

**ACTOR-NETWORK THEORY AND ORGANIZATIONAL FORMING:
AN AMODERN PATH DEPENDENCE PERSPECTIVE**

ABSTRACT

The organizational theory literature has identified the emergence and evolution of organizational forms as a critical issue to be addressed, yet new ways of looking at organizational form have yet to be addressed and there are concerns about the largely ahistorical and aprocessual character of much organizational theorizing. While path dependence, as conventionally conceived, presents an avenue for overcoming the lack of historical contingency in mainstream organizational theories, it does not maintain an opening for *forming*. Here is where actor-network theory comes in to not only argue that organizational *forming* is ongoing, but also show how it is made unrecognizable by our modes of theorizing. Of particular interest to this framing is the re-articulation of path dependence as a constructivist endeavor, incorporating the concept into actor-network theory through its reconsideration as ‘irreversibility’.

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Taking the view that “[w]here new organizational forms come from is one of the central questions of organizational theory” (Rao, 1998: 912) and has been since Weber’s (1946, 1947) formulation of the ideal-type bureaucracy, I seek to address some of the concerns with extant ways of theorizing the organizational. As noted by Donnelly (2007), the literature has identified emergence and evolution of new organizational forms as a critical issue to be addressed, often presenting the issue as being driven by ‘new times,’ yet what is more evident in the literature is that the need for new ways of looking at organizational form, be it ‘old’ or ‘new,’ has yet to be addressed. It has also raised concerns about the largely ahistorical and aprocessual character of much organizational theorizing, and lamented the dearth of empirical work that is historical and processual in character. Linking the concerns of both Daft and Lewin (1993) and Zald (1993), I seek to contribute to the discussion through incorporating process and history to help us understand organizational form(ing), both old and new, in so doing following through on the argument for knowing the organizational as an ongoing process.

Pursuing calls to develop more historically informed theory implicitly raises metatheoretical questions about extant approaches to understanding organizational form. In what follows, I address these questions, first, by proposing that the organizational theory literature in its quest for “form” requires to be periodized as a modernist endeavor that seldom reflects on its own creations, and, second, by re-inserting history into this argument, I suggest an approach to move out of some of the literature’s current limitations.

I turn to the notion of path dependence, in recognition of the calls for more historically informed organizational theory. I explore the limitations of *modern* thinking generally and posit the need for a new framework that will facilitate both problematizing and studying “organizational form” in a manner that moves beyond thinking in terms of boundaries and essences towards a more processual way of thinking. I argue for abandoning modernity in favor of adopting a way of thinking, a metatheoretical framing, that facilitates conversing differently about what we currently call ‘organizational form.’ In elaborating on this framing, I explore the tenets underpinning conventional thinking about these issues, with a view to exposing their limitations and clarifying the grounds on which an alternative approach might be possible.

Of particular interest to this framing is the incorporation of path dependency into actor-network theory through Callon’s (1991; 1993; 1994; 2005) reconsideration of the concept of “irreversibility” and the intellectual contribution an actor-network approach can offer by way of viewing organizational form(ing) as a materially heterogeneous relational performance rather than a sequence of temporally ordered and causally connected events. When reconsidered under this approach to irreversibility, path dependence has potential in contributing to an (a)modern perspective towards issues of “organizational form(ing).”

PROBLEMATIZING MODERNITY

While differing views on organizational form have emerged, they very much involve a particular way of understanding, in line with what Cooper and Law (1995: 263) refer to as a ‘distal theory of organizations.’ They have emerged from a macro organization theory perspective concerned with the creation and maintenance of boundaries, with categorization and classification and with the very notion of ‘form’ itself. The view from the existing literature, coming as it does from a largely determinist and positivist perspective, limits understanding

through establishing the world as external to cognition, collective action or experience, rendering organizations as “hard, tangible and relatively immutable structures” (Burrell & Morgan, 1979: 4), completely determined by their environment and knowable through a search for “regularities and causal relationships” (Burrell & Morgan, 1979: 5).

Consistent with this way of understanding, the perpetually dynamic is placed into a field of stasis and stabilized for the purpose of scientific study (Burrell, 1996), such that organizations appear as static entities capable of being partitioned out and classified. Current ways of understanding also both lock into, and are locked in, such dichotomous thinking as micro/macro, inside/outside and new/old. The notion of ‘form’ itself, being a noun, conjures up the sense of something that is always-already ‘formed,’ of something that has shape, of something static, of a mode of existence or manifestation. Hence, to study form, as understood in this light, is to study something that already ‘has form’ or has essence.

In short, the same theories, tools, and ways of understanding, which were developed to analyze notions of the organizational at a particular time, namely bureaucracy, and in a particular way, namely ‘ideal types’ arrived at through social ‘science,’ are being deployed in attempts at generating knowledge about the organizational in ‘new times.’ Concurrently, theories, definitions and classification systems are used in the literature, and espoused as definitive means for studying form, even though, as discussed in this chapter, their use is the subject of ongoing debate over how to theorize, define and classify form. Essentially, then, in being obsessed with classification, which is the only way they assume it is possible to know “organization,” dominant organizational theories continue to privilege “form” over “forming.”

“Can we think any other way” (Calás & Smircich, 2003: 49), such that we do not become enmeshed in, and continue to reproduce, the problems we encounter when thinking in a modern

way? There seem to be some possibilities within contemporary thinking. As I now move on to discuss, path dependence presents an avenue for overcoming the lack of historical contingency in mainstream organizational theories.

PATH DEPENDENCE – INCORPORATING HISTORY AND PROCESS

In a criticism that can also be applied to mainstream organizational theory in general, Kieser (1994: 612) notes that sociologists, in favoring grand theories that bother little with historical details that disconfirm their theories, would be seen by many historians “as people who state the obvious in an abstract jargon, lack any sense of differences in culture or time, squeeze phenomena into rigid categories and, to top it all, declare these activities as ‘scientific’.” Given the inferior position they accord history, Kieser (1994) calls for the abandonment of models that are conceptualized separately from that which is to be explained, in favor of analyses that are more interpretive and inductive, i.e., integrationist. For those of an integrationist position, the concern is with activating the potential of history to enrich organization studies through both employing and challenging its social scientific counterpart: “Ultimately, the issue is how do we *combine* a positivistic programme of theoretical and empirical cumulation with the enriching possibilities of the humanities” (Zald, 1993: 516, emphasis in original). In similar vein, Kieser (1994: 619) proffers that “[h]istorical analyses do not replace existing organization theory; they enrich our understanding of present-day organizations by reconstructing the human acts which created them in the course of history.”

Thus, an integrationist position recognizes that current organizational forms have been shaped by past events and that their course of development has been influenced by the broader context. More specifically, an integrationist position entails interest in “processes of

organisational change, development of organisational forms and variations across societal settings, path dependencies and continuities in organisational ideas and practices” (Üsdiken & Kieser, 2004: 323).

In recognition of the calls for more historically informed organizational theory, I now turn to the notion of path dependence. To be clear, pitching itself between ahistorical organizational theory and atheoretical history, path dependence is as much embedded in modernity as other mainstream approaches to doing organizational knowledge. Nonetheless, as I explain later, bringing in path dependence through an integrationist position as my entry point allows me to suggest a way to escape the modernity of conventional approaches to “organizational form(ing).”

Path dependence – an idea through which “history” is commonly made visible – emerged as an alternative perspective to ‘conventional economics’ in the 1980s through the work of David (e.g., 1985, 1987, 1994, 1997, 1999, 2001) and Arthur (e.g., 1988, 1989, 1990, 1994). Path dependence refers to dynamic processes involving irreversibilities, which generate multiple possible outcomes depending on the particular sequence in which events unfold. The path dependence approach holds that a historical path of choices has the character of a branching process with a self-reinforcing dynamic in which positive feedback increases, while at the same time the costs of reversing previous decisions increase, and the scope for reversing them narrows sequentially, as the development proceeds. As already noted by David (2001: 23), “the core content of the concept of path dependence as a dynamic property refers to the idea of history as an irreversible branching process.” Similarly, Hacker (2002: 54, emphasis in original) argues that “path dependence refers to *developmental trajectories that are inherently difficult to reverse.*” Thus, preceding steps in a particular direction induce further movement in the same

direction, thereby making the possibility of switching to some other previously credible alternative more difficult. “In an increasing returns process, the probability of further steps along the same path increases with each move down that path. This is because the *relative* benefits of the current activity compared with other possible options increase over time” (Pierson, 2000: 252, emphasis in original).

Those who are not familiar with the path dependence approach think that it is no more than recognition that “history matters.” However, the approach not only recognizes the impact of history, but also shows that a decision-making process can exhibit self-reinforcing dynamics, such that an evolution over time to the most efficient alternative does not necessarily occur. In general, path dependence refers to situations in which decision-making processes (partly) depend on prior choices and events. It recognizes that a decision is not made in some historical and institutional void just by looking at the characteristics and expected effects of the alternatives, but also by taking into account how much each alternative deviates from current institutional arrangements that have developed in time. An outcome thus depends on the contingent starting point and specific course of a historical decision-making process.

Antonelli (1997: 661) attributes the emergence of path dependence to the failure of existing economic models to handle the dynamism and complexity of path-dependent processes, with Arthur (1990: 99) distinguishing between ‘conventional economics,’ which largely avoids path dependence, and the ‘new positive feedback economics,’ which embraces it. From an initial interest in the emergence of new technologies, path dependence arguments have since become prevalent in such areas as the spatial location of production, regional studies, the development of international trade, institutional sociology, political science and policy studies (Donnelly, 2007). More recently, path dependence has entered into strategy (e.g., Booth, 2003; Brousseau

& Chaves, 2005; Maielli, 2005; Mueller, 1997; Nerkar & Paruchuri, 2005; Rao, Vijaya & Peter, 2004; Stack & Gartland, 2003, 2005; Teece, Pisano & Shuen, 1997) and organization studies (e.g., Araujo & Rezende, 2003; Bruggeman, 2002; Donnelly, 2007; Greener, 2002; Heffernan, 2003; Noda & Collis, 2001; Schmidt & Spindler, 2002; Sonnenwald, 2003; Sydow, Schreyögg & Koch, 2005).

Booth (2003) notes that path dependence has only recently entered organization studies due to the analytical problems encountered by existing approaches in accommodating the complexity and dynamism of path-dependent processes. Our existing organizational theories fail to address how what we have come to identify as a given organizational form has been achieved in practice. Different to structural contingency, institutional, ecological and transaction cost theories, and in pursuing a more integrationist approach (Üsdiken & Kieser, 2004), path dependence activates the potential of history to enrich study of the organizational generally. In pursuing a more processual and historical approach to studying the organizational, path dependence is not replacing existing organizational theory; rather it can help enrich our understanding of present-day organizations by reconstructing the process through which they came to be, shaped by their past and influenced by their broader context.

Thus, through the concept of path dependence, there is now the possibility to move beyond ahistorical organizational theorizing. In the opinion of Hirsch and Gillespie (2001: 87), “Path dependence deserves credit for bringing history back into analysis [...] stimulating economists and other social scientists to address the limitations of their largely ahistorical models.” It seeks to assess how process, sequence and temporality can be best incorporated into explanation, the focus of the researcher being on particular outcomes, temporal sequencing and the unfolding of processes over time.

However, notwithstanding the contribution of the path dependence perspective, and its potential in facilitating the study of “forming,” it does not help in showing how “form” has come to be privileged over “forming.” To all intents and purposes, path dependence operates within a modernist worldview. While it recognizes that accidental and contingent factors play a role in the initial stage of path formation, it nonetheless seeks to explain subsequent path dependence through the macro-causal reasoning of self-reinforcing and/or reactive sequences (Mahoney, 2000). Later on I go back to this point and reconsider path dependence, nonetheless, in a different mode, which may make it a step to get out of this impasse; yet, in order to do so the modernist worldview must be reconsidered. For this purpose, I enroll now an actor-network theory (ANT) perspective through the work of Bruno Latour.

HAVE WE EVER BEEN MODERN?

Latour (1993) offers another analysis of “the modern condition.” In his view, modernity involves the creation and maintenance of two distinct ontological zones (see Figure 1 below), with all that is nonhuman ascribed to nature and all that is human ascribed to culture. Accordingly, the work of scientists is focused on one zone or the other, treating the world according to either the authority of the natural sciences, on the one hand, or that of the social sciences, on the other. In either case, the work of scientists is to explain, to purify, the world they see in their terms. Those coming from the perspective of nature, the realists, seek to naturalize society by integrating it into nature, while those coming from the perspective of culture, the constructivists, seek to socialize nature through digestion by society (Latour, 1993).

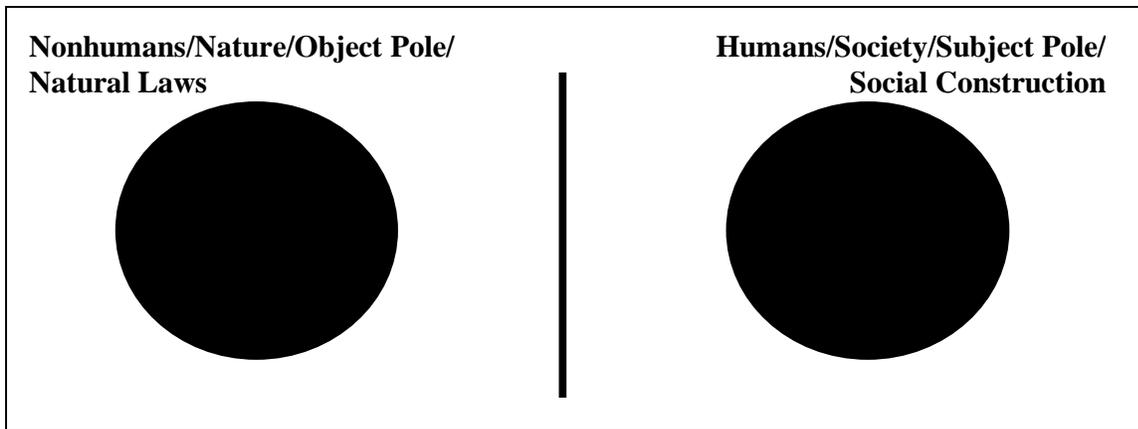


Figure 1: Modernity according to Latour (adapted from Latour, 1993: 11).

Hence, looked at through the lens of the natural sciences, all that has to do with organization is governed by natural laws. Looked at through the lens of the social sciences, it is we humans who create organization according to our own free will. Accordingly, organization is either transcendental, having an existence ‘out there,’ or it is immanent, having an existence ‘in here,’ and great effort is expended in ensuring that both views remain ontologically pure – e.g., paradigm “wars.” Nature deals with things-in-themselves, while culture deals with humans-amongst-themselves, such that people and things, humans and nonhumans are kept separate.

At the same time, and without apparent contradiction, modernity treats nature as immanent in the sense that its laws are mobilizable, humanizable and socializable, in essence, knowable, through manipulation by the modern knowledge-making apparatus (e.g., laboratories, questionnaires, experiments, statistical analyses, research organizations, scientific institutions). Accordingly, the laws of nature can now be discovered, such that organization can be known, albeit they still remain transcendent. Similarly, culture is simultaneously treated as transcendent in the sense that it has its own laws and outlasts us, with conventional ways of knowledge-making “stak[ing] out the limits to the freedom of social groups, and transform[ing] human relations into durable objects that no one has made” (Latour, 1993: 37). Hence, our freedom to

create organization according to our own will is circumscribed by the laws of society, albeit these laws are our own creation.

Escaping Modernity?

Viewed from this perspective, modernity provides no means of escape from ‘old’ ways of thinking and knowing and so provides no useful avenue for articulating and studying the organizational differently, for modernity is part and parcel of the way organizations have been conceptualized and studied. Thus, how can we articulate and study the organizational differently? I argue that one way around this impasse is to imagine, as Latour (1993) has done, that we have never been modern. His amodern (or nonmodern) thesis rests on exposing, and then tying together, the practices that underpin modern ways of thinking and knowing. By making these operations visible, he provides a way to reconsider our understanding about “organization.”

Purification, Translation and Networks

As already discussed, having created two separate ontological zones, modernity’s focus remains on maintaining that separation. As such, to be modern is to be concerned with maintaining the established purity of nature on the one hand, and of society on the other: to be modern requires engaging in the practice of *purification*. Such practice, in turn, requires *categorization and classification*, with things-in-themselves assigned to nature and humans-in-themselves assigned to society.

Thus it is that, through purifying, *forms* can be identified. They can be classified and categorized according to an abstract set of features (e.g., environment, structure, authority-control, decision-making, workers, operations, core/non-core, communication, culture, etc.), such that they are rendered static, permanent, timeless, universal and, above all, knowable. In

being purified, they become ideal-types against which to measure and verify that which pertains to them. But the question is, in order to purify, what has the knowledge-making enterprise left out? Thus, to focus on the practice of purification is only part of the story, for there is another practice, that of translation, on which modernity depends for its existence and yet which modernity denies at the same time.

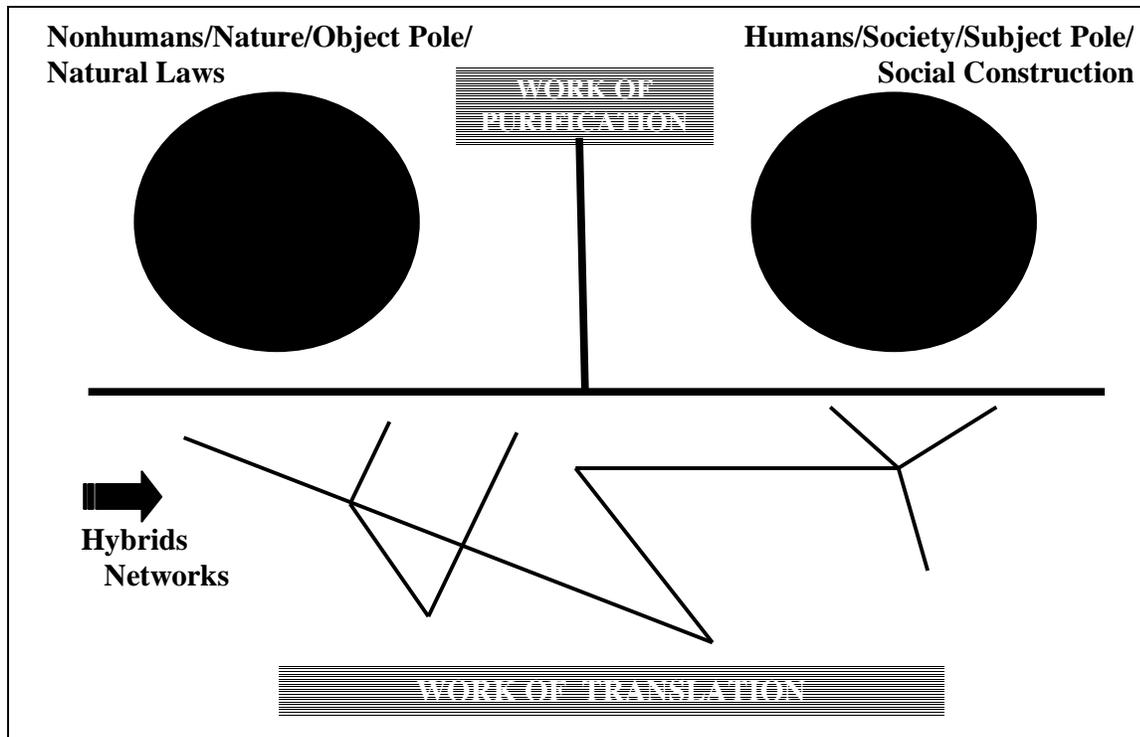


Figure 2: Latour's amodernity (adapted from Latour, 1993: 11).

Concurrent with purifying the messy world in which we live, modernity engages in translation (see Figure 2 above). Here, far from separating humans from nonhumans, their contacts are amplified, mixing together humans and nonhumans, without bracketing anything and without excluding any combination, in the process creating hybrids of nature and culture in the form of networks of humans and nonhumans. Different from the practice of purification, which involves separation, the practice of translation involves the threading together of any or all of these actors into a network that makes sense. It entails interconnecting these heterogeneous

elements and viewing them as performing relationally, as interacting to produce what we contingently call organizational form, with one actor seeking to redefine the meaning of the other actors, enrolling them into a position, such that its interests also become theirs.

What results from the practice of translation are hybrids, networks that are both contingent and emergent. They are contingent in that their relations are never fixed for all time, such that the actor-networks could come asunder should the interests of any actors diverge. Similarly, they are emergent in that they do not appear ready formed, as pure essences that always-already existed.

However, this very practice, the practice of translation, is denied any visibility or acknowledgement within modern thinking. While the flexibility and fluidity afforded by the modern way of thinking is facilitated by the work of translation, for it is here that humans and nonhumans are threaded together to form a network that realizes the everyday, it is not until this network of associations achieves some degree of relative stability that it becomes amenable to purification, and thereby that it becomes visible for classification. Purification reclaims the network from the hybrid ontology of its formation, and renders translation invisible in the process. Thus, purification obtains in the case of organizational form when we no longer think of the diverse materials that go into its performance, but, instead, simply see it as a thing in and of itself. Purification is successful when the threads that bind these heterogeneous materials relationally fall out of view and are simply taken for granted.

Translation and Purification – Exposing Modernity’s Dichotomy

In summary, both practices, translation and purification, are vital to constituting the world we live in, with one dependent on the other. Without the practices of translation, those of purification would be without meaning, for we would be dealing with nothing but pure forms

with no possibility of these forms being combined to arrive at some new form. Likewise, without the practices of purification, those of translation would be hindered, restricted or discarded, for without pure forms we would have nothing to thread together to create new forms.

However, with its emphasis on knowing through purification, modernity takes hybrid networks formed through translation and cuts them into “as many segments as there are pure disciplines” (Latour, 1993: 3), severing the ties that link nature and society. For example, in our case dealing with the organizational, we deal with the topic through the lenses of economics, psychology, sociology, anthropology, communication, computer science, business, and so on. We go even further within each discipline, segmenting further as, for example, in the case of business where we use the lenses of marketing, organization studies, finance, accounting, management science, and so on.

And we go yet further, as with organization studies, for example, with the focus breaking into strategy, organizational theory, organizational behavior, international management, human resource management, and so on. And we could go yet further again, if we were to look at the various theories within organizational theory, for example, as was done in the previous section. Thus, the network of threads and links that go into constructing the organizational become severed to form neat compartments such that what we notice of the organizational is only behavior, only employees, only social context, only products, only consumers, only transactions, only contracts, only balance sheets, only technology, only computer modeling, and so on.

Through this separation, even though imbroglios of humans and nonhumans are multiplying and proliferating, the distinct ontological zones remain steadfastly separated and delimited from each other as if the world were divided into such neat categories, into which anything and everything could be easily slotted. Being truly modern, therefore, requires that we

regard the practices of purification and translation as separate, while at the same time subscribing to the work of purification and denying that of translation. To do otherwise, to attend to both at the same time and to acknowledge the proliferation of hybrids, is to question our modernity and to make us “retrospectively aware that the two sets of practices have always already been at work in the historical period that is ending” (Latour, 1993: 11).

It is through recognizing the work of translation that Latour (1993) unveils modernity as but one half of a configuration that denies its other. It is through recognizing, and legitimizing, the practices of translation as necessary to those of purification, and through recognizing both, together, as a distinct, coherent and mutually reinforcing configuration, that it is possible to recognize that we have never been truly modern. As I discuss next, this argument has important implications for the study of “organizational forms.”

A DIFFERENT WAY OF THINKING

As we have seen, modernity initially emerges from the conjoined creation of humans-culture and nonhumans-nature, and then masks its own creation through treating each source separately. Meanwhile culture-nature hybrids, though denied, continue to proliferate. However, it is precisely this very ability to separate humans and nonhumans, while at the same time denying the creation of hybrids, that weakens modernity and bolsters Latour’s amodern thesis. In proposing such a thesis, Latour seeks to retain modernity’s ontological zones and its practices of purification and translation, only this time both practices are to be considered as operating simultaneously, and not separately.

For instance, if we look at how bureaucracy is talked about in the literature we see that it is comprised of various purifications: a stable environment; a hierarchical structure; authority

that is centralized, command-and-control, directed by top-management; workers that are dependent, controlled, trained to follow orders, costs to be minimized; operations that are vertically integrated, employ standardization and has its own workforce; work that is organized according to task specialization; boundaries that are fixed and static; communication that is vertical, formally passing through the hierarchy; and so on. These various categories for classifying bureaucracy are themselves purifications. Centralization, for example, is premised on authority, decision-making and control residing in top management, with the latter comprising people, positions, titles, offices, subordinates, expertise, reports, and so on. But, what is missing from here? The assumption is that bureaucracy is always the same and never deviates from comprising all of the actors noted. However, this overlooks that the slightest change to the list of actors associating with bureaucracy translates the latter into a hybrid. For example, is a bureaucracy that outsources some of its tasks to a service provider in a low-cost country, using information and communications technologies to create a seamless operation, still a bureaucracy or is it something else? To all intents and purposes, while all else has remained the same, the bureaucracy's fixed and static boundaries have changed and it no longer does everything in-house employing its own workforce: the bureaucracy actor-network has been translated. As such, we are not dealing with a bureaucracy, as classified, but with a hybrid that is neither a bureaucracy nor a virtual organization. It is something other for which there is no name.

It is in this light that the “proliferation of hybrids thus denies the success of purification and, therefore the possibility of having ever been modern” (Calás & Smircich, 2003: 51). Hence, the double separation between humans and nonhumans, on the one hand, and between the work of purification and that of translation, on the other, needs to be reconstructed (Latour, 1993). In making visible the work of translation, therefore, any analysis would be rethreading the many

bits and pieces that go into making the organizational, thereby regaining the complexity of the ties that bind the organizational together.

Following Latour, then, I adopt a metatheoretical position, my ontological starting point, that considers that the networks that weave the organizational together do exist and that our modern ways of knowing have provided us with but a partial, essentialized, and static understanding of what we currently conceive as organizational form. It is also from this position, as I will soon explain, that path dependence returns to my analysis.

Rethinking “History as Progress” – From Modern to Amodern Temporality

Modernity’s sense of time passing comes through always seeking to break with or abolish the past and leave it behind. The moderns separate themselves from their past through “Copernican revolutions, epistemological breaks, epistemic ruptures so radical that nothing of the past survives in them” (Latour, 1993: 68). In so doing, they sense time as an irreversible arrow, as progress. This experience of time as a revolution, always having to start over again, can be seen in the treatment of organizational form in the literature. For example, Miles et al (1997) contend that a particular organizational form has been a feature of each major period in business history. In the period since the Industrial Revolution, they suggest, the United States has moved through the machine age, with its hierarchical, vertically integrated organization form, to the information age, and its network form, and is now at the threshold of the knowledge age, with what they call the cellular organizational form.

For Latour (1993: 72), modern temporality is “outlined by a series of radical breaks, revolutions, which constitute so many irreversible ratchets that prevent us from ever going backward.” Given this conception of the passage of time, and in conjunction with calendar time, modernity’s irreversible arrow presents but two options in ordering time: forward for progress, or

backward toward stagnation/regression. The moderns treat the return of the past as archaism, for to treat it otherwise would be to undermine the temporal ordering and the sense of time passing: the arrow of time is unambiguous, such that moving forward requires breaking with the past, while moving backward requires breaking with the modernizing effort. Latour (1993) suggests that modern temporality has little effect on the passage of time. He argues that the past not only remains but also returns, with the practice of translation mixing up humans and nonhumans of different times. A good example of temporality is the debate of recent years within the organizational literature surrounding bureaucracy (Donnelly, 2007). There are those who suggest that bureaucracy is outmoded, a thing of the past, and that post-bureaucracy has taken its place. However, there are others who see bureaucracy continuing, such that, in Latour's terms, the past is mixed with the present to create hybrids that become purified, for example, Ashcraft's (2001, 2006) 'feminist bureaucracy.'

When consideration is given to the work of translation and to hybridization, modernity's essences are exposed as being no more modern than they are revolutionary, for they are seen as blends of different periods, ontologies and genres. Modernity's temporal order becomes disturbed such that "a historical period will give the impression of a great hotchpotch" (Latour, 1993: 73). Rather than an irreversible, ordered, continuous and progressive flow, time becomes reversible, turbulent and more akin to a whirlpool than a linear flow, such that "every contemporary assembly is polytemporal" (Latour, 1993: 74).

For modern temporality to function, "the impression of an ordered front of entities sharing the same contemporary time has to remain credible" (Latour, 1993: 73). Counter-examples and exceptions cannot be allowed to proliferate for this would undermine the temporal order and render talk of stagnation, regression, and archaism impossible. There could be no

break with the past. In recognizing the work of translation and the proliferation of hybrids, modern temporality falters and becomes untenable for it is anything but homogeneous.

Latour (1993) sees time as a contingent outcome of the relational performance among entities, not as a general framework. He suggests that it is necessary to pass from the temporal ground on which modernity (and its antimodern and postmodern critics) operates to another, which incorporates seeing that temporality, in and of itself, has nothing temporal about it. Modern temporality is but a contingent effect, the result of a performance that, through purification, “reassembled, hooked together, systematized the cohort of contemporary elements to hold it together and thus to eliminate those that do not belong to the system” (Latour, 1993: 74-75). Purification has always operated, classifying essences as belonging to different times, but “[i]t is the sorting that makes the times, not the times that make the sorting” (Latour, 1993: 76, emphasis in original).

For instance, if we take as our analytical starting point the year an organizational form becomes generally accepted, we can trace the process of sedimentation through time, such that the year the form became generally accepted “is formed of as many segments as there have been years since” (Latour, 1999: 172). This process of sedimentation is unending, with each year contributing to, including challenging or revising, the actor-network that has grown from that initial point of general acceptance. For Latour (1999: 172), the issue is one of “treating extension in time as rigorously as extension in space. To be everywhere in space or always in time, work has to be done, connections made, retrofitting accepted.”

From an amodern perspective, therefore, there is no break with the past, rather it is “revisited, repeated, surrounded, protected, recombined, reinterpreted and reshuffled” (Latour, 1993: 75), such that the past permeates the present. Labels such as “archaic” or “advanced” are

unnecessary as a modern temporality recognizes that the work of translation brings together heterogeneous actors from all times; it recognizes polytemporality. It is from this perspective that I now turn back to path dependence.

TOWARDS AN AMODERN WAY OF UNDERSTANDING PATH DEPENDENCE

As discussed before, path dependence moves beyond rational choice analysis – which suggests that institutional development is a product of adaptation to an institution's environment, where the array of options is unlimited and the only issue is that of assessing the advantages of each option – by countering that options are often a function of time and sequence, in addition to environmental conditions, such that history matters as much as knowledge of contemporary conditions. However, path dependence has been criticized for subordinating agency to historical accidents through its emphasis on explaining the role of temporally remote events in shaping or determining the present and the future (Stack & Gartland, 2003).

Countering this, advocates of path creation (e.g., Garud & Karnøe, 2001) seek to emphasize the role of human agency in shaping and interacting with the environment, rather than view lock-in as either a historical accident or a random event. However, both path dependence and path creation lead us back to a modern way of understanding: e.g., determinism versus social constructionism, and dichotomous thinking, such as, macro/micro, structure/agency.

Moving away from a modern understanding of path dependence, I draw theoretical and methodological insights from Callon's (1991; 1993; 1994; 2005) acknowledgement of the historicity and durability of actor-networks through his reconceptualization of the concept of irreversibility. Callon's argument about irreversibility allows for a reconsideration of path dependence in the language of ANT.

ANT, Irreversibility and Path Dependence

Irreversibility relates to the historical continuity of particular actor-networks and the extent to which they shape future processes of translation. Irreversibility, produced through the multiplication of connections and the weaving of alliances and relations, describes the evolutionary process in which a network passes from a state of flux and divergence to one of strong stabilization and the disappearance of problems through closure. Closure can be deemed to have taken place when the punctualized actor-network renders itself indispensable to other actors, becoming an obligatory point of passage (Callon & Law, 1982) in a larger network of actors. The greater the irreversibility in a network, the more stable ‘norms’ we might expect to find in place; explanations of events and their causes become stabilized, and these shape the ‘frames’ which actors use to determine future events.

Callon (1991) posits that the degree of irreversibility of a translation is contingent on two factors: (1) the degree to which it is possible to return to a point where the translation in question is but one among many; and (2) the degree to which the dominant translation both shapes and determines future translations. In defining it thus, Callon is asserting that the irreversibility of a translation is a relational matter. Translations, he argues, no matter how secure they appear, are notionally reversible, and the only way to measure their irreversibility is to put them to the test. Further, translations are open to challenge by competing translations and their irreversibility when facing such assault lies in their durability and robustness, which are also relational properties.

As Callon notes, actors are hybrid groupings of heterogeneous materials facing the continuous threat of internal dissension. As such, no translation is assured of permanence. However, irreversibility can be said to increase to the degree that every actor “is inscribed in a

bundle of interrelationships” (Callon, 1991: 150, emphasis in original), where “strength is the outcome of a long process of accumulation, weaving of alliances and relations, from micro-positions constructed first as little gaps or differences lodged in the interstices of existing configurations” (Callon, 2005: 12). Seen thusly, attempts to redefine, and so change, an element in such tightly coupled networks would result in a general process of retranslation. This leads Callon to propose the following: “the more numerous and heterogeneous the interrelationships the greater the degree of network co-ordination and the greater the probability of successful resistance to alternative translations” (1991: 150). However, a translation’s robustness and durability says nothing about how it shapes and determines subsequent translations. Here, Callon argues, a translation is irreversible where it engenders further “translations that are intended to prolong its life or extend its scope” (1991: 150-151).

For Callon, the mechanism of normalization, which both accompanies and measures the degree of irreversibility of translation, serves to make

a series of links predictable, limits fluctuations, aligns actors and intermediaries, and cuts down on the number of translations and the amount of information put into circulation. It operates by standardising interfaces – that is, by standardising and constraining actors and intermediaries ... [– a]nd if the relationship between actors is normalised, it may contribute powerfully to the production of systemic effects. This is because its elements are only able to rearrange themselves by making use of well-defined elements which adopt compatible standards. The stricter the compatibility rules ... the more alternative translations are disqualified and the more predictable choices become. A network whose interfaces have all been standardised transforms its actors into docile agents and its intermediaries into stimuli which automatically evoke certain kinds of responses. The rules of co-ordination then become constraining norms which create and control deviance: *the past engages the future*. In a word, irreversibilisation, taken as the predetermination of translation and as the impossibility of a return to competing translations, is synonymous with normalisation. (1991: 151, emphasis mine)

Accompanying normalization is the potential for the establishment of norms or standards: the greater the precision and quantification of norms and standards, the greater the irreversibility of a successful translation. Hence, Callon suggests, a “network which irreversibilises itself is a

network that has become heavy with norms ... [and] slipped into a codified metrology and information system” (1991: 151). Taking irreversibilization of translation and its normalization together renders it possible to posit that challenging certain translations would prove expensive. A successful challenge would entail undoing existing translations and constructing new ones through mobilizing and enrolling actors into new networks.

For instance, the example of the QWERTY keyboard illustrates how both path dependence (David, 1985) and ANT (Bowker & Star, 1999: 13-14) treat irreversibility. Seen through a path dependence lens, both accident and contingency were at play at the outset followed by increasing returns in QWERTY winning out (David, 1985). Bowker and Star (1999: 13-14) mention QWERTY in outlining several dimensions of standards. In the same way that path dependence stresses accident and contingency at the outset, Bowker and Star acknowledge the accidental and contingent character of standards in noting “there is no natural law that the best standard shall win” (1999: 14). However, Bowker and Star’s concern is not only with the origins and lock-in of standards, but also with their consequences, with the work they do as information infrastructures, with the inner workings that go into keeping them invisible and making them work like “magic,” with the work they do in ordering human interaction, with challenging the silences surrounding these workings. From an ANT perspective, QWERTY emerged as a standard not because of positive feedback mechanisms, but because sufficient actors have continuously been mobilized and enrolled to the QWERTY actor-network to withstand challenges and render it irreversible. From the manual through the electric typewriter, the QWERTY keyboard has since become indispensable to such things as computers and touch-screen airport check-in kiosks and, in so doing, has moved beyond trained typists to encompass anyone who uses these technologies.

Thus, while path dependence takes irreversibility for granted, with each event within the chain a reaction to temporally antecedent events, and thus dependent on prior events, the ANT view of irreversibility allows for its treatment as a relational matter. In so doing, rather than take irreversibility for granted as a blackboxed self-reinforcing mechanism, irreversibility can be seen as the contingent outcome of mobilizing and engaging actants in an actor-network, a blackbox that can be opened up and reworked. It is this conceptualization of irreversibility that is of interest.

CONCLUSION

Through the contributions of Latour's (1993) modern thesis and actor-network theory, I have sought to demonstrate the possibilities to look beyond the limitations of path dependence theory, while still addressing the concerns in the literature with regard to process, history and new ways of theorizing and studying organizational form(ing). Of particular interest to this discussion is the re-articulation of path dependence as a constructivist endeavor (Latour, 2002), incorporating the concept into actor-network theory through its reconsideration by Callon as 'irreversibility' (1991; 1993; 1994; 2005).

In addition to offering the possibility to add theoretical depth to path dependence, ANT also addresses the critiques of path dependence regarding structural determinism (e.g., Garud & Karnøe, 2001; Greener, 2002; Stack & Gartland, 2003, 2005) and privileging of stability over change (e.g., Boas, 2007; Greener, 2002). ANT's flexibility in seeing path dependence, conceptualized as irreversibility, as a materially heterogeneous performance allows for following the process through which, for example, organizational form becomes locked-in, while at the same time maintaining an opening for 'forming.' As viewed through an ANT lens, the

structure/agency dualism dissolves in favor of actors performing relationally. Equally, although irreversibility points to stability, such a state remains contingent and is at all times dependent on the multiplicity of actors hidden from view through blackboxing holding together and continuing to perform relationally. Thus, while path dependence can provide us with a persuasive account of how history comes to be rooted within organizational form(ing), ANT provides us with a richer insight into the process through which materially heterogeneous actor-networks come to be simplified to the point where irreversibility becomes significant.

Through ANT, therefore, writing process and history means adopting a material semiotics and a reflexive stance. As Callon (1991: 154) notes, an “actor has a variable geometry and is indissociable from the networks that define it and that it, along with others, helps define. So it is that history becomes a necessary part of the analysis.” And it is in following the actor-networks as they co-evolve and irreversibilize that we may more clearly see the “complexity of historical becoming” (Touraine, 1988: 11).

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