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A notion evolving: From 'institutional path dependence' to 'intellectual path dependence'

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Abstract

How do ideas evolve? Can one speak of scientific progress when there is more than one pathway of intellectual evolution in which different ideas emerge and flow in different directions? Is the history of economic analysis a compilation of a number of intellectual pathways? This essay argues that it is possible to understand the course of history as a number of overlapping, divergent, and endlessly changing pathways. Such pathways operate in different fashions. They sometimes lead to more coherent and higher levels of understanding. And sometimes they delay or obstruct advancement in intellectual history. In both cases, outcomes are unpredictable and multi-directional.

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1 Introduction

How do ideas evolve? Can one speak of scientific progress when there is more than one pathway of intellectual evolution in which different ideas emerge and flow in different directions? Is the history of economic analysis a compilation of a number of intellectual pathways?

This essay aims to respond to these questions in terms of the theory of path dependence and to qualify the argument of the evolution of (economic) ideas by way of debating the significance of epistemic costs, academic networks, and speech acts and metaphors in the history of ideas. Path dependence in intellectual history or *intellectual path dependence* means that the initial conditions of certain ways of thinking sometimes lock us in to particular pathways. Such pathways occur when the consequences of small events irreversibly catch intellectuals in their complex web and are amplified over time. The distinctive property of such conditions is that the evolution of ideas does not necessarily lead to any predefined end point. "Historical small events" (Yalcintas 2006) trigger shifts in the course of events and this leads to positive or negative consequences that move the system away from its systematic course. After small events take place, complex webs of scholarly life function in one of the following ways: (*i*) as a short-cut that moves the system to a better state and elevates it to higher levels of order which could only be reached within longer time spans if there had been no interruptions or (*ii*) as a hindrance that breaks the system down and disallows intellectuals to proceed further and achieve scientific progress. When historical small events become a hindrance (*ii*), a small uncorrected error sometimes feeds back a negative cumulative effect on the progress of scientific knowledge. When they operate as a short-cut (*i*), however, the conditions that turn an event into a starting point of a new pathway can be the breaking point of an old one such that they unlock the old course of events bearing path dependent properties and perhaps lead to more complex evolutionary pathways. This would mean an upward movement of the system to more coherent and sophisticated levels. Within intellectual paths, setting a new start in motion is not easy (and sometimes impossible) for a number of reasons. Such impossibility could be a chance for improvement (that is, further sophistication) of the evolution of ideas; however, the direction of the evolution of events after such bifurcation points depends completely on the conditions that take place afterwards.

The notion of path dependence in economics was originally applied to the historical evolution of typing machines. Paul David argued in his seminal article, "Clio and the Economics of QWERTY" (1985), that the keyboard layout in digital keyboards used in modern computers and other electronic devices today was in fact designed to reduce the speed of the typist. This "inefficient" keyboard layout was introduced in order to generate a working solution to a practical problem of clashing and jamming of the mechanical parts of old typewriters. As the typist was slower in typing texts, the number of clashes and jams was reduced. Therefore, the typist could type more and longer. However, modern computers, laptops, and other electronic devices do not have such problems. Digital keyboards nevertheless have used QWERTY as the standard layout. The industry was locked in to an "inferior" technology that obstructed progress in typing technologies. A solution was passed on to next generations despite the fact that the problem did not exist anymore.

The story in this article has soon become a 'famous fable' in social sciences (Spulber 2001: 90-109; Liebowitz and Margolis 1990). Following David, economists such as Brian Arthur (1989, 1994), Douglass North (1990), and Paul Krugman (1991), among many others in other branches of social theory (Goldstone 1998, Mahoney 2000, and Pierson 2000), have contributed to the research on path dependence. Today, many thinkers, with or without calling it path dependence, are expressing similar concerns about the specificity of evolution of

social, economic, and political institutions. The common concern of these thinkers is that no evolutionary process necessarily evolves toward a pre-defined end point. In order for a process to feature a property that allows a specific process to evolve toward a pre-defined end point, a 'legitimate trend' should cause events to evolve in the prescribed way. However, there is no such final term to each and every evolution. There is no prearranged result for all that exists in nature and society. Exact references where this conception is discussed include John Dewey (1910a: 50 and 67; 1910b: 118 and 124), William James (1971), Larry Hickman (2004: 95), and Joseph Ratner (1999: 30-31).

Path dependence research also includes works about the 'tangled pathways of history' (Collins *et al.* 1999), the institutional history of thinking systems (Graff 1987) and 'evolution of vocabularies' that have been locked in to specific paths (Ocasio and Joseph 2005). John D. Sterman and Jason Wittenberg (1999), departing from Kuhn's argument (2000: 104), claim that 'small changes … can have large-scale effects' and state that 'self-reinforcing processes amplify intrinsically unobservable micro-level perturbations in the environment – the local conditions of science, society, and self faced by the creators of a new theory – until they reach macroscopic significance.' In a similar fashion, Albert Jolink and Jack Vromen (2001) argue that scientific knowledge and procedures are vulnerable to lock-in effects and multiple self-reinforcing mechanisms. Members of the scientific community use each others' results, build upon each others' work, and seek out recognition and prestige among their peers. Many publications discussing the significance of path dependence in management sciences, organizational action, and economic geography (Foss 1997; March 1996; Duhs 1998; Martin 1999) also use the notion of "intellectual path dependence" and yet most (if not all) of these publications lack a pleasing conclusion about the lessons to be drawn from the general evolution of intellectual institutions such as universities, sciences, and the scholarly methodologies and vocabularies that scientists have long used in order to communicate with each other. Conceptual and methodological works on path dependence (Cowan and Gunby 1996; Balmann *et al.*1996; Dutt 1997; Rizello 1997; Arrow 2000; Puffert 2003; Gartland 2005; Heikkila 2010; Vergne and Duran 2010) overlook the issue as well. Organization theorists, doing research on the problems of knowledge in firms and organizations (such as Nooteboom 1997; Schreyögg and Sydow (eds.) 2010, Garud and Karnøe (eds.) 2010), provide valuable insight into the processes of knowledge creation (or "path creation") but they, too, do not specifically discuss the significance of path dependent evolution of ideas in intellectual history.

Based on one of the most commonly used metaphors in evolutionary economics, path dependence, this essay attempts to reconsider, at least partially, the meaning of scientific progress in the history of ideas. The significance of this reconsideration lies in the fact that the evolution of ideas does have a propensity to increase the variety and sophistication of scientific knowledge whereas this process does not always operate in ways in which "old" theories are falsified and replaced by "new" theories. Scientific progress could have been achieved if there were only one pathway of evolution in which ideas are accumulated so as to form a larger stock of knowledge. However, scientific inquiry is a non-terminative process which requires curiosity over social and natural issues, not necessarily calculating the future consequences of the research. Since there are often multiple pathways, heading in different directions, motivating diverse groups of scholars in various ways over time, it is not possible to argue for a teleological end towards which scientific communities strive even when scholars, for instance, make every effort to "reveal truth." The absence of an endpoint in the evolution of ideas is not an argument against the capabilities of the members of scientific communities; rather, it is that efforts of scientific communities do not simply add up. Several selection mechanisms, networks, and contingencies, among many other factors, make scientific processes more complex as each and every small interaction has the potential to

cause remote and multiple consequences. Intellectual path dependence claims that progress can only be achieved locally and temporarily, insofar as the evolutionary history of ideas is concerned, whereas intellectual history is richer in terms of the amount of variety and sophistication among theorems, ideas, and viewpoints.

2 Towards an Evolutionary History of Economic Ideas

Paul David, writing on the problems in the evolutionary history of technology, argues that disappointments in 'the advance of technology' have common elements with the disappointments in 'the advance of knowledge' (David 1990). 'I am unable to find any compelling reasons,' David also writes, 'why economic analysis should remain "locked in" to an ahistorical conceptual framework, apart from the unfortunate hysteresis effects of "intellectual sunk costs" … [S]ome injection of further, intellectual "energy" is likely to be necessary in order for our discipline to free itself from the logical region of "low potential" in which it has too long remained trapped' (David 2001: 18). What are the sources of disappointments that accompany the 'advance of knowledge'? Why does economic analysis remain locked in to an ahistorical conceptual framework?

Intellectual path dependence suggests that some of the problems in epistemology may have economic aspects alongside philosophical ones, if and when problems of theory selection, paradigm shifts, and correction of errors are also economic in deeper layers of their nature (Radnitzky 1987a). One of the distinguishing features of an evolutionary history of economic ideas is that there are path dependent circumstances in the intellectual history of economics. Intellectual path dependence, from an economic point of view, claims that paths and dependencies come about as a result of high opportunity costs of applying or using alternative methods (Radnitzsky 1987b; Wible 1998; Fallis 2005). Scholarly life is not only socially constructed; it is economically constituted as well.

The economic character of questions in epistemology, which are traditionally considered to be philosophical in nature, underscores the questions of persistence and change of institutional structure in economics. The scholarly life of economists is a "positive epistemic costs" world (Yalcintas 2012) in the sense that universities and research institutes produce ideas for science in which the high epistemic costs of pursuing science require institutional scientific arrangements (such as awareness of fraud and plagiarism, definite codes of behavior, etc.) to cure the effects of spillovers (or 'negative externalities') that may come about as a result of scientific effort. Universities and research institutes minimize the costs that arise out of risk aversion in scientific markets as well as negotiate contracts with researchers and other scientific institutions. The expenses of conducting science have principally consisted of (*i*) investing capital required to start up and run a research project, research center etc. and (*ii*) the time that must be allowed for scholars to do research. In fact, problems of optimizing costs (and benefits) have never stopped occurring in science since science meant 'organized knowledge' in the sixteenth century or even earlier. In the world of 'increasing returns to scientific scale,' so to speak, the higher the pay-offs the higher the funds raised by government and other research institutes to finance a research project. The reason for this is that science has long ceased to operate like a local, small scale *atelier*: it has become expensive to pursue scientific research in universities and research institutes since new technologies, such as computers, require more capital-intensive investment. Further, the production of knowledge is more and more subject to the harmful consequences of the irresponsible behavior of scholars.

Intellectual path dependencies transform the (apparently) simplistic idea of the growth of scientific knowledge into a complex conception. Social networks among intellectual elites, collaboration among research institutes, funding opportunities, the role of the government,

and different streams of thought cause variations in communication patterns among scientists. Intellectual networks are one of the most important factors of intellectual causation determining the outcome in scholarly life. Randall Collins argues in his *The Sociology of Philosophies: A Global Theory of Intellectual Change* (1998) that intellectual causation explains how solidarity groups survive the challenges of scholarly life. He shows that interaction among intellectuals is dense and it intensifies even more when participants of a scholarly community feel that they are parts of a particular community. In scholarly communities, intellectuals use specific bodily motions. They perform within certain speech acts. They also use particular metaphors to communicate. Such symbols make borders among different communities more visible, determining who is in and who is out of the scholarly conversation.

Survival of a community depends on the (re-)assembling of the participants on regular basis in terms of time and occasion. Symbols (i.e. bodily motions, speech acts, and metaphors) constitute the genes of a scholarly community. Genes act as the 'moral force' of a scholarly conversation and determine the scope of the conversation: 'it charges up individuals like an electric battery, giving them a corresponding degree of enthusiasm toward ritually created symbolic goals [even]when they are out of the presence of the group' (Collins 1998: 23). Scholars' attachment to the symbols sets the standards for the validity of ideas within the community. Social activities of a community (such as lectures and formal debates) turn individual scholars using such symbols into members of the community. The 'truth' arises out of the 'interaction rituals' of intellectuals.

Scholarly communities operate in repetitive patterns, reinforcing the ties between the scholars. Messages conveyed among community members in social activities are discussed, repeated, and augmented every time individuals take part in a debate. Interaction rituals generate intellectual commitments among members and these commitments constitute and strengthen the social density of the 'repertoire of symbols' that determine the depth and scope of the content of a conversation. Symbols have a life. As symbols are circulated more and the sophistication in their meaning increases, there is a higher chance that they become 'parents' to a greater number of 'offspring' symbols. Symbols reproduce across generations of conversations in which creative members of the community produce large amounts of work. Large amounts of work do not always add up to more creative ideas but they mean better chance of survival for the symbols to which creative members are attached. The survival of a symbol depends on the degree of agreement on ideas which are crystallized in a symbol. That is to say, symbols get established when ideas that are expressed in these symbols are circulated among the community widely. As ideas make their way through different intellectual networks, there is a better chance for a symbol to become an instrument in the creativity of the scholars. Symbols spread far and wide by way of circulating ideas that are socialized among the whole intellectual community.

However, new ideas do not often replace old ones. This phenomenon has much to do with the institutional conditions in which ideas emerge, struggle for survival, and spread. Epistemology, as a consequence, often turns away from answering old questions and occupies itself with its own arena of dispute. Philosophy, Collins reports, re-digs its foundations and does not always 'move forward.' In other words, ideas do not evolve by way of displacing other ideas.

3 Conclusion

John Dewey once wrote that '"Truths" in philosophy are in fact only systematized mistakes and prejudices of our ancestors. Many of them originated in accident; many in class interest and bias, perpetuated by authority for this very reason' (Dewey 1950: 50). The notion of

intellectual path dependence supports, at least partially, the point that Dewey made more than 60 years ago. Indeed, many philosophical problems are products of the unconscious adoption of assumptions built into the vocabulary in which the problems were stated. We inherit philosophical problems; in other words, we think erroneous thoughts without questioning the assumptions that caused the problems. These assumptions are mainly due to the unfortunate mistakes and confusions that are jammed into us after the writings of Descartes, Locke, and Kant (Rorty 1979: 357). An important issue here is nevertheless that although such errors abound in intellectual history, there are a great many important achievements from the past. For instance, it is not wise today to look up Adam Smith to read the best theory of the division of labor. Sophisticated versions of the theories of the eighteenth and nineteenth centuries are printed in many economics textbooks. The idea of government today is much more sophisticated than it was when Plato first wrote about it. In other words, there has been considerable progress in the sciences, philosophy, and the arts. Boulding's question, in this sense, is very intriguing: after Paul Samuelson who needs Adam Smith? (Boulding 1971).

It is a critical error, however, to ignore the historical past of economic science as if there were a single path of institutional evolution headed toward perfection (of theorems). Economists have incorrectly assumed that whatever knowledge economics departments produce will immediately add positively to the body of economic science. But good ideas are sometimes initially completely ignored. Some texts, which were not considered important at the time they were first published, come to the forefront of economic theory years after their publication. And sometimes, an error remains uncorrected for a long time (Yalcintas 2011). This shows us at least one thing: progress of scientific knowledge does not at all times follow a single path headed towards a predefined end point. An evolutionary history of ideas can then provide us with better explanations as to how ideas 'really' evolve.

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