

Pragmatism, Practice, and the Boundaries of Organization

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This article uses a longitudinal qualitative analysis of key transitions in the relationship between Fiat Group Automobiles and a major supplier to integrate a pragmatist model of action into the contemporary “practice” approach to the study of organizations. It builds on an affinity between pragmatist and practice approaches that has been widely recognized but has not yet been fully developed with reference to an empirical case. It argues that an analytic reliance on a pragmatist conception of agency improves on the more general reliance in studies of organizational practice on a conception of the agent imported from Giddens’ structuration theory [Giddens A (1984) *The Constitution of Society: Outline of the Theory of Structuration* (Polity Press, Cambridge, UK)]. The argument is developed with reference to a long-standing debate in organization theory—the debate over the determinants of organizational boundaries—that has grown in importance as companies have responded to market and technological volatility by involving suppliers not just in the production but also in the conceptualization and design of the products they sell. It provides a theoretical framework that can help analyze the place of managerial agency in organizational strategy making and explain why organizational boundaries in many industries today are so unsettled and contested and are likely to remain so in the future.

Keywords: pragmatism; practice; routines; economic sociology; field study; qualitative research; interorganizational relationships; organizational boundaries

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1. Introduction

In this article, we use a longitudinal study of the boundary between Fiat Group Automobiles (henceforth Fiat) and a particular automotive supplier (pseudonymously dubbed TIER1) to integrate an explicitly “Deweyan” pragmatist model of action into a “practice” approach to the study of organization. We are thus primarily in dialogue with the rich and growing vein of contemporary study described by Feldman and Orlikowski in their 2011 essay on the theorization of practice and the practice of theory. This means, specifically, that we are focused empirically “on the everyday activity of organizing in both its routine and improvised forms” (Feldman and Orlikowski 2011, p. 1240) and theoretically on the explanation of “the dynamics of everyday activity, how these are generated, and how they operate within different contexts and over time” (p. 1241). We depict organizational strategy as “a situated, socially accomplished activity” that emerges from the “actions, interactions and negotiations of multiple actors and the situated practices they draw upon” (Jarzabkowski et al. 2007, pp. 7–8). And, like others in that vein, we are therefore wary of common reliance in organization studies on Williamson’s (1998, p. 77) “logic of discriminating alignment” (or such similar assumptions) to generate a seemingly objective “language of states and positions to conceptualize the ‘fit’ between the

resource base of an organization and its strategic location within a competitive environment” (Chia and MacKay 2007, p. 220).

The analysis builds on a series of very specific contributions made in this vein of study in recent years, including especially (i) the demonstration that analytic recourse to depictions of technology as “an external, largely independent, and irrevocable force for change” obscures “the potential for humans to adapt technology (whether as developers or users) in multiple and contingent ways” (Feldman and Orlikowski 2011, p. 1246; see also Orlikowski 1992, 1996, 2000, 2002); (ii) evidence that the “strategy tools” that support managerial decision making can be usefully construed as “boundary objects” that “enable and constrain knowledge sharing across boundaries” but that may also “be used differently in different contexts” (Spee and Jarzabkowski 2009, pp. 226 and 228; see also Jarzabkowski 2005; Jarzabkowski and Wilson 2006; Jarzabkowski and Kaplan 2008); and (iii) the distinction that Feldman and Pentland (2003, pp. 101–102) draw between the “ostensive” and “performative” aspects of routines, where the former denotes “our perception of what the routine is” and the latter references instead “the specific actions taken by specific people at specific times when they are engaged in an organizational routine.” At the same time, however, we

do not read this vein of study uncritically. We contend, in particular, that the practice approach to the study of organization as generally constituted today is limited by its reliance—whether implicit or explicit—on a theory of human agency imported wholesale from Giddens' (1984) writings on “structuration.”

The claim that a broad swath of the contemporary practice literature has drawn heavily on Giddens' writings is uncontroversial (see, e.g., Jarzabkowski 2008, Jones and Karsten 2008, Jarzabkowski and Spee 2009, Whittington 2010, Feldman and Orlikowski 2011). The claim that such reliance in turn limits the explanatory range of the practice approach as generally constituted today is, however, less a matter of common agreement. To defend it, we draw in part on William H. Sewell's influential 1992 documentation of the absence in Giddens' writings of any clear link between a conception of actors as reflexive, purposive, and knowledgeable and some cognate “vocabulary for specifying the *content* of what people know” (Sewell 1992, p. 7, italics in original). But where Sewell sought that vocabulary in cultural anthropology, we think Orlikowski's studies of technology, Jarzabkowski's work on strategy tools, Feldman and Pentland's analyses of routines, and similar such conceptual development in the study of practice provide organizational studies with the necessary vocabulary. What we think is still missing, or at least underdeveloped in studies of organization, is a cognate theoretical link between that vocabulary, a conception of the human agents as reflexive, purposive, and knowledgeable, and what Joas (1987, p. 22) refers to (in his own critique of Giddens' theory of structuration) as “the specific situation[s] of human organisms in their environment.”

To show that this underdevelopment in fact has consequences for organizational analysis, we initially present our case material through a relatively conventional practice lens while, at the same time, self-consciously avoiding any explicit theoretical discussion of agents or agency. That initial narrative, presented in §2, recounts three transitions in patterns of governance at the boundary between Fiat and TIER1. It shows that technology was not an external and irrevocable force for change and that strategy tools indeed shaped knowledge sharing across boundaries in a variety of ways, and it documents the analytic utility of Feldman and Pentland's (2003) distinction between ostensive and performative elements of routines. This “conventional” narrative serves then as the grist for §3, where we identify the limits to existing practice approaches, with particular reference to (i) those who argue that to focus on agents at all is a mistake and instead accord “ontological priority . . . to an *immanent logic of practice* rather than to actors and agents” (Chia and MacKay 2007, p. 219, italics in original) and (ii) those who rely—whether implicitly or explicitly—on structuration theory for their conception of agency. We argue, specifically, that the former provides too little

insight into the empirical volatility of practice at the organizational boundary in question and the latter helpfully frees the organizational straitjacket of prevalent but overly deterministic theories without, however, providing us with sufficient guidance as to the whens and the whys of that same empirical volatility.

This frames the theoretical and explanatory challenge that, we argue, is well met with an eye toward pragmatism. This places us also within a line of thinking that has a long history in organization studies, dating back to Selznick's (1957, 1996) rejection of the dualisms of the impersonal as well as between the formal and the informal. It has, though, garnered new favor across the social sciences over the last few years (see, e.g., Joas 1993, 1996; Emirbayer 1997; Whitford 2002; Kilpinen 2003; Gross 2009; Ansell 2011). This is, moreover, especially true in organization studies such as Cohen's (2007, p. 779), who has shown how Dewey's understanding of the role of “habits” in daily practice helps distinguish the “recurring action patterns” (i.e., routines and practices) that interest scholars of organization from the many seemingly similar behaviors that are, however, “rigid, mundane, mindless or explicitly codified.” Adler and Obstfeld (2007) use “Dewey's account of human conduct” (p. 39) to unpack “the orchestrated stream of more or less creative projects that yield new products and processes” (p. 35); Simpson (2009, p. 1330) depicts pragmatism as a “way of drawing together the habitual and creative aspects of practice, while at the same time transcending the problematic separation between individual and social levels of analysis” (see also Elkjaer and Simpson 2011). We do not, however, know of any studies to date that explore these affinities between pragmatism and the practice approach in organization studies with detailed reference to an empirical case in the examination of concrete questions of organizational behavior and strategy.

So in §3, we also reanalyze our case to identify similarities between the recurring action patterns that organizational scholars refer to as “routines,” and the habits that Dewey defined as actors' “acquired predisposition to *ways* or modes of response” in the face of situational cues (Dewey 1922, p. 42, italics in original). We show that actors' “lines of action” break down when “invasions from without and inventions and innovations from within radically alter the course of life” (Dewey and Tufts 1936 [1932], p. 198) and that the resulting “problem situations” force them to “turn things over intellectually” (Dewey 1938, p. 102) as they “investigate what it would be better to have happen in the future” (Dewey 1939, p. 66). As we analyze those investigations, we eschew individualist theories of agency that—Dewey complained—depict “human activity as a sequence of separate instantaneous ‘actions’” (Kilpinen 2003, p. 292), and we maintain that such theories err in their reliance on “spectator theories of knowledge” that “[deprive] reason in man of an active and creative office” (Dewey 1929, p. 211). We thus do not ask

whether optimization, satisficing, norms, a logic of appropriateness, or some other such rule might usefully provide a rule of first resort (as is commonly done), but instead we depict organizational actors as reflexively—rather than calculatedly—rational. We link a specifically pragmatist conceptualization of reflexivity to the existing vocabulary of organizational practice. And, most importantly, we show that we can, as a consequence, better understand how, when, and why actors invoke particular technologies, tools, relations, and routines to coordinate their activities within and across organizational boundaries.

2. Transitions

Our case material is drawn from a larger ongoing project (and subprojects) tracing the evolution of the production network that revolved about Fiat. Since 1998, we have conducted 58 semistructured interviews with 50 different persons employed by Fiat, and 78 interviews at 42 different first- and second-tier suppliers. The interviews were conducted in four waves: 21 were conducted between 1998 and 1999, 20 between 2001 and 2003, 48 between 2006 and 2008, and 47 between 2010 and 2012. Interviewees have been selected primarily according to their links to the product development process or to the management of relationships that cut across organizational boundaries. At Fiat, we have spoken both with senior managers (e.g., the chief technology officer, the vice president of purchasing) and with more operational personnel (e.g., managers in charge of vehicle lines). At suppliers, we have sought out those responsible for the commercial relationship with customers and those in charge of component or system development. At both, we have collected documentation—now totaling more than 2,000 pages—including presentations of broad company strategies, descriptions of engineering solutions, norms and procedures in product development and supplier relations, contracts with external sources of innovation, outlines of supplier classifications, and the like.

We therefore have data on many relationships. In this article, though, we sacrifice breadth for depth by focusing on changes over time in the coordination of activities across just a single organizational boundary—that between Fiat and TIER1. We do so for three main reasons. First, the focus on TIER1 gives us a complex boundary to examine. TIER1 is large—operating in more than 20 countries and employing approximately 65,000 people worldwide—and makes a wide array of components not just for Fiat but for other assemblers as well. Second, we have particularly good longitudinal data on both sides of the boundary in question. Besides extensive interviews at Fiat with relevant personnel in both purchasing and engineering divisions, we have conducted 20.5 hours of interviews across eight different individuals employed at TIER1, and we have spoken to them at different times: we spoke with the plant director in 1999 and with three

managers in purchasing and quality at a satellite plant in 2002; we conducted long interviews with the division's Fiat account director and with a program manager on two separate occasions in 2006 and spoke at length with both again in 2011. Third, and most importantly, the boundary in question is interestingly tumultuous and—we shall argue—is “very special in the sense of allowing one to gain certain insights that [an analysis of] other organizations would not be able to provide” quite as well (Siggelkow 2007, p. 20; see also Eisenhardt and Graebner 2007).

2.1. Modularizing

Our case narrative begins in the late 1990s at a time when the leadership of both Fiat and TIER1 were in thrall of a set of strategies associated with the possibilities thought to inhere in what is commonly referred to in both the academic and business press as a “modular” product architecture. By this, we mean that they had taken heed of ideas circulating in the industry at the time that had located the successes of decentralized organizational structures—many first identified in studies of Japanese manufacturing—in the standardization of interfaces between component parts (i.e., in the artifacts potentially exchanged). Such standardization, they thought, would allow them to more easily repurpose and recombine artifacts (be they physical or conceptual) and therefore also engineer them in relative isolation from each other (see, e.g., Langlois 2002, Sturgeon 2002, Garud et al. 2003). They expected, consistent with those ideas, (i) that modularity would generate “strategic benefits such as cost and lead time reductions and the ability to customize product lines in mass quantities” (Ro et al. 2007, p. 173), (ii) that this would in turn allow them to correspondingly reduce the asset specificity of their joint investments, and (iii) that their shared boundary could therefore be a more “loosely coupled” organizational structure, since the overt specification of the interface, and of the performance standards, could be governed substantially by enforceable contract, thus dramatically reducing the need for an “overt exercise of managerial authority across the interfaces of organizational units developing components” (Sanchez and Mahoney 1996, p. 73).

We were told by Fiat's director of new product development, for instance, that Fiat's “main concern” in the mid-1990s had been “to reduce assets and overall development costs and, at the same time, to leverage external sources of innovation” in a strategy that “was supposed to reduce the capital invested, to give [them] more flexibility” and, at the same time, still give them “access to state-of-the-art technology.” That “concern,” to quote another high-level manager, had led the company's leadership to a strategy that would—if all went well—“use modules as a tool to go from a situation in which [Fiat] had to coordinate 5,000 components to a situation in which [Fiat] could leave everything to five system suppliers once

[Fiat] had designed the interfaces.” The automaker, he explained, had taken “the idea of modularity” and “interpreted [it] in the sense that the system integrator should have the competence of integrating systems as its core competence.” This, he continued, had led the company’s technical divisions to shift patterns of investment under the assumption that they “could be substantially detached from certain component and systems technologies and [could] focus primarily on ‘architectural’ know-how. For this reason [Fiat] delegated to suppliers the complete development of certain technologies, those that we did not consider as core.”

The technologies we focus on here are those that make up the “occupant safety system,” which is made up primarily of the air bags, seat belts, sensors, and the other components that protect passengers in a crash. It is a system that cannot (given current technology) be made *physically* modular like the electronic components that have been featured in the development of the concept (e.g., hard drives or motherboards that plug into a desktop personal computer) since its main components—the airbags and seat belts that protect the passenger in a crash—necessarily interact with each other, with a wide range of other components and systems, and must be connected to sensors placed at different places in the vehicle. It is also a system that, as Chan (2002, p. 220) observes, is complex: the “implementation of air bags and related occupant restraints requires extensive knowledge from various engineering disciplines” and presents “challenging tasks in both analytical and experimental phases of product developments.” But it was, nonetheless, identified by Fiat’s leadership and technical departments as a candidate for modularization because (i) it was subject to a rate of technological advance in the underlying components that would require real investments that Fiat was hoping to forgo, and (ii) the definition of overall system performance—occupant safety—could be defined relatively clearly and could verifiably be measured, thus allowing the parties to stipulate clear terms of contractual performance.

The effects of this decision on the governance of transactions at Fiat’s shared boundary with TIER1 were profound. The latter is a global company that had entered the Italian market in the late 1980s by acquiring existing Italian suppliers and that had by the 1990s a very substantial presence in Fiat’s supply base as a supplier of safety components. The company had, moreover, been investing heavily at the same time in research and development (R&D) and technologies in the hopes of taking advantage of broader changes in the industry. So, as a TIER1 interviewee told us at the time, Fiat’s decision to forgo investments in safety technologies was thus happily received at the supplier. It was framed as an opportunity “to learn about the process of system integration” and, going forward, to better amortize those investments by supplying a greater proportion of the value

in Fiat’s vehicles.¹ At the same time, though, he and other interviewees made clear that they were, with Fiat, making a decision to substantially alter the routines—both organizational and interorganizational—that each company used to coordinate the development of the contracted system. And they were aware that this would in turn reconfigure the division of what Winter (2003, p. 991) refers to as “capabilities”; that is, they anticipated changes over time in those collections of routines “that, together with implementing input flows, confer upon an organization’s management a set of decision options for producing significant outputs of a certain type.”

Less abstractly, the move was a break away from a division of labor in which TIER1’s R&D headquarters in northern Europe would develop technologies, sometimes on their own initiative and sometimes in response to problems posed by clients (including but not limited to Fiat), for eventual customization in particular applications (generally, but not exclusively, in vehicles). That customization would involve a regular back-and-forth of mutual adjustment that would take place in meetings between Fiat engineers and “application engineers” located at TIER1’s Italian division, with the lead firm (i.e., Fiat) engineers tasked with primary responsibility for the overall performance of the various systems that make up the car. That collection of routines had therefore required Fiat’s in-house engineers to maintain the know-how to make decisions about performance trade-offs when there were interactions between components supplied by TIER1 and the rest of the vehicle—including, of course, interactions with components designed by other suppliers. But, with the turn toward modularity, it was jointly agreed that TIER1 would instead provide Fiat with a “black box”—a term that is industry shorthand for systems or components the internal workings of which the buyer need not understand, because they can, for practical purposes, be represented entirely in terms of their input, output, transfer, and performance characteristics.

The implementation of this plan was intended, as per the managerial literature on modularity, to ease the division of “complex tasks into simpler portions to allow the tasks to be managed independently and yet work together as a whole without compromising performance” (Mikkola 2006, p. 128; see also Clark and Fujimoto 1991). TIER1’s application and sales engineers in Italy would still be expected to manage relationships with their counterparts at Fiat’s technical center. However, they would also be tasked with responsibility for the key decisions about performance trade-offs and would be expected as they made those decisions to rely on their own technical center for know-how and competencies. The supplier, in exchange, would receive higher margins on the various components they supplied than they had previously.² Or at least they would so long as the system obtained a five-star rating [the maximum] on the European New Car Assessment Program (Euro NCAP) crash test. This

test would—again in keeping with management theory on modularity—serve to adjudicate whether the black box in fact worked.³ The Euro NCAP was deemed the appropriate test both because it has substantive marketing value and because it would provide the companies with a (presumably) nonnegotiable measure of the success or failure of the occupant safety system and therefore of the performance of the party responsible for its design.

2.2. Learning by Monitoring

The degree to which modular product designs have spread is the subject of considerable debate in studies of the auto industry, where many have questioned how feasible it is to standardize components and interfaces in the design and making of something as complex as a car (Zirpoli and Camuffo 2009, MacDuffie 2013).⁴ And so it is perhaps not surprising that the implementation of this new division of labor between Fiat and TIER1 ran into numerous snags. What is perhaps more surprising—at least according to the thinking of Sanchez and Mahoney (1996), Sturgeon (2002), and the many others who have written so prominently about the virtues of modularity as a means to manage uncertain markets—is that there were no obvious breakdowns at the companies' shared boundary despite ample evidence of breakdowns in routines established by the two companies. Those breakdowns, though, were largely in the ostensive aspects of those routines. And enabled first by the improvisation that Feldman and Pentland (2003) locate in the performative aspect of routines and then by recourse to an additional strategy tool that—as a boundary object—served to “enable and constrain knowledge sharing across boundaries” (Spee and Jarzabkowski 2009, p. 226), the two companies managed to rewrite those routines on the fly in ways that allowed TIER1 to maintain responsibility for the overall performance of safety systems designed into vehicles produced by Fiat.

The first snags came quickly. The idea of modularity as it was interpreted at Fiat was supposed to generate just one of two possible outcomes at particular boundaries. Either Fiat's technical centers would minimize complex interactions across key interfaces, thus dramatically reducing the need for Fiat personnel to coordinate activities with suppliers, or they would fail to produce such an architecture. If testing were to reveal that the input, output, transfer, and performance characteristics specified were not adequate to the task, the company would—in theory—reverse its decision in light of results. But in fact, we were told, the presumption that a clear performance measure—five stars on the Euro NCAP test—would ease the adjudication of trade-offs proved too optimistic, since its translation into subobjectives required the complex coordination of multiple parties. A TIER1 engineer explained, “If the seat doesn't work right in the crash test, you don't get five stars. If the supplier of the coverings for the door or the dash—which is a very

important interface—doesn't develop his component right, the airbag won't come out when it should.” He went on to say that such contingencies created problems not just with TIER1 but also with other players who had interests that ran beyond just the performance of the safety system. And he gave the example of door coverings that, if changed, would have to be cleared not just with a specific supplier selected by Fiat and with a second-tier supplier of materials but also with Fiat's marketing department, since they affect the “look and feel” of the vehicle.

He made clear, in short, that the idea of modularity had generated problems that were qualitatively different from those he and his colleagues had faced previously, when design and engineering responsibilities could be established during the preoffer phase on the basis of what our interviewees at both Fiat and TIER1 described as “gentlemen's agreements.” The complexities of full system supply required them to coordinate with many more players, which they had expected. But they had also expected that their coordination with those players could occur without in the straightforward manner characteristic of the “loosely coupled” organizational structure to which they had ostensibly turned. In fact, they told us they often found themselves with too little formal recourse when things went awry. “When things don't work,” one TIER1 engineer said, “it is very hard to know who is at fault; it is very rare that you know this at the end of the project.” He and others we interviewed would then explain—though obviously not with the jargon of the organizational theorist—that the performative aspects of their routinized coordination across organizational boundaries necessarily still relied on the gentlemen's agreements they had worked out over the years, with the parties improvising as necessary in small workarounds, informal communications and the like to ensure that projects moved along.

It was also in conversations on these same topics, though, that we were first told about a particular management tool—the “RASI”—that two companies decided to write and to use to help them respond more effectively to the complex demands of coordinating activities with such a large number of personnel located across so many different departments and organizations. It consisted of a matrix. Its rows listed activities identified as necessary to the successful completion of a particular component or system development project (the “whats”). Its columns carried the “whos” in the form of Fiat departments, suppliers, or divisions within suppliers who might be involved or potentially involved into the project. The cells then contained the letters of the acronym, with each defining the role of the particular “who” for the “what” on the line in question. “R” meant that the “who” in that column is *responsible* for some outcome and therefore has final decision power regarding decisions about trade-offs; “A” gave some power as well, as it meant the listed party has to *approve* or sign off on those decisions but is

not expected to maintain the same level of oversight or know-how; “S” meant the party is to offer *support*, meaning that the responsible party can make demands on their resources; and those with an “I” must be *informed* on decisions made, lest those decisions interact with outcomes for which they are responsible.

The development of the RASI was not, to be clear, out of the ordinary for the industry. Such matrices, which come in many varieties, are commonly used in project-based work and are representative moreover not just of the broad class of strategy tools that Spee and Jarzabkowski (2009) have shown to shape, enable, and constrain knowledge sharing across boundaries. They—and their effects on coordination—have been explored especially in the context of the auto industry by Charles Sabel and a series of collaborators. That exploration has taken place across a series of studies that—building on the findings of Fujimoto (1999, 2001), Nishiguchi (1994), and others associated with the International Motor Vehicle Project—have begun to fashion an explanation for the emergence of what Powell (2001, p. 54) has referred to as a “new logic of organizing” (Sabel 1993, 1994, 2006; Helper et al. 2000, Gilson et al. 2009). The argument holds, specifically, that tools such as the RASI have spread for two reasons: (i) the relentless demands for innovation that characterize competitive and fast-paced markets (e.g., automotive) have made the standardization of interfaces required for modularity too risky since it “leaves open too many possibilities for competitive improvements that would cumulatively undermine the initial interface” (Gilson et al. 2009, pp. 446–447), but (ii) a reliance instead on informal coordination and “goodwill trust” available across “embedded ties” brings risks too, as such reliance may lock a company into relationships with collaborators who are not, however, at the technology frontier (*ibid.*).

The key tools and technique that Sabel and collaborators identify consist of “contracts for innovation” such as the RASI as well as associated routines for systematic “benchmarking, simultaneous engineering, error detection and correction,” and the like. Such tools and techniques, they claim, amount to routines that force parties to “question the suitability of their current routines” (Gilson et al. 2009, pp. 447–448). Gathered together under the broad rubric of learning by monitoring, those tools and techniques do not depend on the fragile social overlay of goodwill trust. Instead, their operation generates a sort of “studied” trust by obligating parties to monitor each other in ways that are less about ferreting out opportunism than they are about the joint definition of “provisional, initial designs” that can be revised “in the light of further review and operating experience” (Sabel 1993, 2006, p. 108; Helper et al. 2000). They are especially functional, therefore, wherever market or technological uncertainties make it too risky to “assume that one’s current processes, no matter how much they improve on past practice,

are competitive, let alone superior” (Helper et al. 2000, p. 467) to those of competitors, since the challenge in such circumstances is often less to protect private information (for fear of holdup) than it is to identify just which bits of information and knowledge are useful, and to what purposes they might be used (Sabel 1993). And so, it continues, we thus see companies turning away from a reliance either on the informal or on standardization and turning toward tools, such as the RASI, that help them to collaboratively “detect performance failures and deception before they lead to disastrous consequences” (Helper et al. 2000, p. 466).

These arguments suggest that we ought less to ask why TIER1 and Fiat engaged in the writing and implementation of a RASI, and we should focus instead on the ways in which that writing and subsequent joint use RASI affected coordination at their shared boundary. There, our data show that it did force changes—as Sabel and collaborators predict—not just to routines implemented specifically to support the idea of modularity but also to legacy interorganizational routines established across many years of codesign. It suggests, moreover, that those effects came precisely because the RASI begat and required routines to force engineers across an array of companies to question the suitability of their current routines (Gilson et al. 2009, p. 447). They were, in short, engaged in a structured and explicit negotiation, as well as exploration, of the complex multifirm division of labor they had bought into when they agreed to implement black box sourcing in the safety system supply. An interviewee explained the process:

If the passenger side airbag has a cover that is not integrated in the dash, we are responsible for the cover. If instead, like is often the case today, the dash itself has an integrated opening, the responsibility for the opening of that hole in a crash is the dash supplier. The responsibility in that case passes from the maker of the airbag component module to the maker of the dash module. The normal *modus operandi* [after the writing of the RASI] is to make these sorts of changes in conjunction with Fiat.

The design of the RASI was, we were told, an arduous process that took more than six months of joint work. TIER1 employees took the lead often but not always, since they had the component-specific information with one explaining, for instance, that he and his team might say to Fiat, “Look, in our opinion, it’s not right that we be responsible here, because the dashboard supplier is involved and there we ought instead to give approval,” even as they recognized that this would in turn require negotiations with the dash supplier and likely some second-tier suppliers as well. It forced, in short, a “cooperative exploration of ambiguity” (Helper et al. 2000, p. 445) in which both sides recognized—in the words of a TIER1 interviewee—that the “big problem at the time” was that neither Fiat nor TIER1 really understood “how to manage the development of a system that had been completely

outsourced.” The result, though it had been expensive in terms of the engineering hours spent, was an effective and novel mapping of the remaining interactions in the system built (i) in response to glitching in their joint turn toward modular system supply and (ii) amid a recognition—to quote a TIER1 interviewee—that there had been a “shared need to decide what the key technical moments were because either Fiat or TIER1 had to be responsible for each activity.”

2.3. Embedding

Responsibility for the overall performance of the safety system remained with TIER1 engineers until 2005. In that year, however, things somehow changed consequent to a crash test conducted for the purposes of observing system performance. Such tests, though held relatively rarely because they are expensive and time consuming, were (and are) a standard part of the design process and are regularly accompanied by a debriefing afterward. The particular test was successful (and was not the first such test to go well in the years TIER1 held responsibility). Yet in the particular debriefing, TIER1 engineers nonetheless revealed that they did not know quite why the system had worked and told us that they had complained that they “did not control the design of all the subsystems involved” and that they were not “responsible or even competent for the design of the chassis, the engine layout, and packaging of components and systems that affect the performance of the occupant safety system.” This had convinced Fiat engineers that it would be a mistake to “leave to serendipity the fate of the next occupant safety system.” And once Fiat and TIER1 brass were apprised, and after some further negotiation, the two companies finally and fundamentally revisited the base RASI. Overall responsibility for the performance of the safety system was returned to the automaker—necessitating some attendant costs and new investments in know-how in Turin—while TIER1 engineers stepped back into their previous role and were therefore again responsible for the performance of parts and components, rather than for the system as a whole.

It is curious from many points of view that such a shift occurred in the wake of a *successful* test—since an ostensible feature of a modular product architecture is precisely that the purchasing firm need not entirely understand why something works so long as it can for practical purposes be represented in terms of its input, output, transfer, and performance characteristics (Clark and Fujimoto 1991). The joint decision to return responsibility for overall system performance to Fiat was certainly rejection of the ostensive routines associated with the idea of modularity, given that black boxing the system was rejected notwithstanding its apparent and measurable effectiveness. The theory of learning by monitoring and associated routines presented by Sabel and collaborators fares better. It is telling that the RASI

per se was not scrapped. Indeed, the renegotiation of the boundary between Fiat and TIER1 was coordinated through a rewriting of the RASI. Fiat, moreover, continued to use the broader mapping of interdependencies developed with TIER1 to govern the design of safety systems across a multitude of firms (they used it, we should add, not just in the development of safety systems with TIER1; the underlying interdependencies identified in the matrix shaped their relationships with other suppliers as well). It is notable also that the existence of a “debriefing” for purposes of benchmarking after a milestone event such as a crash test is, like the RASI, part and parcel of the techniques of learning by monitoring. And yet the fact that “responsibility” for the overall performance of the passive safety system was not returned to Fiat until after a successful test still bears explanation.

The puzzle, put simply, is that TIER1 engineers’ willingness to expose their ignorance to their client exposed them to considerable risk. Fiat engineers might well have drawn the implication that they were simply not as competent as they maintained. They had, after all, committed themselves as a matter of strategy to the development of the competencies necessary to engage in full system supply, and they had been compensated accordingly. Their willingness to tell Fiat engineers that the companies’ joint strategy was problematic could have been seen as revelatory of their—rather than the architecture’s—performance failure. And given that this was not the first such successful test, it cannot be sufficient simply to ascribe the change to the ways in which the routines of learning by monitoring engender information sharing and thus uncover “performance failures and deception before they lead to disastrous consequences” (Helper et al. 2000, p. 466). It would seem, rather, that we must be aware that even routines for “questioning the suitability of current routines” (Helper et al. 2000, p. 468) have both ostensive and performative aspects; engineers at both companies seem, after all, to have been quite attendant “to the actions taken by relevant others and the details of the situation” (Feldman and Pentland 2003, p. 102) without, however, ever questioning their joint commitment at the operational level to sharing “provisional, initial designs” that they would then revise “in light of further review and operating experience” (Sabel 2006, p. 108).

The RASI, they told us, had intersected with routines at multiple levels in the organization, creating a sort of double edge. It had given just enough formalization to roles and responsibilities to make Fiat’s black boxing of the safety system barely workable. But the negotiation of those roles and responsibilities at a particular point in time had also fixed them in ways that not only reflected but also reinforced assumptions about the functioning of that strategy. We were told by a TIER1 manager, for example, that “the projects that followed were essentially based on refinements more or less agreed upon but always ‘imprinted’ by that first RASI.” This was because the

number of components and suppliers was so large that it would have been unworkable to define a new RASI for each new project. Instead, the manager explained that “what usually happens is that there is a RASI defined as the ‘mother’ for all major systems, and this is then refined along with Fiat to meet the needs of a particular project.” The “mother” RASI in question here, he explained, was heavily influenced on the one side by strategic decisions made on high by executives at Fiat deeply committed to the development of a modular product architecture, and on the other side by TIER1 leadership in northern Europe similarly committed to developing the capacity to provide even more complete safety systems not just to Fiat but other assemblers as well. It was, in short, a mother RASI explicitly designed—albeit for contingent reasons—to ensconce a modular logic into the distribution of organizational roles across the production network.

That the RASI, as a boundary object, might enable and constrain knowledge sharing across boundaries (Spee and Jarzabkowski 2009, p. 226) is, of course, no surprise. It was supposed to. Our point is that the details matter, and that there was still considerable improvisation in ways that can, however, be understood. We can observe, for instance, that the eventual challenge to the self-limiting elements of the roles and responsibilities inscribed (at least ostensibly) in the routines associated with the RASI became possible only because the TIER1 and Fiat engineers who were actually responsible for the design of the system were in fact “multiply embedded” (Meyer et al. 2011). By this, we mean that those engineers were not located *just* in their respective corporate hierarchies with the resultant internal career ladders as well as formal and informal networks. Much of the work on the safety system was necessarily done by the TIER1 personnel located in Italy who were tasked with the “application” engineering of projects for Fiat. Those managers and engineers therefore had their careers tied into the fortunes of Fiat, since the failures of that client company could lead to poor sales of models that would, in turn, affect the viability of TIER1’s Italian investments. Importantly, they had long-standing relationships with Fiat engineers at multiple levels and had especially strong relationships with the numerous players at Fiat involved in what is called the “platform team.” And they knew as a result that many of those Fiat employees on the platform team—generally midlevel engineers—had grown unhappy with the broad strategic shift from component to system supply.

That shift, as it turned out, had generated problems for Fiat elsewhere in the network. TIER1 engineers were frustrated because they had to manage relations with third-party suppliers over which they had little contractual power, had no substantial history across which to have developed trust, and in many cases had no technical superiority. Moreover, they knew that some Fiat engineers were little enamored of their own plight in a company they believed had committed too much to the pursuit of a

modular product architecture. One engineer at Fiat told us in 2006, for instance, that the experience of Fiat’s turn to modularity had taught him that “you cannot integrate component performances you know very little about... if you have never designed a component or a system it will be very difficult to understand the subtle interactions with the rest of the vehicle.” Most parties on both sides recognized that the RASI had been an enormously helpful management tool, since it usefully structured when, where, and how TIER1 staff were to turn to Fiat for help managing relations with problematic third parties. But it had not obviated the need for situational recourse to informal “embedded” ties and a reliance on goodwill trust in the pursuit of workarounds. And that proved fortunate because the existence of that goodwill trust meant that TIER1 engineers could make their decision to reveal that they did not quite know why the crash test had worked, confident that they were in the presence of parties with whom they had long-standing working relationships and who would therefore believe their revealed ignorance to reflect systemic rather than individual deficits.

3. Practical Agencies

The previous section aimed simultaneously to lay out our case material and to convince the reader that a relatively conventional “practice lens” can illuminate patterns of transactional governance at the boundary between Fiat and TIER1. We argued, in particular, that a reconstruction of interfaces in the safety system had less influence on organizational structure than is predicted in much writing on modularity, underscoring instead “the potential for humans to adapt [such] technology... in multiple and contingent ways” (Feldman and Orlikowski 2011, p. 1246). We depicted the tools and techniques of learning by monitoring as boundary objects that enable and constrain knowledge sharing across boundaries but emphasized also that they may be used differently in different contexts (Spee and Jarzabkowski 2009, pp. 226 and 228) to a greater degree than Sabel and collaborators have recognized in their own writings on the question. And we drew heavily in the analysis on the distinction that Feldman and Pentland (2003, p. 94) draw between the ostensive and performative aspects of organizational routines to explain how particular organizational routines could serve sometimes as sources of “inertia and inflexibility” while at others times “be an important source of flexibility and change.” We have, in short, sought so far at least to confirm that “practice theory, with its focus on dynamics, relations, and enactment” is—as its proponents claim—potentially well suited to analyses of the “complex, dynamic, [and] distributed” forms of organizing characteristic of the automotive industry today (Feldman and Orlikowski 2003, p. 1240).

3.1. Whether Agency?

We have not, as promised, made explicit reference in the case narrative thus far to agency or to theories of the agent. We left such matters implicit so that we can, in this section, more clearly identify our particular contribution relative to current and prior art (i.e., to help us to clarify the proverbial “difference that makes the difference”). And so we must respond first to those who argue it better simply to accord “ontological priority . . . to an *immanent logic of practice* rather than to actors and agents” (Chia and MacKay 2007, p. 219; italics in original). Or to put things another way, if it is so easy to leave such matters implicit, what is gained by making them explicit? Our answer draws on claims common both to pragmatists and to those who follow Giddens, in that we find the granting of ontological priority one way or the other to be a mistake. To do so simply misconstrues the projects of those who today write in those traditions on structure and agency and who do not, by any means, think the problem “intractable” (as suggested by Chia and MacKay 2007, p. 217). But our empirical findings inform that answer too. Although Chia and MacKay (2007, p. 238) do recognize that “deliberate purposefulness strategizing may occur” when “breakdown occurs,” they also declare such instances to be “more the exception than the rule.” The evidence, to our read, runs to the contrary. Breakdowns—perhaps small scale, but breakdowns nonetheless—are endemic but are routinely repaired through the improvisation of agents in the performative aspects of their routines.

More to the point, we see no way to explain the three transitions we have identified without some reference to the empirical significance of structured-but-contingent decisions made by specific human agents who certainly seem, for their own part, to have made those decisions in ways consistent with a theorization of their agency as reflexive, purposive, and knowledgeable. One might, for instance, depict the two companies’ initial turn toward modularity in broad field-level or institutional terms that make reference to the power of shareholders and coercive isomorphism or perhaps to trends in the industry and mimetic isomorphism (e.g., Fligstein 1996, Garcia-Pont and Nohria 2002, Lieberman and Asaba 2006, Delmas and Toffel 2008). But that does not take us very far when it comes time to explain how and why the engineers most directly tasked with designing the systems in question turned then to the RASI and the techniques of learning by monitoring not so much to undo modularity but—they initially hoped—to save it in some form or another. It is problematic even to interpret their continued attachment to full system supply as exemplary of the “myth and ceremony” necessary to maintain continued symbolic legitimacy, given that TIER1 engineers were still quite committed at the time to squeezing whatever learning about system integration they could from the companies’ revised division of labor. And we think it all but impossible to fairly depict changes in the ostensive routines directed

toward the achievement of that purpose as somehow “immanent” in the logic of practice at the time.

Recourse to the RASI, after all, was not the only response available when the difficulty of developing a modular product architecture became apparent, nor was it even the only response taken by suppliers across Fiat’s own production network. A different supplier to Fiat told us, for example, that they too had taken a “little step in that [modular] direction” but had simultaneously set out to “demonstrate to their clients that they could express their talents better by focusing on other sorts of invention.” And as we moved forward in time, to examine its implementation, use, and eventual rewriting, we are hamstrung if we grant “ontological primacy” in the analysis to logics of practice (rather than simply wrestling with the analytic difficulties that follow from a conceptualization of structure and agency as “dual” as Giddens and the pragmatists would have us do). We recognize, of course, that the notion that there is some strategy immanent in the reliance on the practices of learning by monitoring is perhaps congenial to some of the theoretical development of those techniques and their significance in recent years. And the granting of such ontological primacy would have allowed us to identify the effects that recourse to the RASI and associated routines had on error detection and the like across the network. But we would also then have been left to depict the crash test in 2005 that led to the move of responsibility for system performance from TIER1 back to Fiat as a radical breakdown as “more the exception than the rule.” And yet it was, in fact, only the consequence that was exceptional; the instigation—a successful test—would not otherwise seem an obvious moment for the reflexive and agentic revisiting of settled practice.

3.2. Which Agency?

This brings us then to our comparison of the potential gains from an explicit integration of a pragmatist conception of agency into an otherwise conventional practice approach, as opposed to the more general reliance in that approach just on Giddens’ (1984) structuration theory. We have noted already that we follow Sewell (1992) in our identification of the limits to the latter. That is, we understand Giddens’ approach, if unreconstructed, to be flawed by the absence in his writings of any clear theoretical link between his (useful) conception of actors as reflexive, purposive, and knowledgeable and some cognate “vocabulary for specifying the *content* of what people know” (Sewell 1992, p. 7, italics in original). Sewell (1992, p. 4) explains that Giddens does well to delineate the “duality” of structure so that we might construe it simultaneously as “the medium and the outcome of the practices which constitute social systems (Giddens 1981, p. 27).” He usefully distinguishes between two components of structure—*rules* and *resources*—and creates space

for agency in explanation by defining recursively recombined “rule-resource sets, implicated in the institutional articulation of social systems” as ultimately constitutive of structure (Giddens 1984, p. 60). But Giddens does not, Sewell shows, actually provide much guidance to the researcher who wishes to theorize with any clarity the range of rule-resource sets available to and invoked by particular “people who live in particular times and congregate in particular places” (Sewell 1992, p. 10).⁵

We do not claim, to be clear, that the frequent reliance of organizational theorists on structuration theory is in all respects a dead end. It has, for instance, released researchers from the theoretical straitjacket of more deterministic theories, be those theories primarily institutional or rooted in rational action approaches. Such theories obviously tell us little about our case insofar as they require some change in the competitive environment—of which there were none of note across the years studied in our case—to explain repeated changes in the strategic behavior at the boundary between the two companies. So we must acknowledge that release as a step forward and touchstone in the development of so much of the contemporary literature on organizational practice (and therefore as a touchstone also for our own claim—already advanced—to capture goings-on at the boundary between Fiat and TIER1 with a conceptual toolkit drawn from that literature). But again, just because we are freed to explain, and have the descriptive vocabulary to explain, that the same actors may rely on a variety of routines, techniques, tools, and relations (rule-resource set) in different combinations at different times does not mean we are sufficiently guided in our analysis of the whens and the whys—or to put it in terms of questions one might ask about our case, why the move from “modularity” to mere “system supply”? Why turn then to the RASI and learning by monitoring? Why the sudden reliance on the informality of their embedded ties not just when things go awry but suddenly and strongly again when things, on the face of it, seemed to go particularly well?

Pragmatism offers, we think, useful guidance before such questions. It requires the analyst (i) to eschew “spectator theories of knowledge” that would “[deprive] reason in man of an active and creative office” (Dewey 1929, p. 211) and (ii) to conceive of actors as creatures guided by habit until subjected to invasions from without and inventions and innovations from within that radically alter the course of life, and that thus force them to “turn things over intellectually” (Dewey 1938, p. 102) as they “investigate what it would be better to have happen in the future” (Dewey 1939, p. 33). It guides the empirical researcher, therefore, to focus on “indeterminate situations” and to examine the ways in which actors survey themselves and their situations for resources as they make projections of the possible consequences they may obtain should they select some “ways or mode[s] of response” rather than others (Dewey 1922, p. 42). It tells her,

moreover, to recognize those projections—which Dewey referred to as “ends-in-view”—as a “means in present action” (Dewey 1922, p. 226). But it underscores that those ends-in-view are *not* the consequences themselves. Dewey argued emphatically that ends actually reached are not just consequences; they must be recognized also as tests of “valuations previously made” (Dewey 1939, p. 43). And, as Gross (2009, p. 367) explains, he therefore argued that lines of action initiated will sometimes “lead actors to see themselves in new ways, to value different kinds of goods, and to become attached to problem solutions they [had not] imagined previously.”

3.3. Putting Pragmatist Agents into Practice

Integrating these theoretical commitments into our case narrative retains the focus on changes in routines (habits, or “ways of response”) at and around the boundary, as well as the distinction between the ostensive and the performative aspects of those routines so central to the theoretical narrative in §2. We can also still differentiate between the underlying patterns of routine across transitions by contrasting theories of modularity that describe the logic of the new ostensive routines put in place at the end of the 1990s with theories of learning by monitoring that capture instead the logic of the routines associated with the RASI, and with theories of embeddedness and goodwill trust that capture the logic of the alternative set of routines that allowed for the rewriting of that particular management tool. What does change, importantly, is the role that such theories—drawn from the extant organizations and management literature specifically on organizational boundaries and heavily influenced by the sort of “contingency thinking” to which practice approaches are generally opposed—play in our analysis. To eschew a spectator theory of knowledge means to remember that modularity, learning by monitoring, embeddedness, and such managerial and organizational theories are not just descriptors of the logics that happened to come into play at different times at and across the boundary in question. They are not necessarily just convenient names for this or that of various “rules” (in Giddens’ terms). They and the predictions that they allow actors to make can and should, we submit, often be understood simultaneously as resources (to again translate to Giddens’ terms).

There is good evidence that the managers and engineers we have interviewed are themselves aware not just of those logics but have, at least in “folk” versions, their own theories of those logics and their effects. Just as organizational analysts make and assess predictions about the behavior of organizational actors under uncertainty, so too do those actors use such folk understandings to project ends-in-views, to project whether a proposed line of action might in fact transform a “problematic situation into a determinately unified one” (Dewey 1938, p. 117). In light of those

projections, they take ends-as-consequences as tests of their “valuations previously made” (Dewey 1939, p. 43). And we can see this, we think, if we look at the language and behaviors we described in §2. In the very first transition at the boundary, for instance, we are sensitized to the use of passive voice by Fiat’s director of global sourcing when he described the “pressures” on companies in the 1990s to “become global manufacturers, to improve the quality of their products, and, above all, to lower production costs” in ways that had not proved possible with an organizational architecture that centralized most design responsibilities with Fiat. Such pressures are easily read, after all, as Dewey’s “invasions from without,” as the sort of things that might lead managers in the industry to break with established habit and routine and experiment with alternatives. And they give us reason to reframe strategy making and routine formation at the boundary in pragmatist terms.

The big decision by managers at Fiat at the time—their decision to use modules as a tool to go from a situation in which they had to coordinate 5,000 components to a situation in which they could leave everything to five system suppliers once they had designed the interfaces—is recast with modularity as an ends-in-view, as a means for directing action (Dewey 1922, p. 225) that served, concretely, to coordinate a drawdown in Fiat’s investments in personnel and know-how. The decision by TIER1 higher-ups to expand globally and to look for ways to amortize investments in know-how garnered from working with other manufacturers can also be similarly recast. And what results is a narrative where managers’ understandings of the likely effects of that turn—amply represented in the folk business press—are tied together with a set of associated practices into a coherent set of ostensive routines that could, in turn, guide the allocation of goals and responsibilities across the production network.⁶ That narrative is, to be clear, still reliant on the improvisation that inheres in the performative aspect of those routines (an aspect highlighted by Feldman and Pentland 2003, though certainly consistent with Dewey and his interpreters’ conceptualization of habits and routines). But it also directs analytic attention toward breakdowns in ways or modes of response (Dewey 1922, p. 42), which were—as we noted in §2—endemic to day-to-day practice given Fiat’s failure in fact to iron out interactions between components in predevelopment.

Primarily in reversion to settled habit, responses to those breakdowns consisted of the informal modes of coordination and workarounds that had characterized previous practice. This is consistent with the predictions of a pragmatist view, in the sense that those means were readily at hand and did in fact prove sufficient to render otherwise indeterminate situations determinate. But for the organizational analyst, it is important also to account for alternative ends-in-view that were available to the many parties in the situation and that therefore served

as potential resources that could be used to generate alternative lines of action. That is, it is incumbent on that analyst to situate the agent by recognizing, for instance, that our interviewees were aware that other assemblers developing modular product architectures—as Ford prominently was—had not gone as far and had not tried it with the occupant safety system. They knew also that others (Chrysler, for example) had similarly increased their reliance on suppliers but with a strategy that depended less on changes to the product architecture than on efforts to establish the relationships required for an “American keiretsu” (Dyer 1996; see also Fine 1998). And they knew that still others across a range of industries were—as they too soon would—turning to management tools borrowed from Japanese production methods to coordinate the simultaneous engineering of systems and components that interact even across organizational boundaries.

Attention to such alternatives is not unique to a pragmatist analysis, but it does play differently because of the particular understanding of the “creativity of action” characteristic of Dewey’s conception of the situated agent (Joas 1996). We have noted that the availability of a settled habit meant that simple recourse to old workarounds long endured and that they were undone when TIER1 engineers responded to the failure of architectural means to deliver the end state that the companies had projected. That is, they were undone when it became clear not just that the ends-as-consequences were markedly different than those envisioned but that they had not rendered the problematic determinate. That test of valuations previously made (Dewey 1939), moreover, does seem to have forced the actors in question whether to “turn things over intellectually” (Dewey 1938, p. 102) and to reestablish “what it would be better to have happen in the future” (Dewey 1939, p. 66). The line of action they followed, after all, was in fact inscribed neither in the logic of practice ostensibly in place—the logic of modularity—or in the simple application of the RASI and associated routines. The former, we reiterate, should have led them to reverse course if—as they claimed—interactions between systems had rendered the task impossible. And yet what they proposed neither reversed that problematic division of labor nor replaced that logic with an alternative rooted exclusively in the RASI and associated routines.

The pragmatist claim, therefore, is not that the RASI itself was especially “creative”—it was, as we noted, a very established tool. Rather, we can think of its situational invocation as the creative recombination of resources and routines (rules/habits) by actors available to them in the very concrete situation when confronted with a concrete problem. TIER1 engineers were simply casting about for alternatives they hoped might allow to better coordinate activities in light of architectural changes already made. As they did so, the RASI and associated routines were, for them, just one of a range of ways

or modes of response (Dewey 1922, p. 42) that, they projected, could plausibly enable the two companies to continue to work toward the black box delivery of the safety system from TIER1 to Fiat. And, in fact, as we have already noted, the routines that emerged from the writing of the RASI did improve coordination enough that TIER1 was able to maintain overall responsibility for system performance. But again, those routines did not actually deliver—as a consequence—the hoped-for result. And again, actors' resolution of the inevitable problems that cropped up were not resolved just by the improvisation inherent in the performative aspects of routines, but they required situational recourse at the operational level to modes of response rooted in the workarounds and informal-favor trading they had long used to get the product out the door. But this time, with the RASI in place, an established pattern—at least in the main ostensive routines shaping the primary logics of practice—remained in place for years.

The undoing of that particular set of routines, we have shown, came only after that successful crash test in 2005. The demand on us here is thus to explain in pragmatist terms why TIER1 engineers elected to reveal their inability to explain the particulars of that success only in light of success on the very test—the Euro NCAP—that was ostensibly to decide whether black box sourcing was feasible. The answer, from that pragmatist point of view, focuses of course on a situation that was evidently indeterminate to TIER1 engineers: the RASI and associated routines required that they—as the parties responsible for system performance—debrief with their clients after the test, and they did have to say something. But it is not clear that they had to, or that it was even in their interest to, reveal that they were not confident in their understanding of the outcome. Our many interviews at Fiat and suppliers leave us little doubt that the reductions in technical staff at Fiat, coupled with the loss of know-how due to the years away from direct component design, had left enough gaps in the company's technical expertise that TIER1 engineers could easily have maintained the status quo, had they so chosen (see especially Zirpoli and Becker 2011a, b). We can therefore infer that the decision to reveal was purposive and—in pragmatist terms—that it consequently required them to formulate an ends-in-view that could serve as a “means for directing action” (Dewey 1922, p. 225) in some alternative direction.

The range of alternatives those engineers faced was, we underscore, not a simple binary choice.⁷ They were not just deciding whether to reveal or to withhold, with the rest sure to follow. It was not obvious, for instance, that the gaps in their own knowledge were rooted solely or even primarily in a problematic division of labor. They could plausibly have interpreted success on the test as evidence of at least some rough alignment between the product and organizational architecture—that is, after all, what their modified understanding of modularity had predicted.

They could then have underscored the significance of the test as evidence of that alignment but, since they would naturally worry that they might fail the next time around, demand new investments in know-how on the part of their own technical center in northern Europe. And they would have had reason to worry about the reactions of their counterparts at Fiat when told that nobody really quite understood the particulars of interactions in the system for which they—at TIER1—were ostensibly responsible. There were, for instance, many at the assembler whose careers had been heavily invested in the success of the company's turn toward modularity. There was thus reason to worry about resistance to the new investments in know-how that a return of “responsibility” to the automaker would entail, and therefore that some might push future business away from a megasupplier whose competence as a system integrator had been put into doubt.

We have noted already that Fiat and TIER1 engineers' actual response relied upon goodwill trust and their multiple embedding in the broader production network. Such reliance is easily understood in pragmatist terms as the turn toward, and combination of, resources available within the concrete situation in the projection of a solution to some apparent problem. That reliance, to remind, had previously been oriented toward the small-scale problems and need for workarounds that has so long and so regularly emerged since the two companies' joint turn toward modularity. And so, although the creative agency of engineers at TIER1 and Fiat some years earlier had led them to survey the situation and to project that the incorporation of the RASI and associated routines into established practice could allow them to avoid any substantial rethinking of their broader goals, this time around that creativity played quite differently. They had been forced by circumstance after the crash test to compare an observed end as consequence to a “valuation previously made” (Dewey 1938, p. 60). And, as we can see in retrospect, they felt they had exhausted the available means to their chosen ends-in-view, to the black box sourcing the safety system. So they had begun—to borrow Orlikowski's (2000, p. 423) words—to consider “changing their ends,” by which we mean that they stopped looking for means to black box the system and began instead to search for means to reconstruct the goal itself.

This creativity, as in the second transition we narrated, was in many ways banal. It did not incorporate elements—whether resources or rules—from outside the situation, nor did it generate any particularly novel organizational arrangements. In fact, it marked a sort of return to a situation akin to that of some years previous, modified only by the substantive improvements wrought by the writing of a RASI that had made it easier for all involved to identify interactions between systems and therefore to “inform” and to “support” the many third parties involved in the design of the system. But we still get something important—at least from a pragmatist point

of view—by identifying the creative element of even such seemingly mundane decisions and, more importantly, by identifying the essentially *reflexive* nature of that creativity. And Dewey was especially clear on the point. “Ends,” he wrote, are not “frozen and isolated” as “a priori theory” would have it (Dewey 1922, p. 227) (“a priori theory” is his term for what we would now call rational choice approaches; see Whitford 2002). They are, “in fact, literally endless, forever coming into existence as new activities occasion new consequences” (Dewey 1922, p. 232). Nor, however, are they the wishes or “fancies” that Dewey (1922, p. 234) described as little more than some “romantic embellishment of the present.” Such “idealized object[s],” he argued, are converted to “an aim or end only when [they are] worked out in terms of concrete conditions available for [their] realization, that is in terms of ‘means’”—since it is only when “knowledge [is] joined to wish” that activities can be oriented toward purpose (Dewey 1922, pp. 234–235).

So, from a Deweyan perspective, we might reasonably have expected a new aim—the desire to convince Fiat that they risked leaving to “serendipity the fate of the next occupant safety system”—to be occasioned by a serendipitously successful test that offered them some protection against accusations of incompetence. It is convenient to think of this as an occasion in which a line of action initiated led “actors to see themselves in new ways, to value different kinds of goods, and to become attached to problem solutions they [had not] imagined previously” (Gross 2009, p. 367). We can easily make sense of a projection wrought on that occasion from some combination of TIER1 engineers’ knowledge of discontent with black box sourcing internal to Fiat and the further hedge against accusations of incompetency of a goodwill trust sedimented over the years with operational engineers at Fiat. At the same time, though, we are also cautioned by Dewey against the hubris of certainty, against the claim that we might predict in any deterministic sense that some change in governance was inevitable either after that successful test, or even at any other point. We perhaps know, *ex post*, that TIER1 engineers’ projection was borne out. But theirs was a trying out of courses of action no less than was the decision by their higher-ups to turn toward black box sourcing some years previous, with no certainty that the consequence—a successful mobilization “upstairs” by their counterparts at Fiat—would pan out.

4. Conclusion

We have sought to provide a better account of transitions at the boundary between Fiat and TIER1 than can be got with a focus on practices alone, or with a reliance just on Giddens’ structuration theory. The former provides no real way—beyond the *ad hoc*—to explain the turbulence we in fact observed at that boundary. The latter provides too many ways, forcing recourse to the *ad hoc* to understand

how and why one was selected instead of another. It provides no clear theoretical link between actors reflexivity and knowledge and the vocabulary—already well established in studies of practice and routine—for specifying the content of what people know about organization (Sewell 1992, p. 7). Pragmatism, by contrast, requires the analyst (i) to identify moments of indeterminacy, when “customs fail to give required guidance” (Dewey and Tufts 1936 [1932], p. 198), and actors thus project the consequences of different courses of action; but (ii) to recognize also that actors work out and evaluate those ends-in-view in terms of concrete conditions available for their realization (Dewey 1922, pp. 234–235). Our explanation thus (i) highlights the means available to actors in specific problem situations—in our case, the artifacts, techniques, tools, and relations that actors invoked in response to problem situations—as well as associated logics of practice, and consequent projections, encoded in the ostensive aspects of the organizational routines under evaluation, but (ii) recognizes that ends actually achieved also serve as tests of valuations previously made (Dewey 1939), thus helping us to ground actors’ reflexivity in their lived experience.

This provides empirical confirmation (and development) of the claim, justified to date only exegetically and/or in the reanalysis of existing studies, that pragmatism “offers a way of drawing together the habitual and creative aspects of practice, while at the same time transcending the problematic separation between individual and social levels of analysis” (Simpson 2009, p. 1330; see also Adler and Obstfeld 2007, Cohen 2007, Elkjaer and Simpson 2011). And we see this as our primary contribution in the article. But it also means, as a consequence, that the arguments we have made about organizational boundary formation in contemporary manufacturing industries likely have broader implications as well. That debate, which is for the most part in “contingency” terms, has gone well beyond just the simple recognition that “the best way to organize depends on the nature of the environment to which the organization must relate” (Scott 1981, p. 114). There has been a strong tendency in the extant literature as well to focus on the putative “‘fit’ between the resource base of an organization and its strategic location within a competitive environment” (Chia and MacKay 2007, p. 220). This has in turn pit candidate theories for the broader trend away from vertical integration against each other. Our findings, however, show the day-to-day negotiation of activities at those boundaries—and therefore also their practical constitution—to be more fluid and contested than has commonly been recognized.

They show, in particular, that something important gets lost when we ask—as is often done—just whether the turn toward a “new logic of organizing” primarily reflects changes in the artifacts exchanged amid technological shifts that have enabled the development of ever more “modular” product architectures, whether it is due instead

to the diffusion of alternative organizational techniques with roots in the Japanese manufacturing revolution, or whether the breakdown of mass markets has, sometimes for better and sometimes for worse, to rely to a greater degree on relational contracting across their embedded ties. Asking our questions in these terms is conducive to the examinations of broad trends, whether across time or sector. It allows Luo et al. (2012), for instance, to show that modularity has diffused to a great extent in the electronics industry than it has in auto making. It helps Powell et al. (2012) to unpack the ways in which the density and patterns of relationships in different regions explain not just the emergence but also the nonemergence of high-tech clusters in the life sciences. It enables Helper and Sako (1995, 1998) to identify the spread of techniques allowing for greater information sharing even in the “low-trust” environment of the 1990s. And these are, of course, important and useful contribution by any measure. At the same time, though, they have been internal to a frame that would otherwise lead us to expect one logic or another generally to dominate across particular relationships with broad changes in one direction or another coming in response largely to changes in competitive context.

This leaves little analytic room for boundaries—like that between Fiat and TIER1—where an unsettled and contested back and forth of operative routines parallels the unsettled and contested state of academic debate on these same question. One possible response is to dismiss that boundary as anomalous in the broader scheme of things.⁸ We disagree, in part because we can place it in the broader context of our research and think such goings-on common. But we disagree also on the basis of the theoretical commitments we have sought to develop and justify here. Pragmatism reminds us that the theories of modularity, learning by monitoring, embeddedness, and the like that have directed our attention toward the artifacts, organizational techniques, relations, and the like do not belong just to the spectators (nor do the spectators just spectate). Those theories—or at least their folk versions—have been among the resources (means) that managers and engineers at Fiat and TIER1 used to formulate the ends-in-view that, they hoped, might generate some improved fit between their organizational structures and their strategic locations in the competitive environment. And from this perspective, our collective inability to definitively identify precise or even directional relationships between particular resources and particular patterns of governance at organizational boundaries seems less a failure than a finding. It may—when combined with our findings—reflect the simple fact that those resources, at the end of the day, are inevitably less our stuff than the stuff of those who are so constantly responding to, as Dewey put it, invasions from without and inventions and innovations from within that radically alter the course of life.

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Endnotes

¹Megasuppliers such as TIER1, in those years, were nearly all making investments in the development of new competencies as they took on new design responsibilities in the hopes of developing the capacity to innovate in a strategy intended to capitalize on the relative retreat from investments made by Fiat and a series of other assemblers (MacDuffie and Helper 2006).

²In the auto industry—and at Fiat—automotive supply contracts generally share risk by requiring the suppliers to provide much of their engineering support up front at a substantial loss. If the vehicle that results is a “hit,” however, they will have an effective monopoly on component supply for much of the life of the vehicle and therefore recoup those investments (so long as they do not excessively exploit that monopoly).

³Euro NCAP is an institution composed of seven European governments as well as motoring and consumer organizations in every European country, and it organizes crash tests and provides motoring consumers with a realistic and independent assessment of the safety performance of some of the most popular cars sold in Europe.

⁴Most empirical work on modularity has been industry specific. See Campagnolo and Camuffo (2010) for an overview.

⁵See Gross (2009) for further discussion of the similarities and differences between a pragmatist and a “Sewellian” conception of agency.

⁶Managers and engineers do not, as a matter of course, rely on citation in interviews. This is an inference based on claims such as that of an interviewee who said, “The idea of systems integrator that we applied was coupled with the idea of modularity, and sometimes interpreted in the sense that the system integrator should have the competence of integrating systems as its core competence. We thought we could be substantially detached from certain component and systems technologies and focus primarily on ‘architectural’ know-how. For this reason we delegated to suppliers the complete development of certain technologies, those that we did not consider as core.” This interviewee obviously did not reference the seminal article by Sanchez and Mahoney (1996) nor anything similar. He did, however, frame an argument that might as well have. Our point, therefore, is that the “ends-in-view” of modularity was an empirical fact understood to require a complex of practices or “way of response” that “projected” to an outcome consistent

with the underlying causal claims of a folk version of Sanchez and Mahoney's theory. We think the data quite strongly support such a claim. And they do so not just for their invocation of a folk theory of modularity to project an outcome but for their invocation of folk theories of managerial techniques and embedding as well.

⁷See Cabigiosu et al. (2013, p. 663) for a demonstration, with reference to the auto industry, that the definition of interfaces is “neither technologically determined nor the mere result of product architectural choices.” Instead, they show those definitions to be shaped by some combination of “OEMs’ [original equipment manufacturers’] and the suppliers’ capabilities, degree of vertical integration, knowledge and strategic focus,” therefore suggesting not just that managerial agency plays a role but that the range of options is both varied and complex (see also Brusoni 2005).
⁸Ahmadjian and Lincoln's (2001) study of assembler–supplier relationships in the Japanese auto industry represents, in this regard, an exception that nicely proves the rule. They, like us, find that organizational logics pitched in the literature as alternative explanations for the direction of organizational strategy may be intermingled in actual practice. But there are also differences: Where we build our argument around a longitudinal analysis of multiple transitions in the mode of governance at a single boundary, they examine single transitions across distinct relationships and distinct boundaries. Where we focus on a time period in which there are no very substantial changes in the environment that might otherwise explain those transitions, thus allowing us to isolate the causal significance of agency and practice, they ask instead how of contracting in the Japanese auto industry are and are not shaped by “alterations in the form and content of transactions and in the business and technological environment” (p. 684). They are therefore able to show that the “drift” in Japan is not of a piece, that it manifests differently across different boundaries, and that “transactions-cost” and “learning” explanations explain different elements of that variation. Their data structure and focus, however, leave them ill-positioned to recognize that, as we show, the logics underpinning those differences may in fact be brought to bear at the boundary in different ways, at different times, left unexamined if we hew just to a contingency frame.

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