each critical juncture, *path dependency*, a locking out of all alternatives and a locking in of a single path toward some next uncertainty.[16,17] As sensible as this may sound, HI does attract criticism at some points. The first one is the critical juncture itself. Mahoney defines the critical juncture as having only two elements: a situation requiring a choice between two options or among more than two options, with only one option to be taken; and difficulty, increasing over time, when trying to revisit the point at which alternatives once existed and might again be considered.[18] How to identify a critical juncture is certainly HI's most pressing problem. The *ex post facto* nature of historical analysis means the set of alternative choices identified by a researcher may not have been available to, or been obvious to, an actor in the past.[19] The other point of critique is the locked-in nature of institutions during path dependency. As already mentioned, the transaction cost of changing institutions along a path exceeds the return expected from such a change. This lock-in effect makes institutions unrealistically rigid, overemphasizing received structure and de-emphasizing actors' adaptability.[20] Furthermore, it portrays change from within institutions as unlikely and relegates path-phase change to the universe of exogenous shocks powerful enough to create new critical junctures.[21]

Critical aspects of Evolutionary Institutionalism

The paradigm in which Evolutionary Institutionalism works is the theory of evolution, or more precisely, the Darwinian evolutionary theory (DET). The main tenets are well known across a broad audience but are often misinterpreted. The main point is not "survival of the fittest," where the fittest is the "strongest race," but survival of the best adapted species, the one able to produce more ultimately procreative offspring than species competing for the same resources. The most important aspects can be condensed to a triad consisting of variation, selection, and retention. Variation is a change from a previous state, and retention is a passing-on of said change. A change, as in a genetic mutation, occurs. That change is "selected" for any reason and retained through reproduction. Selection occurs through several mechanisms, the best known being sexual selection based on signs that signal attractiveness to potential mates. These signs can suggest reproductive fitness, can display a certain color, such as when coloration resembles a staple food, or can be random. A variation spreads through offspring, generation by generation.[22] Biological evolution follows no greater plan. The survival—the persistence—of a species depends on adaptive genetic mutation, which prospectively cannot be distinguished from genetic drift, and it depends as well on chance, which is to say luck.

This is, of course, a very compressed version of evolution. To get a basic understanding of what DET is in its entirety, one should read *On the Origin of Species* (1859) by Charles Darwin himself. Also essential are many other works, such as in genetics and systematics, appearing in the century-and-a-half since the *Origin*. Notable is Ernst Mayr's *What Evolution Is*[23] a comprehensive introduction to the history of evolutionary theory, the basic assumptions of evolutionary biology, and the mechanism of biological evolution. Stephen Jay Gould's book, *The Structure of Evolutionary Theory*[24] is a compendium that discusses the history of evolutionary theory and focuses on macro-evolution. An overview of genetic evolution is provided in Charlesworth and Charlesworth, *Elements of Evolutionary Genetics*[25] A significant contribution to the file on micro-evolution and the role of genes was made by Richard Dawkins in *The Selfish Gene*[26] in which book an analogy between the evolution of genes and the evolution of ideas was drawn in a serious manner for the first time. Attempting to reconcile biology

and sociology was Edward O. Wilson's mammoth and perennially controversial masterpiece, *Sociobiology: The New Synthesis*.[27]

The academics most important to the conceptualization of EI have been Werner Patzelt, with his contributions in *Evolutorischer Institutionalismus*,[28] which he edited, and Sven Steinmo and Orion Lewis, with their seminal works *Taking Evolution Seriously*[29] and *How Institutions Evolve: Evolutionary Theory and Institutional Change*,[30] Ian Lustick's *Taking Evolution Seriously: Historical Institutionalism and Evolutionary Theory*[31] which discusses the advantages of DET for political science and institutionalism, and the compendium *Introduction to the Special Issue on the Evolution of Institutions*[32] by Mark Blyth, Geoffrey Hodgson, Orion Lewis, and Sven Steinmo.

At the core of EI is an analogy between genes and institutions. As Dawkins had already proposed in *The Selfish Gene*, non-biological units may work in the same way as genes. Dawkins himself proposed a unit called a "meme," an idea that travels from brain to brain and transforms itself in the process.[33] EI transfers confirmed principles from evolutionary theory to political science, where they become putative principles. While the unit of change in biological evolution is the gene, the unit of change in political science is the institution. The gene and the institution both are rules that determine form or function. The aforementioned authors all accept this analogy.[34,35,36] This analogy presupposes that the triad of variation, selection, and retention transfers functionally to the political domain as well; or, as Lustick puts it, "Variation, selection and retention can occur wherever large numbers of competing elements operate overtime."[36] The triad in political science means that institutions are subject to change; that changes, however induced, might be selected, whether by decision makers or subordinates; and that, if selected, new institutions—new rules—are retained, whether explicitly or tacitly.

A critical discussion

It is important to keep in mind that variation, selection, and retention are just analogies. Institutions are not genes and cannot work exactly like genes. This caveat refers mostly to the sources of variation; ionizing radiation, for example, is highly unlikely to change an institution. Additionally, "randomness," as present in biological evolution, works only to a very

limited extent in institutions. While in biological evolution, variation—that is, mutation—is unintended and can therefore be considered random, in evolutionary institutionalism variation always relies on agency[34] and, therefore, intention. Granted, institutional changes may be unintended, unnoticed, or unwelcome and yet lack the randomness of a gamma-ray burst or a chance recombination of genes. Institutional changes, if noticed, can usually be traced to a cause and an action; in this sense, "randomness" in EI can either be excluded or rephrased as "unintended variation."

Variation, selection, and retention are, however, easily identifiable in institutional evolution. The most obvious example is legal reform, here shown in a simplified manner. A proposal for a legal reform is drawn up by either a government, a parliamentary committee, or a committee of experts; this would be the *variation*. A legislature votes in favor of the proposal, and it becomes a new law or a change to an existing law; this would be the *selection*. A variation becomes a selection and then survives successive legislative generations; this would be the *retention*.

Variation can, however, also occur less obviously via imperfect replication. Imperfect replication in a biological context simply means the loss of information, or the corruption of information, during the reproduction or recombination of genes. An imperfectly replicated gene varies from its predecessor gene. In EI, imperfect replication is an inconsistency in interpretation of institutional rules; the result is variation.[37] Institutions are most faithfully replicated by a literal adherence to them. That means every replicator—in EI, every individual affected by an institution—adheres to institutional rules in the same literal way. Such adherence is unrealistic, even undesirable.

Individuals, intra- and intergenerational, interpret institutions differently and subsequently replicate them differently.[34,38,39] This leads, of course, to slight variations in execution. Important to note, however, is that these re-interpretations are made by people directly concerned with the institutions in question. A bureaucrat during routine work may re-interpret a formal procedure, such as one described in a rule dealing with the assignment of tasks to other bureaucrats. The resulting procedure may be more efficient and may be adopted by other bureaucrats for their routine, leading to a variation in the formal institutional rule governing the procedure. Thus, a variation occurs through imperfect replication. Unlike the biological variant of imperfect replication, the EI variant has the aspect of

agency; the bureaucrat in question might not have realized the consequence of imperfect replication, but the subsequent adoption of the variation by others is a conscious decision, driven by, perhaps, a perceived increase in efficiency. Expanding the analogy into the social realm, we see that marriage is an institution that has been transformed through imperfect replication. Western societies began conceding that marriages could end in divorce, not just in death, that sexually fulfilling traditional marriages could optionally remain childless, and that same-sex couples revealing their wish to marry could rightfully claim civil protection and privilege.[40] This example is not relevant for formal political institutions as such, but it illustrates the mechanism. Imperfect replication has so far been considered as a driver of progressive change but could also cause change considered to be harmful. Remaining in the analogy between genes and institutions, damages in institutional "DNA" might occur; these damages might, considering the example of a bureaucracy again, inhibit administrative processes and subsequently give rise to harmful informal institutions, such as governmental corruption.

With mechanistic analogies in mind, we turn to scale and source, finding both illuminated by DET. *Scale* is studied at the macro-level, where larger changes affect whole institutional arrangements system-wide, and at the micro-level, where smaller changes affect a single institution or a small number of institutions.[41,42,43] *Source* identifies the origin of institutional change. In biological evolution the sources of variation can be a random recombination of genes or the influence of external factors, like radiant energy; the former would be an endogenous source of change, the latter an exogenous source.[41] A random recombination of genes must interact in an advantageous manner with other endogenous factors and with the environment to be an attractive trait for selection and retention. Likewise, the variation caused by exogenous radiant energy must on the whole be adaptive to be selected and retained; ultraviolet B energy (UVB) must make enough active Vitamin D in the skin without destroying too much folic acid there. However, institutional change seldom originates purely from one source but emerges from interactions among endogenous variations and exogenous influences, according to Lewis and Steinmo.[44] The interaction of endogeneity and exogeneity in many administrative services can be illustrated by the advent of e-governance: the delivery of government services by digital means, whether by the provision of forms and instructions via web-presence or direct communication

with public servants through e-mail and web-forms. The general increase in the level of education and subsequent recruitment of better educated people into the public bureaucracy led to an increased willingness and ability of bureaucrats to use modern information technology (IT) and communications systems. Small variations in institutional processes, sometimes as small as filling out forms at computer terminals and printing them, led to the computerization of most administrative processes. This endogenous change was coupled with an exogenous increase in economic pressure to provide services in an apparently more efficient way and in computer knowledge in the general populace and the acceptance and expectation of electronic communication channels as alternatives to surface mail and the telephone.[45] With a public bureaucracy mastering IT from within, initiating an institutional change, and a population willing and able to use IT for communication purposes, development towards e-governance was facilitated. The public bureaucracy evolved (and still evolves) from the analogue to the digital age. The integration of endogenous and exogenous processes in EI enables analysis that does not focus on economic advantages alone, like RCI is likely to do, nor does it place such important changes in narrow time frames, like the critical-juncture concept in HI does.

The endogeneity-exogeneity complex connects directly to the multi-level approach, which is present in both EI and biological evolutionary theory; instructive in this respect is Dawkins on genetic evolution[26] and Gould on large-scale processes and punctuated equilibrium.[24] The scale of change, whether happening at the micro-level or the macro-level is also not necessarily a dichotomy, but, depending on the focus of research, can be investigated individually. While micro-level analysis examines changes in day-to-day government business and the daily routine of institutions as induced by imperfect replication, macro-level analysis examines large-scale systemic changes as induced by environmental shock like climate events or war.[43]

On a micro-level, an example of endogenous institutional change can be found in the counting procedure used in German parliamentary elections. In 1985, the rule for distributing seats in the German parliament was changed from the D'Hondt[46] to the Hare-Niemeyer[47] procedure, both being mathematical models based on votes for directly elected constituencies and votes for party lists. The new procedure was adopted first, on suggestion of the mathematician Niemeyer, to estimate the allocation of committee seats in the Bundestag. Proving successful in counting votes and allocating seats accordingly, it was also adopted for the general election in 1987.[48] No exogenous pressures were operative, nor did the electoral system itself change, and the political parties forming the majority in the German parliament at that time realized no political gain. This was endogenous variation on a micro-evolutionary scale.

On a macro-level, changes arise usually from external social, economic, or political shocks and from large-scale events in the natural environment. Examples are easily seen. The transition from a monarchical to a republican form of government during the French Revolution was caused by a complex interaction of political, social, and natural factors, and this transition can be seen to have extended all the way to the creation of new states after World War II. At the very start, a combination of factors—the rise of the bourgeoisie, costly competition with other European powers, social discrimination, and a failed harvest stemming from climatic changes—can be identified as contributory and interactive causes.[49]

Agency and structure

Besides locating change within a spectrum of the micro and macro, the exogenous and endogenous, we must also identify preferences and the agency behind preference setting in EI. Agency is the capacity of an individual for conscious decision making; agency makes an individual into an actor, capable of setting preferences and able to pursue these preferences within the limitations of a surrounding structure, which is itself a composition of social, political, economic, technological, and natural factors.[50] The core idea is that agency and structure (institutions) are integrated and mutually interactive factors. Institutions structure agency, and, in turn, agency creates institutions. An important aspect of the way in which preferences become translated into institutions is preference complexity, manifested as the difficulty an analyst encounters when trying to identify sets of preferences by imputing utility and rationality to them. Preferences are set using information available within reference frames and are specific to temporal circumstances. De Mesquita and McDermott describe this phenomenon of preference setting as the "imperative of the moment," as an answer about the top preference depends on who is asking, what is asked, and when it is asked.[51] An employed individual may be

against tax-based social welfare because it might drive taxes higher. The same individual may be in favor of tax-based social welfare when he is unemployed and reliant on public assistance. Each preference is in itself highly rational, but each contradicts the other from the observer's point of view. Additionally, individual utility maximization, even within the constraints, can clash with preferences for a group's utility maximization. Because of preference complexity, agents will not have a coherent, consistent, and purely rational preference set. Influenced by frames of reference and temporal contexts, their preference sets will exhibit seemingly altruistic tendencies as well as clearly self-interested utility maximization.[52]

Preferences interact continually with political institutions, institutional arrangements, and environmental factors.[53] Preferences not only shape institutions; they also get shaped by them: political institutions and institutional arrangements put constraints on the preference sets that can be satisfied. Individuals are socialized in institutionalized contexts. Education, both formal and parental, socialization in peer groups, and access to information channels all influence the preferences individuals set for themselves and deem worthy to satisfy for others. The perpetual encounter of individuals with legal institutions plays another important role in preference formation. These institutions constrain preference setting for most individuals, although not all; serious deviation from this norm is treated as criminal behavior for good reason. To whatever extent criminal actors can satisfy their preferences by appropriating the possessions of others through stealing or deceiving or by harming health or life or by misbehaving in other ways, legal institutions interdict.

Environmental factors also influence preferences. Differences in geography lead to differences in preference setting. Individuals and populations living in small, isolated, and centralized villages might rank an employment opportunity in another town or a city as first among their preferences; an intra-village public transportation system might rank next. Here lies a big potential for further research in EI: the exploration of the role of natural factors, such as geographical position, in institutional change; a systematic approach to the ecology of political institutions might result. Population preferences, or "grassroots agency," might be modeled as a selection mechanism within the triad of variation, selection, and retention. Adoption and replication at this level can be vital for institutions, and institutional variations, legally selected, can suffer from

rejection at that level. Additionally, institutional variations of certain political or bureaucratic practices at the local or grassroots level may be selected through replication by population agency. For example a variation as simple as the improvement of information-policies regarding the availability of administrative services may satisfy preferences of a population and may be selected for replication for that reason. The power and thrust of individual and collective agency and preference setting is a most interesting aspect, distinguishing EI even from biological evolutionary theory. The integration of agency with institutional structures is remarkable in this approach, setting EI apart from other institutionalism approaches. Instead of viewing institutions as providing sets of rules in which agents "roam freely," as in RCI or HI, EI regards agents as intertwined with their institutional structures and able even to escape them or alter them. Powerful actors like the Indian Prime Minister Jawaharlal Nehru influenced the institutionalization of whole states, yet such actors are nevertheless the product of the institutional structures in which they were socialized. The modern Indian nation cannot be imagined without Nehru, and Nehru cannot be imagined without the institutions of the British colonial state. The point is that while other approaches, notably RCI, grant actors the ability to influence institutions, creating a dynamic equilibrium,[54] they do not account for institutions having structured the very influence being applied to them; EI allows for exactly that to happen. Additionally, EI allows agency to exert influence on institutions continually, even by asymmetric power as in the case of charismatic leaders; HI, limits such influence to critical junctures, when structures are weak and easily changeable. Institutional change is thus not at the mercy of agency, nor is it confined to narrow windows of opportunity in time, but it is continuous at the many levels where structure and agency influence each other.

Some less examined facets of EI

All in all, EI is an approach that organically integrates aspects of biological evolution with the distinctively human ability for conscious and strategic decision making. Through a multi-level approach and attention to endo- and exogenous sources for change, EI enables research on institutions by facilitating explanations of change that do not oversimplify choice scenarios or assume complete awareness of all facts in actors. There are still points, however, that need clarification, illustration,

and expansion. Ecology and ecosystems, institutional stability and population sizes, and biological factors in agency are such points. These are gaps to be probed. In them EI will be found either to have serious limitations or to offer new and instructive perspectives.

Ecology

Although Lewis and Steinmo do mention ecology and acknowledge the influence of ecological contexts,[55] the role of ecosystems is not spelled out. While acknowledging the role and importance of agency, ecological factors play a sometimes decisive role in large-scale changes.

What role do ecological factors play in institutional change?

Ecological factors are those that interact with the researched entity, in this case institutions. Together they build an ecosystem, which in a biological context keeps its standard definition.[56]

In ecosystems different factors, institutions, agents, and ideas interact and are to a certain degree interdependent. They constitute the immediate (interactive) environment of an object under investigation. Institutions occupy niches within ecosystems and interact with other institutions, with agents, and with ideas. Unlike, for example, in Historical Institutionalism, EI allows for factors and influences that are outside the usual perspective of political science. These factors include geography and geophysical conditions around institutions, including weather and climate in addition to classical factors like political and socioeconomic systems, demographics, armed conflicts, and individual or collective agency. By considering institutions as objects of investigation that are situated within a multitude of factors, the scope of research widens. Institutional evolution might sometimes be unexplainable within the small scope of variables exclusively taken from political and socioeconomic contexts, but it becomes understandable when looking at climatic changes or geophysical crises. To accept that institutions are historically grown and subject to more than political or economic forces is crucial for truly understanding institutional development and evolution.

An ecosystem comprises the immediate environment of an institution. It includes all factors that are not part of the institutional arrangement. Under the ecosystem, various factors can be subsumed: the political system and its leaders at national, regional, and local levels; economic, social, and geophysical conditions; and am-

bient ideas, including those associated with political thinkers.

Although Lewis and Steinmo do not write explicitly about the role of ecosystems for institutional success, they do provide an intriguing example of the connection between institution and context: the Westminster system.[57]

The Westminster parliamentary system has been introduced into a number of post-colonial states and has been regarded as a safeguard for democratic developments in these countries. Nonetheless this system has failed to meet expectations. None of the ten African states to inherit this system after decolonization employs the Westminster system today, either because democracy failed altogether via *coup d'états* or because parliamentary systems were reformed. The British system of representation simply did not fit into an environment that lacked economic development and had only a small educated elite that could make sense of it. A large majority of the citizenry of these states was unfamiliar with a parliamentary system that had long excluded them. The most prominent factors for failure of the British institutional legacy were political, economic, and social; missing were an established political class, an economic foundation to secure the working of the state, and an educated élite that, if only for selfish reasons, might have supported a parliamentary system. Other post-colonial countries managed to retain a Westminster-style system because the ecological conditions in the aforementioned areas were different. India, for example, had an established political class, active political parties, and an educated élite that supported the political system.

The success of institutions can, however, be closely connected to other ecological factors, like geography and climate, as the following will show. The debate within EI can be greatly enriched at this point by including insights from ecological studies focused on the interrelations of societies and their environments. One major contribution in this regard was made by Jared Diamond who discussed the rise and fall of different societies, historical and current, and the impact of environmental factors in their decline, as well as the effect of overpopulation on the societies' environments.[58] Historically the rise and fall of civilizations has been strongly correlated with such factors. The formation of the first kingdoms—in Egypt, in Sumer, and among the Indus Valley city-states—was closely dependent on their geographical location near great rivers with yearly floods

and clearly defined harvesting seasons.[59,60] These environmental factors made possible the creation of institutions governing taxation and the storage of crops, employment of peasants outside harvesting seasons, and so on. Likewise, climate has influenced institutional survival. The Maya city-states of the classical period could not retain their elaborate hierarchical kingship system after the stress of a modest drought.[61,62]

Even in more recent times, environmental factors can be identified as sources of high economic costs on societies. Ongoing environmental destruction in modern China, for example, brings an exceeding burden to the nation's economy.[63] But these environmental impacts are also observable in smaller institutional changes, which can be attributed to geographical and geophysical factors. For instance, the evolution of local government institutions in the Indian state of Assam has allowed for correlation between certain rules and regulations and the state's Himalayan altitude. In 1972, Assam changed its legislation covering local governments in favor of economic self-sufficiency, focusing on local resources, local production, and co-operative activities like farming and marketing.[64] Considering the position of the State of Assam in the Northeast of India, situated at a higher altitude comprising a few isolated valleys, an institutional focus on self-sufficiency appears to be a consequential adaptation. Interestingly, the preceding legislation on local governments in Assam had largely been influenced by political factors and agency. Backed by Nehru, the state had introduced legislation in 1959 based on recommendations of a central government committee concerned with local government and development. Political power was important, but so was economic opportunity, as the reform package included favorable development schemes.[65] An ecosystem-wide view helps make sense of evolutionary process, of agency, and of structure. To many researchers, especially those concerned with historical development, a contextual approach fully including natural events will feel familiar. What historically oriented researchers may still be missing, however, is a political-science approach systematizing context so as to situate an ecological niche within its ecosystem.

One might notice the absence of culture and religion in the previous passage. This is the case because such factors interact with political institutions through societies, through the rules and norms of social systems, and so should be included as constituents of socioeconomic systems. Religion for example might be strongly integrated into societal life and therefore might dictate many norms and rules, but it might instead be de-coupled from society. Societies and therefore social systems, however, are ever present.

In sum, ecological factors—political, socioeconomic, natural—interact powerfully in institutional change, acting usually on a macro-level, shaping the form and refining the function of institutions, and going far to effect variation, selection, and retention.

Stability

Explaining change means explaining its complement, stability, too. Political institutions are both the products of stability and its guarantors; they are designed both to be stable and to provide stability. But they also evolve, and many are explicitly designed to evolve, to maintain stability through change.

What might evolutionary institutionalism make of this? So far, not much. Demuth has suggested that stability within EI be seen in terms of institutional efficiency and adaptability, but stability itself has remained fuzzy.[66] That said, a change-and-stability model might be based on allopatric speciation: the generation of new species from the splitting of a conspecific population, whether by geography (*eg.*, a rising sea making hills into islands) or migration (*eg.*, a wandering band separating from its natal group) or dilution (*eg.*, a persisting troupe being separated from potential mates by the mass in-migration of an alien species).[67] In this model political institutions and institutional arrangements remain stable when the "institutional population" is large; for example, if the number of local government councils is large then variations are diluted by sheer numbers. For example, a multiplicity of valley cultures within Assam led to four major institutional changes between 1947, when India gained independence, and 1992.[68] Uttar Pradesh, an Indian state investigated in the same study, evolved more slowly during the same period; only one major institutional change occurred.[69] Assam and Uttar Pradesh differ in two major aspects: first, Assam is a geographically remote part of India with more extreme geophysical conditions, such as large mountainous areas and remote valleys, while Uttar Pradesh, though having mountainous areas in the northern parts, is dominated by plains and constitutes part of the Indian heartland. Secondly, Uttar Pradesh is much more populated than Assam and so has a much larger "population" of institutional arrangements; by 1990 Assam had 714 village councils while Uttar Pradesh had 73,927.[70] Stability also depends on the environmental factors that allow an "institutional population" to flourish.

This means external destabilizing factors, such as war, economic breakdowns, or ecological catastrophes are absent. The problem is how to define stability in this context. Stability—or stasis, as it is called in the punctuated equilibrium model[71]—in biological evolution is measured in generations and geological ages. Much shorter time-spans have to be used in EI. And what exactly must be defined as stable? A single institution, an institutional arrangement, or a political system? To address the second question first: stability must be defined at the level of institutional arrangements, but the rapidity of change possible in human-institutional interaction[72] makes a single definition there elusive, yet institutional arrangements can remain stable as a whole. One can compare this situation to genetic variation in humans; while human populations differ in genetic composition and may exhibit distinguishing phenotypic features, like dark or fair skin, all humans belong to the same species. Likewise, institutional arrangements can vary in certain aspects but belong to the same "institutional species." Local administrations in a country, for example, can have certain features in one district but not in another, due to imperfect replication, but still belong to the species of local administrations. The stability of institutional arrangements can be defined as the retention of basic features of that arrangement over a period. The basic definition should include, for political institutional arrangements, the purpose, the level of implementation, the rules of execution, the mode of composition, and the direction of accountability.

Considerably more complicated is the definition of the time frame in which one can describe an institutional arrangement as stable. Traditional definitions of stability, for example the equilibrium-based approach of RCI[54] and the approach of path dependency in HI,[17] are not fully compatible with EI. The concept that institutions are stable because they provide an advantageous cost-benefit balance or because the cost of transaction is higher than the expected utility does not work with institutions which are imperfectly replicated or where change can be endogenous and therefore independent from any actor-centered cost-benefit utility. In a very basic definition of democratic stability, democracy is described as stable if during two consecutive regime-changes via free and fair elections the losing party surrenders power and recognizes the victory of an opposing party.[73] This definition works best if the losing regime endured for its full term. For electoral institutional arrangements, such as executives, legislatures, or local councils, such a definition of stability

could work. However, for other institutional arrangements, such as bureaucracies or law codes, it would be impractical. Some bureaucracies or law codes, for example, are tied to particular technologies and cannot survive their displacement. However, with the inclusion of environmental factors in the definition of institutional stability, this dilemma can be avoided. Technological innovation, for example, as a driver of change, can be seen as a destabilizing environmental factor. Defining stability in temporal terms is not a promising approach. Instead, an institutional arrangement might be considered stable if imperfect replications are fewer than perfect replications. In light of the proposal to compare stability with allopatric speciation, this working definition would seem suitable.

Genetics

As a last point I want to touch upon the issue of biological factors, both in agency and in preference selection, led by this question: Is EI more than metaphorically biological? The answer is highly controversial amongst political scientists and biologists in general and geneticists in particular. Political scientists, remembering the follies of social Darwinism, have long tended to avoid the question. Some, though, taking genetic influences on politics seriously, have attempted empirical answers.[74,75] Studies that ascribe voting behavior in part to genetic factors[76] should at least be taken into consideration in EI when considering preference setting. At the same time political scientists should treat these results with caution. On the one hand studies like the one carried out by Fowler and colleagues, rely on surveys based on self-reporting by participants. These surveys suffer from issues like over-reporting, the self-ascription of non-voters to be voters.[77] This problem is addressed by several researchers, who either suggest that these studies yield no testable results[78] or that these studies are heavily biased but tend to work or can be improved to work.[79] The main problems in this kind of work are the technological infancy of research methods applicable to behavioral genetics[80] and the limited resource material with which to work. Nevertheless, research in this area might improve understanding of political behavior, preferences, and attitudes. Also interesting would be a biological approach to agency, especially in connection to political leadership: do certain strong political leaders exhibit different behaviors based on different neurological patterns? Can these patterns be traced to a gene or a group of genes? Investigating these questions might lead to a better understanding of why

some political leaders possess the agency to influence institutions and institutional evolution decisively. Again, the problem is the very thin technological foundation in this area, as well as a lack of experimentally testable samples; one would have to test the genetic code of a large number of political leaders considered to be strong and weak agents, something hardly pursuable.

In the end, one should remember that genetic research might provide certain inferences on dispositions of individuals and groups sharing certain genes but no more than inferences. Socialization, learning, and culture must not be forgotten in a rush to genetics.

To answer the question posed earlier, biology probably does play a role, but at the current state of research it is not answerable to what extent it does. Additional research is needed and will remain on the agenda for a long time. The additional research on genetic factors should be complemented by research on non-genetic factors; this is an approach that should be followed by EI researchers. Instead of having a debate over nature versus nurture, EI has to accept both, nature *and* nurture, into its set of explanatory variables.[52,81] Therefore it would be rewarding if political scientists, especially EI researchers, and biologists would come together frequently in large projects to further knowledge in this area. Both would be able to provide different points of view on issues like political behavior and preference setting, subsequently complementing each other's expertise.

Conclusion

My research question I can now answer, but in two parts. Yes, evolutionary institutionalism *should* expand to accommodate new understanding in ecology, such as might apply to the emergence of stability. But, no, evolutionary institutionalism should *not* expand to accommodate new understanding in genetics, such as might apply to political behavior. Why not? First, because that understanding remains preliminary. And, second, because it will at best apply to individual rather than systemic behavior. Genetics will remain no more than metaphorical for EI.

Political scientists would do well to study Evolutionary Institutionalism in addition to, but not instead of, Rational Choice Institutionalism and Historical Institutionalism. These paradigms should not be treated as competing or conflicting. As distinct theories they do appear incompatible, but in truth they are complementary. They complete each other.

Rational choice is an element of thorough EI research, and rational preference setting is, of course, a crucial part of agency in EI. Institutional evolution can be influenced by estimating transaction costs to find an optimal institutional setup. Institutions may solve collective-action problems and maximize gains for a maximum number of involved actors. Granted, RCI research has a number of shortcomings, such as a lack of empirical evidence outside western contexts, its willingness to ignore counterfactual empirical evidence in order to produce generalizable results, and its oversimplification of cases for the sake of fitting those cases into a model.[10,82,83] RCI is on its own insufficient to explain institutional developments in many cases. As an element of EI, however, rational-choice concepts can be used where evidence supports them, but when evidence does not conform to rational choice predictions elements unique to EI might be able to explain observations.

HI is, again, a useful approach in many respects. Taking historical contexts seriously and researching the historical dimensions of institutional change are indispensable, as are critical-juncture and path-dependency concepts. The unconditional surrender of the Third Reich in 1945 was a critical juncture, and the subsequent partition of Germany created a path; these events fit neatly into HI's explanatory model. But even this approach is not without criticism; the *ex post facto* nature of HI means a set of alternative choices identified by a researcher might not have been identified by an actor facing what may or may not have appeared to be a critical juncture. Even more difficult is identifying a critical juncture which did not lead to change. Is it possible *ex post facto* to identify alternative choices fairly? Maybe not.[84,85,86] Still, as with RCI, HI can be considered a constitutive element of EI. While insufficient as stand-alone approaches, the three together can explain a lot.

By including the insightful aspects of RCI and HI into Evolutionary Institutionalism, one avoids an unnecessary debate. Rational preference setting and historical context are natural elements of the ecosystems of institutions; they fit into the general explanatory variables of EI without creating a patchwork of theories.

The value added by Evolutionary Institutionalism is not the formulation of a new theory; it is the opposite, the integration of a much tested and successful biological theory into political science. The theory of evolution has been accepted in many disciplines ranging from biology to linguistics and has provided a

research framework in which many problems could be addressed successfully. In political science, EI can deliver similar success by integrating established approaches, RCI and HI, with ecological research, especially investigating the role of geophysical conditions, climate,[87] and geography, and even biology itself. EI as an integrated, consistent and comprehensive approach is able to provide explanatory variables for institutional evolution and change; this is where other approaches fall short. It takes agency seriously without becoming entirely actor-centric; it acknowledges structures without overemphasizing them. Nevertheless, more empirical research from an EI perspective is needed.[88,89] A consistent methodology has to be developed and many theoretical issues have to be sorted out, especially in the areas discussed in this paper. Cooperation between political science, psychology, neural sciences, and genetics could be rewarding. In the end, politics is the attempt of human beings to organize themselves in order to secure their survival. It stems from a biologically based desire. That is why political science should acknowledge its relation to the life sciences and should take the evolutionary approach seriously.

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