Pragmatism, practice, and the boundaries of organization

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I. Introduction

How ought we to understand how, when, and why organizations collaborate in the design and making of the things they design and make? These questions have garnered enormous attention in a scholarly literature that has expanded rapidly as it has become ever clearer that the large vertically-integrated producers described and theorized by Alfred Chandler (1977) and Oliver Williamson (1975; 1985) are gone, if not for good, at least for now. We find ourselves today in a world marked by a "new logic of organizing" (Powell 2001) in which "most knowledgeable observers" had already by 2001 come to "believe that firms [were] engaging in more long-term collaborations -- especially close information-sharing relationships with suppliers and collaborations around product development -- than during most of the twentieth century" (DiMaggio 2001). And yet, though organizational scholars have come roughly to a consensus as to the "why" of this broad secular shift away from vertical integration -- vertically integrated firms were too inflexible in the face of radically increased increased market and technological uncertainty -- there remain stark and persistent disagreements as to hows and the whens. Despite a consensus that there *is* a new logic of organizing, there is no consensus as to its content, and therefore as to how we ought best to explain the patterns of inter-organizational relations and boundary formation that we see in industry today.

Some analysts have remained essentially true to the theoretical core of Williamson's transactions-cost economics. They argue that rising uncertainty -- a change in Williamson's (1975: 9) "environmental conditions" -- has led companies to pursue novel technical solution. In particular, they focus on changes in the *artifacts* being exchanged

and arguing that the vertical disintegration of production reflects the diffusion of "modular" product architectures that reduce uncertainty in contracting and that thus enable the spread of the networks we observe empirically (e.g. Langlois 2002; Langlois 2003; Sturgeon 2002; Sanchez and Mahoney 1996; Dyer 2000; Gereffi, Humphrey and Sturgeon 2005). Others see renewed attention to social *relations*, and argue that we cannot understand changing patterns of industrial organization until we understand as well just how firms are "embedded" in communities -- be those communities, local, regional, technical, associational, or of some other sort (e.g. Granovetter 1985; Brown and Duguid 1991; Uzzi 1996; Uzzi 1997; Gulati and Sytch 2007; Saxenian 1994; Saxenian 2006). And others still dispute that the characteristics of artifacts and the qualities of the relationships across which they are exchanged are the determining factor. Scholars in this third group maintain that the trends we observe are grounded in specific organizational *techniques* -- developed in Japan, but since copied globally -- that enable a sort of "studied trust" and that thus enable easier collaboration between firms (Sabel 1994; Sabel 2006; Helper, MacDuffie and Sabel 2000; Gilson, Sabel and Scott 2009).

In this article, we speak to the same set of questions as these three perspectives -- how ought we to understand the boundaries of organization -- but we take an entirely different tack. In particular, we take seriously Karl Weick's (1979: 44) call for organization theory to "stamp out nouns" in order to focus on processes – that is to focus on organiz*ing* instead of on organiza*tion*, as well as work in the "practice turn" directing scholarly attention towards the essential role of human action in knowing how to get things done in complex organizational work" (Orlikowski 2002: 249; Orlikowski 2000; Feldman and Orlikowski 2011). We dovetail that call and turn with a (Deweyan) Pragmatist conception of action, therefore endeavoring to document Elkjaer and Simpson's (2011) suggestion that pragmatism might bear consider "potential ... to productively inform the theorizing of ... organizational practices," including especially "strategy work." We apply the resulting "pragmatism and practice" approach to a longitudinal case study of key transitions in the relationship between Fiat Auto and a major supplier – pseudonymously dubbed TIER1 here. We show that standard analyses of organizational collaboration have fundamentally miscast the debate as a sort of "horse race," thus misunderstanding the question as one that might be answered with a critical test to adjudicate between these contending theoretical perspectives. And we argue, by contrast, that advances in our understandings of the cross-boundary coordination of economic activity can best be got by asking not which contending theory is right *in general*, but rather by asking when and how the artifacts, techniques and relations at the center of the main stories are *invoked* – and thus have causal force – in organizational practice.

Our challenge to these contending perspectives is therefore an intentionally orthogonal attack. We do not mean to suggest that the scholarly attention given to the importance of artifacts, techniques and relations in the definition of organizational boundaries and the coordination of activities is itself misplaced. To the contrary. Our engagement with these particular theories is rooted in part in their prominence -- they are real contenders -- as well as in evidence from the field that shows that they do in fact capture a part of the story. However -- and this is a key finding -- that same research shows that each is *no more than* a part of the story. That is, each of the three main approaches successfully explains *one* of three distinct transitions in the governance of the relationship between

Fiat and TIER1, *but none is able to explain all three*. The problem therefore sits less in the theories and their focus on artifacts, techniques and relations than it does in their mode of theorizing. The real culprit, we argue is a tendency in organizational scholarship (1) to abstract away from practice -- "the situated recurrent activities of human agents" (Orlikowski 2002: 253) -- and (2) to rely at least implicitly on what Dewey (1929) referred to as "spectator" theories of knowledge that "[deprive] reason in man of an active and creative office."

We contend, in short, that conventional approaches err in their willful blindness to contextual variation in actors' use of artifacts, techniques and relations. The theories with which we are in dialogue depict agents – to the extent they depict them at all – in mechanistic terms that make for easy prediction. And though we certainly recognize the value of prediction, we dispute that predictions about organizational strategy are generally very accurate when theorists do recognize that those they observe and theorize may themselves observe, theorize and act creatively to remake the social world. The creativity of actors is just too want to remake the bases on which conventional approaches found their predictions. We thus turn to our "pragmatism and practice" approach, which eschews mechanistic understandings of action in which actors simply select the best means to a given ends but that does not eschew an understanding of actors as essentially rational and choosing. We use that approach to turn attention towards "what people actually do" with artifacts, techniques, and relations in "their recurrent, situated practices" (Orlikowski 2000). And we show that an understanding of the ways in which those artifacts, techniques, and relations come to serve as *means* to what Dewey (1958 [1925]: 102, italics added) referred to as "ends-in-view" can help us to understand how economic actors do their "strategy work" (Elkjaer and Simpson 2011).

Dewey's reference -- and thus also our reference -- to ends-*in-view*, rather than just to ends, is no mere linguistic turn. Dewey added "in-view" to distinguish between ends as *results*, and the ends-*in-view* that serve more directly in the moment-to-moment activities of people in their daily lives. He and his fellow pragmatists argue that people generally follow habits -- understood not as rote behavior but rather as an "acquired predisposition to *ways* of response (Dewey 1957 [1922]: 42 emphasis in original). This does not, however, render them as "cultural dopes" (Garfinkel 1964: 244). Rather, Dewey explained, once we recognize that "problem situations" are so common that people are still required regularly to "investigate what it would be better to have happen in the future" (Dewey 1939: 66), we get an understanding of rationality that is both analytically tractable and useful. Pragmatists depict actors as creatures of habit who sometimes encounter indeterminate situation that presents them with conditions that they experience as a need, a conflict, a deficit, or a lack. In those moments, Dewey (1938: 102) wrote, inquiry becomes necessary, that we should expect those actors to "examine ... [and] turn things over intellectually," and that the ends that actually *matter* for rational action are "in empirical fact,... *projections* of possible consequences." (Dewey 1958 [1925]: 86).

Dewey used the point that ends-as-consequence are not the same as ends-in-inquiry to challenge the conventional dualism in action theory between means-and-ends. He wrote that the latter -- as consequence -- flow from the former in a single causal process. He agued that actors know this, and that they are not selecting just means or ends, but rather

lines of action -- means-to-ends. The ends-in-view is in this vision best seen as a sort of "means for directing action" (Dewey 1957 [1922]: 225), while the "end actually reached is [therefore]... a test of valuations previously made" (Dewey 1938: 60). The actors, therefore, should be seen as reflexive experimenters. Because they survey themselves and the situation for solutions to their problems, there is no longer any need for the theorist to assume that means and ends are given prior to action (as in standard rational choice theory). Instead, as Neil Gross (2009: 367) has nicely put it, pragmatist theory holds that "lines of activity are initiated that 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." It depicts "human agency [as] an accomplishment" rather than "something ready made with which we enter this world," and human rationality as social, defined by the "capability of learning, not mere knowledge-possessing" (Kilpinen 2003: 298). And it is hence a theory of a action that slides easily into, for example, Orlikowski's (2000; 2002) work on "collective capability in distributed organizing" as well as into other work in the "practice turn" in organizational sociology.

The question, then, is what difference it makes to inject pragmatism into the practice approach. In the pages that follow, we answer that question (and, as a consequence, the more specifically organizational questions with which we began) by showing that pragmatist action theory simultaneously offers "a way of engaging with ‘how’ practice emerges in real-time rather than [with] ‘what’ practices are in use" (Simpson 2009: 1343). We organize the argument into three main sections (beyond this introduction). In the next (II. Transitions), we introduce the three main approaches – modularity (*artifacts*), learning by monitoring (*techniques*), and embeddedness (*relations*) – most often used to explain patterns of inter-organizational collaboration in manufacturing industries. As we do so, we also use our discussion of those approaches to narrate three distinct transitions in the governance of affairs between Fiat and TIER1.

Interspersing theory and case discussion in this way is a somewhat unusual tack, but it is done here with purpose. It allows us: (1) to highlight the inadequacy for our theoretical problem of a "horse-race"-style narrative that places alternative theoretical approaches on the same conceptual plane (or track) and that thus require a single (rather than situational) winner; (2) to create the necessary space for a more processual and actor-driven emphasis on organizing -- rather than just organization -- and; (3) therefore to show how seemingly alternative explanations can be woven together into a single and superior analysis of the dynamics of inter-organizational collaboration in contemporary manufacturing industries.

We begin the case narrative by describing an agreement between Fiat and TIER1 to "modularize" the objects (the artifacts) to be designed and traded -- a "passive safety system" -- in the hopes of minimizing the need for complex and ongoing coordination of activities between personnel at Fiat and at suppliers. That is our first transition. Our second transition is one that fits instead the predictions of partisans of a "learning-by-monitoring" approach. As Sabel and collaborators would predict, Fiat and TIER1 soon adopted some very specific organizational techniques -- including especially to what Gilson et al. (2009) refer to as a "contract-for-innovation" -- to manage complexities that emerged in the wake of Fiat's decision to devolve full responsibility for the design of the passive safety system TIER1. Our third transition then comes because those

organizational techniques turned out to have precisely the double edge predicted by those who argue that it is actors' "embedding" in social relations that best explains patterns of inter-organizational collaboration. Fiat's contract-for-innovation provided enough transparency and flexibility to paper over a problematic division of labor between Fiat and TIER1. But it also locked that division of labor in place for a while, and it was hence only upended when dissatisfied operational personnel found a way to use more informal ties (relations) to each other to mobilize support for changes to that contract.

The penultimate section of the paper (III. Pragmatism and Practice) finally brings our own perspective explicitly to bear on the case and on the finding that a mélange of the three dominant approaches is required to explain the evolution not just in moments but across time of the governance of the relationship between Fiat and TIER1. We first make clear that none of the three perspectives offers much insight into one especially curious and interesting event: our third transition occurs only after a *successful* crash test -- a result that one might have expected to have cemented the existing division of labor in place. This, we argue, shows that the dominant approaches tell us more about the transition *to* a "new production paradigm" (Whitford 2005) than they do about variations and patterns of change *within* that paradigm. We then use a re-narration of the transitions to show how explicit attention to practice, coupled with a pragmatist conception of agency, allows us to weave the dominant approaches together into a single, theoretically consistent, and dynamic narrative of the evolution of the relationship in question. We do this by redirecting attention away from organization and towards organizing, and by showing that artifacts, techniques and relations matter only if and when they serve: (1) as means that actors use to hypothesize ends-in-view that might render problematic situations determinate: (2) in action, as actors draw on those ends-in-view as means to mobilize support from other actors for their proposed solutions (that is, in efforts to coordinate their routines (habits) with others; see Cohen 2007). The concluding section (IV. Conclusion) recaps and draws some more general lessons.

II. Transitions

Our empirical narrative sacrifices breadth for depth by focusing on the evolution of the relationship between just two organizations rather than giving a broader but less detailed account of many of them. However, we are careful also to locate that focal relationship in the context of the evolution of the larger production network. The supplier in question, TIER1 ranks among the world’s leading automotive suppliers operating in more than 20 countries and employing approximately 65,000 people worldwide and makes an array of components for Fiat. At TIER1, we conducted 14.5 hours of interviews across eight different individuals: we spoke with the plant director in 1999, with three managers in purchasing and quality at a satellite plant in 2002, and conducted long interviews with the company's Fiat account director and with a program manager on two separate occasions in 2006. At Fiat, we have conducted 42 semi-structured interviews with 34 different persons employed by Fiat Auto. In the production network more generally, we have

conducted an additional 65 interviews at 40 different first and second tier suppliers between 1998 and 2010 (beyond TIER1; some of these were suppliers to TIER1; others were peers).[1] At Fiat, interviews have been conducted with a very broad array of personnel, including both senior managers (e.g. the Chief Technology Office; VP of purchasing) and with more operational staff (e.g. managers in charge of vehicle lines). At suppliers, we have generally sought out those responsible for the commercial relationship with customers and those in charge of component or system development.

These interviews have, over the course of many years, served as grist for an array of papers. In recent years they have been organized and gaps filled in as part of a larger project on the evolution of the production network that revolves about Fiat. The decision in this paper to focus here more narrowly on the relationship between Fiat and TIER1 to the relative exclusion of other inter-organizational relationships reflects the goals of the article. We aim here to build theory, and have therefore selected from our broader qualitative dataset a case that was "very special in the sense of allowing one to gain certain insights that [an analysis of] other organizations would not be able to provide" (Siggelkow 2007: 20; see also Eisenhardt and Graebner 2007). And while we do bring comparative insights from our broader study to bear where relevant in the narrative, we generally focus on just this one relationship. It is "very special" for our purposes because it is marked: (1) by a change in the division of labor concerning the engineering and design activities between Fiat and TIER1; (2) social relations between individuals within and across organizational boundaries are complex and "many-to-many," so that different individual relationships may matter be more or less salient at a given moment ; (3) the overarching mode of transactional governance in the inter-organizational relationship between Fiat and TIER1 varies across time, as do the artifacts and techniques that the two firms used to manage their collaboration.

Modularizing

A *modularizing* transition in the governance of the relationship between Fiat and TIER1 came in the late 1990s, and was (naturally) consistent with the predictions of what we are here calling the modularity approach.[2] Partisans of that approach hold essentially true to

[1] A list of interviewees (with identities masked) is available from the authors upon request. The interviews were conducted in three waves: 21 were conducted between 1998 and 1999; 20 were conducted between 2001 and 2003; and 74 were conducted between 2006 and 2010. Interviewee were identified and contacted in a variety of ways, ranging from cold calls to snowballing and were generally conducted in Italian (with translation here by the authors). When respondents were amenable, which they were in the vast majority of cases, interviews were taped and transcribed.

[2] There are several definitions of modularity. Baldwin and Clark (2000)define modularity as a decomposition scheme that assumes independence between modules, with interdependencies confined within module boundaries. Modules therefore interact only across standardized interfaces. Ulrich (1995: 422) provided a somewhat different but also influential definition of modularity. In his definition, architectures are modular if there is a one-to-one mapping from functional elements to the physical

the core of transactions cost economics, in the sense that they expect (*ceteris paribus*) that uncertain, frequent and asset specific transactions will be governed by hierarchy (Langlois 2002). This does not mean that they remain fully aligned with Williamson's (1975; 1985) work on the M-form, but rather that they have argued that the broader trend towards vertical disintegration is best explained with reference to changes in product architectures, including especially the standardization of interfaces, that have eased the coordination of external sources of innovation in the product development process (see e.g. Langlois 2002; Sturgeon 2002). Drawing heavily on managerial and engineering literatures, this approach claims that modular *product* designs that allow parts (be they physical or conceptual) to be engineered in relative isolation from each other should enable "the design of loosely coupled, flexible, 'modular' *organization* structures" (Sanchez and Mahoney 1996: 73, emphasis added). And it therefore holds that that governance forms are a function of transactional conditions, and that transactional conditions are themselves essentially a function of technologies. Modular products -- the story goes -- incorporate the information needed for coordinating external sources of innovation in the product development process, hence render assets less specific, and therefore alleviate the need either for vertical integration or for "thick" ties between organizations.

The degree to which modular product designs have spread is the subject of not a little debate, including especially in the auto industry where there is great controversy over just how far modularity can be taken the design and making of something so complex (MacDuffie 2008; Zirpoli and Camuffo 2009).[3] For purposes here, however, the salient theoretical points -- and point on which there is clear consensus -- are two. First, many automakers were at the least intrigued by the idea. Helper et al. (2002: 6) , for instance, reported finding "substantial variation in OEM strategies for modularization, in decisions about module boundaries, in whether modularization extends into design, and in the degree to which modularization and outsourcing are always coupled." They observe also that suppliers interviewed in the 1990s often cited "modularization" as a primary motivation for the wave of supplier mergers and acquisitions, and explained that it had led them to build "capabilities to take on full responsibility for module design and production" (see also MacDuffie 2008; Ro, Liker and Fixson 2007). Second, there is general agreement now -- and there was at the time -- that Fiat in 1990s and early 2000s went further than most in their efforts to develop modular product architecture. (Camuffo 2004; Zirpoli and Caputo 2002; Zirpoli and Becker 2011a).

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components of the product, which specifies de-coupled interfaces between components. See also Sanchez and Mahoney (1996). In this article, we follow Baldwin and Clark's (2000) definition.

[3] Much empirical work on modularity has been industry specific (Fixson and Park 2008; Fixson, Ro and Liker 2005; Tiwana 2008), with particular attention paid to the successes of modular product architectures in the mitigation of coordination problems in electronics (Baldwin and Clark 2000; Sturgeon 2002) and bicycle making (Galvin and Morkel 2001). See Campagnolo and Camuffo(2010) for a recent overview.

Hence, when we say that the transition in question was in the first instance consistent with the modularity position, we mean that company leadership at both Fiat and TIER1 made a series of strategic decisions in the 1990s explicitly premised on the belief that once-sticky organizational coordination problems of a sort that had previously been resolved by fiat in hierarchies could be resolved instead by essentially technical means. Our research shows that these decisions did lead to significant changes in the governance of the relationship between the two organizations. At Fiat, for example, we were told by managers that the company's main strategic concern in the mid 1990s had been to "reduce [their] assets and overall development costs and, at the same time, to leverage external sources of innovation." "It was for this reason," they said, that the automaker decided "to use modules as a tool to go from a situation in which [they] had to coordinate 5000 components to a situation in which [they] could leave everything to five system suppliers once [they] had designed the interfaces." And at TIER1, we were told that Fiat's turn toward modularity had been received enthusiastically since the company had already been making in-house investments in technologies intended to position itself as a global provider of "passive safety systems." TIER1 management told us they were supportive of Fiat's push towards complete systems outsourcing because they saw it as an opportunity "to learn about the process of system integration" in exchange for "component-specific knowledge that [they] had developed working with other car makers."

This enthusiasm at TIER1 led the supplier to bid for, and eventually to win, the contract to provide the "occupant safety system" for Fiat's "Project X." Project X was launched in 2001 at a time of sales and financial difficulty at the Italian automaker, and was an especially important project. It was -- to quote a Fiat project manager -- the "milestone for the new Fiat deal," in the sense that the project not only broke with some past practices but that the company hoped (and needed) Project X to come in on time, on budget, and well enough to produce a top selling car. The acquisition of this contract also marked a significant turn in the governance of a relationship between the two companies. TIER1 had entered the Italian market by purchasing an existing Italian supplier in the late 1980s, and had since then considerably expanded its presence in the Italian market -- and hence its place in Fiat's supply base. However, prior to the contract for Project X, TIER1 had only been a supplier of components in a relatively straightforward co-design relationship. TIER1's R&D headquarters elsewhere in Europe would develop technologies, sometimes on their own initiative, sometimes in response to problems posed by clients, and would then hand them off to engineers at the company's Italian division. Only then would those engineers customize those technologies for more specific uses in specific Fiat applications ("application engineering").

In the customization of components in a co-design relationship, there is necessarily considerable back-and-forth and mutual adjustment. But the lead firm -- in this case Fiat -- takes responsibility for the overall performance of the various systems that make up the car. When it was a co-design relationship, Fiat personnel were expected to maintain the know-how necessary to design the entire system (at least in its broad contours) and to make decisions about performance tradeoffs 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. With Project X, by contrast, these three tasks were devolved instead to TIER1.

A TIER1 interviewee explained that this meant that the “passive safety system” would be purchased as 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 (Clark and Fujimoto 1991). Fiat would then pay TIER1 relatively well for its services, but would also hold them “responsible for obtaining 5 stars [the maximum] on the Euro NCAP crash test." The Euro NCAP test was used both because it has substantive marketing value and because it provides an independent assessment of the safety performance. It therefore offered a means of measuring the success—or the lack thereof—of the occupant safety system and therefore of the performance of the party responsible for its design.

Learning (By Monitoring)

The second significant transition in the governance of the relationship between TIER1 and Fiat in the years studied comes shortly after the first, and is one that stands in contrast to a key prediction made by partisans of the modularity approach. The modularity approach predicts that the real work in "black boxing" the safety system is done up front in the development of the architecture -- and collaboration is needed there. But, once the black-boxing decisions have been made, it should either reduce the need for Fiat personnel to coordinate activities with suppliers; or, in the event that black-boxing failed and it turned out that the input, output, transfer and performance characteristics specified do not prove adequate to their task, the decision would be reversed in light of poor results (since the those results are easily measured). In empirical fact, however, neither of those options occurred. Instead, despite what all agree were extensive efforts to revamp the company's product architecture, coordination problems with suppliers persisted. And this -- as those adhere to the “learning by monitoring” approach would predict -- led the two companies to turn to precisely the sorts of organizational techniques that Charles Sabel and collaborators depict as the functional core of the decentralized and networked firms of twenty-first century (Sabel 1994; Sabel 2006; Helper, MacDuffie and Sabel 2000; Gilson, Sabel and Scott 2009).

Partisans of this approach argue that the decentralization of production that has so transformed global manufacturing industries was neither caused by, nor even especially enabled by, the advent of technologies that would allow for more modular product architectures. It is not technologies, they argue, that have engendered the easier coordination that might explain companies' reduced need for the protections of hierarchy. Yet they differ also with those who argue that the effective spread of collaborative network production requires the formation of the sorts of culturally imbued thick trusting relationships often seen as characteristic of Japanese-style subcontracting. They contest proponents of the modularity view by arguing that the relentless need for innovation that characterizes so many final markets means that firms who might be so foolish as to fix standards do so at their peril, since to do so “leaves open too many possibilities for competitive improvements that would cumulatively undermine the initial interface” (Gilson, Sabel and Scott 2009: 447). They contest the embeddedness view, meantime, by showing that it requires firms to rely *only* on those parties with which they have long-

standing relationships. And though they concede that relationships and trust may explain some instances of collaborative production, they argue that trust cannot possibly explain the more general trend towards vertical disintegration: it is simply too unlikely that very many will have lucked into trusting relations with partners that happen to be at the cutting edge of the technologies they need at a given moment.

Sabel and collaborators' own view is built around the claim that the famed successes of Japanese-style subcontracting in the 1980s have been radically misinterpreted by many social scientists. Those successes, they note, are often seen as dependent on a particular cultural milieu. And they differ. They argue that they were in fact the result of a series of very specific, and codifiable, organizational techniques that originated in engineering practice, drifted into managerial practice, and that have since been distilled and translated globally. They point out that those techniques have not just been widely diffused by pilgrimages of western managers to Japan in the 1980s and 1990s, but have been actively spread by Japanese producers only too eager to bring their own suppliers up to speed. They hold, in short, that the trend towards vertical disintegration is best explained with reference to the spread of "lean practices" like benchmarking, root cause analysis, but also what Gilson et al. (2009: 1) refer to as “contracts for innovation” that “[braid] explicit and implicit contracting to support iterative collaborative innovation by raising switching costs.” In combination, these practices ostensibly “increase the mutual transparency of the actors to each other, revealing to each how rigorously and cooperatively the others scan for solutions in addressing joint problems of design or quality.” And this in turn allows for a sort of “studied trust” (Sabel 1993) that enables parties to “contribute to the redefinition of interface specifications for new products by building on their experience in manufacturing existing models” (Gilson, Sabel and Scott 2009: 1).

Applied to our case, the learning-by-monitoring approach predicts that Fiat and TIER1 could be expected to fail to standardize interfaces enough to render the passive safety system essentially modular, and that they, like other firms in their industry, would turn then to novel organizational techniques gleaned and translated from the Japanese experience to govern their affairs. And this is in fact exactly what we found. Engineers at Fiat and TIER1 quickly recognized that the decision to “black box” the design of the passive safety system had created considerable confusion. As we were told by an interviewee at TIER1, the goal of a five star rating was to serve as a guide for the coordination of activities across what had become a complex supply network jointly governed by Fiat and TIER1. That guiding objective, however, had also to be translated into sub-objectives: “If the seat doesn’t work right in the crash test, you don’t get 5 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.” And those contingencies affected not just TIER1 but other players. For example, changes to door coverings would have to be cleared not just with a specific supplier selected by Fiat and perhaps also with a second-tier supplier of materials, but also with Fiat’s marketing department given that they affect the “look and feel” of the vehicle.

These sorts of complexities made the division of labor very hard to manage. "When things don’t work," explained one engineer, it is very hard to know who is at fault; it is

very rare that you know this at the end of the project." Those complexities were also qualitatively different than the sorts problems that TIER1 had previously managed. They were not the sorts of technical problems that generally fell in their bailiwick. They had come into Project X from a co-design relationship that had been straightforward enough that they had been able to managed through relatively simple informal communications and consolidated inter-organizational routines. At that time, design and engineering responsibilities were established during the pre-offer phase on the basis of what our interviewee at both Fiat and TIER1 describe as "gentlemen's agreements." System supply was far more complex, and required coordinating with far more players. And it quickly emerged in the wake of the turn towards system supply, those informal agreements were no longer up to the task.

The response, we were told, was that the parties turned to what Gilson et al. (2009) refer to as a "contract for innovation" that, they hoped, would explicitly but flexibly codify the roles that each actor was to take in the management of those interdependencies. That contract, called the "RASI" consists of a matrix, where the rows list activities to be carried out within a given component/system development project (the "whats"). The columns carry the names of the suppliers involved or potentially involved into the project (the "whos"). And the cells define the roles in accordance with four letters. R means the listed who "is responsible" (e.g. for the complete engineering and design of a component or system in the case of TIER1; for the seats in the case of another; etc.); A means the listed party for "has to approve" (e.g. TIER1 might have to judge and approve another supplier's design and engineering activity before the latter is completed). S means the listed party "has to offer support" (e.g. technical information); and I means "must be informed" (some suppliers have the right to be informed in order to avoid miscoordination in concurrent engineering activities). Note that with the exception of the "R" – which tends to land with system suppliers – the "approval", "information" and "support" indications are characterized by reciprocity: a "duty" for one corresponds to a "right" for another.

It is a type of tool that had existed for many years (and that comes in many varieties; others use, for instance, a RACI or a RASCI, where the "C" is for "consulted). Matrices of this sort are common in project-based work (as partisans of the Learning-by-monitoring approach would surely note in reference to our case). The RASI in question is significant for two reasons. First, nothing of the sort had previously been especially important in the governance of a relationship that had had highly consolidated inter-organizational routines established across many years of co-design. Second, the writing of the RASI was very much a joint exercise, sustained on the one hand by Fiat's recognition that TIER1 had knowledge that they needed, and on other by TIER1's perception that Fiat's dedication to the writing up of the RASI with them represented a sign of commitment to the relationship. In fact, the completion of the RASI in question took more than six months of joint work between TIER1 and Fiat engineers.

It was developed as they sought jointly to identify the management tools (e.g. inter-functional teams, co-location, etc.) necessary if they were to implement some semblance of black box sourcing, and negotiated the content of the "letters and boxes" across an array of suppliers. It was not easy: a TIER1 interviewee explained, for instance, that they

might say to Fiat “look, in our opinion it’s not right that we be responsible here, because the dash supplier is involved and there we ought instead to give approval"; but this then requires the involvement of Fiat and negotiations with the dash supplier perhaps some second tier suppliers. For example, “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 is to make these sorts of changes in conjunction with Fiat.”

This heavy investment in an organizational tool was deemed necessary in light of what a TIER1 interviewee described as "Fiat's big problem at the time": neither Fiat nor TIER1 really understood "how to manage the development of a system that had been completely outsourced.” In short, the turn to the techniques of Learning by monitoring grew out of a recognition by all parties that they did not quite know how to jointly manage system supply, but that they knew where to learn how to manage system supply. They all lived in an engineers' milieu in which such techniques and tools had, in the wake of the Japanese manufacturing revolution, spread far and wide. They knew *of* semi-formalized tools like the RASI. They had just not previously seen a *need* to invest the time in its customization to the task at hand. Glitching in their joint turn towards modular system supply had generated -- again in the words of a TIER1 interviewee -- “a clear desire at Fiat ... to decide the responsibilities of the system supplier." But, there was also "the shared need to decide what the key technical moments were because either Fiat or TIER1 had to be responsible for each activity.” Hence, “in the initial writing of the RASI with Fiat’s technical division, [TIER1] jointly designed the matrix and decided where to assign responsibilities.” Because it was TIER1 that held the detailed knowledge of component design and thus of potential interactions, TIER1 necessarily played a very important role in deciding not only what letters went in the cells, but also the very structure of the matrix. The global systems supplier therefore had considerable input into the decomposition of activities and thus the feasible set of divisions of labor across sub-objectives.

Embedding

The third transition in the governance of the relationship between Fiat and TIER1 comes in the wake of a signal event. In 2005, after a successful crash test, Fiat and TIER1 engineers held a “debriefing” to consolidate lessons learnt and to draw best practices they might extend to future projects. In that meeting (which was not the first such debriefing), TIER1 and Fiat engineers openly recognized that nobody knew quite why the system had worked. A TIER1 engineer told us that the supplier had made many of the decisions on tradeoffs even though “they did not control the design of all the subsystems involved” and 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.” The result, he said, was that Fiat engineers decided that “they could not leave to serendipity the fate of the next occupant safety system.” And, once Fiat and TIER1 brass were brought into the equation and after some further negotiation

TIER1 and Fiat finally and fundamentally revisited the base RASI. Overall responsibility for the performance of the safety system was returned to the automaker -- with some attendant costs and investments in know-how -- while TIER1 became responsible once again only for the development of parts and components.

It is not surprising that a qualitative shift in the form of relational governance would occur in the wake of such a major test. But it is curious that such a shift would occur 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 transfer of "responsibility" back to Fiat obviously represents a clear rejection of the modularity approach, given that black-boxing the system was rejected notwithstanding its apparent effectiveness in the very test that was ostensibly to measure that effectiveness. The learning-by-monitoring approach fares better. It is certainly telling that the RASI *per se* was not scrapped. Indeed, not only did the renegotiation of the boundary between Fiat and TIER1 amounted in practice to the re-writing of the RASI, but Fiat continued to use the broader mapping of interdependencies developed with TIER1 to govern the system's design across a multitude of firms. It is notable also that the existence of a "debriefing" for purposes of benchmarking after a milestone event like a crash test is -- like the RASI -- part and parcel of the "new pragmatic disciplines" so central to the "learning by monitoring" position (Sabel 2006). 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.

That explanation, to our read, requires reference to what Granovetter (1985: 484) famously referred to as the "embeddedness" of economic action. The many scholars who take this approach argue that social and personal relations are not "frictional" but are rather constitutive of economic activity. Following Granovetter, we would expect complex transactions to occur across organizational boundaries more often where there is a "stable network of relations" not only at "top levels" but "at all levels where transactions must take place" (Granovetter 1985: 496). These relations, the argument goes, can be expected to mediate those transactions, "spilling over into sociability" and generating "standards of expected behavior that not only obviate the need for but are superior to pure authority relations in discouraging malfeasance" (Granovetter 1985: 498)..This insight has been used by Uzzi (1997: 54), for example, to show that a strong social overlay – an "embedded" tie – between actors across organizational boundaries can "reduce product development risk" insofar as those ties help actors to safely "identify and execute coordinated solutions to organizational problems." And, when applied to our case, it is an insight that directs our attention towards the informal working and social relationships between managers and engineers that served to lubricate complex transactions in the absence of even the semi-formal directives laid out in the RASI.

The RASI, as it turned out, had given enough formalization to roles and responsibilities to make the black-box outsourcing strategy barely workable. But the negotiation of those roles and responsibilities at a particular point in time 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 too costly to define a new RASI for each new project. Instead, "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 in this case was one with a structure 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, it was conditioned by TIER1 leadership in Germany similarly committed to developing the capacity to provide ever more complete safety systems not just to Fiat but other assemblers as well. The result was a RASI explicitly designed to ensconce a modular logic into the distribution of organizational roles across the production network. It was, in short, *intended* not just to enable but to constrain. It was to coordinate the many roles and responsibilities in complex product design, but also to systematically channel particular actors into particular roles.

The relative formalization of roles and responsibilities proved a double-edged sword. The TIER1 and Fiat engineers who were actually responsible for the design of the system were, in the terminology of the embeddedness perspective, "multiply embedded." They were located in their respective corporate networks, which meant that they had some incentive to make the proposed structure work. But at a more operational level, most of the work was done by TIER1 personnel located in Italy, tasked primarily with "application" engineering on projects for Fiat. Their careers were therefore heavily tied into the fortunes of Fiat. Those engineers therefore retained longstanding relationships with Fiat engineers at multiple levels, including especially with the numerous players involved in what is called the "platform team." [4]

[4] On the TIER1 side, the number of people primarily involved is relatively small. There is a program manager who is in charge of commercial issues, and a project manager and her team in charge of technical issues. Others are brought in from abroad as needed. In principle, the program manager deals with Fiat's purchasing department, and the project manager deals with technical staff on the product platform team (though as the system becomes more complex, these roles may break down. At Fiat, people (and thus organizational units) regularly involved in the New Product Development process that also deal with suppliers are: the platform director who has the last word on important changes in the project schedule or component changes and is the last resort to settle disputes with suppliers; the vehicle project leader who is in charge for the development of the whole vehicle; the system team leader who is in charge for specific system development; the component development leader who is in charge of specific component development; the supplier quality unit that evaluates the observance of technical specifications; the performance engineer responsible for a particular vehicle's performance deals with the supplier when its development affects relevant aspects of performance; a representative of the purchasing function who is stably on the platform to deal with commercial issues and cost monitoring; a representative of central purchasing who intervenes in the case of changes in the contract or on relevant changes in the price of the component due to modifications; members of the experimentation labs who work together with the supplier to build prototypes; members of the technology division who work together with the supplier to define the production technologies; representatives of the manufacturing division who work together with the supplier to manage the production rump up and address quality problems; members of cost engineering who

The members of the platform team, meantime, had seen their lives complicated considerably by the shift from component to system supply. It had not just radically increased the number of people and organizational units at Fiat with which they had to coordinate activities; it had also forced them to manage relations with third party suppliers over which they had little contractual power, no substantial history across which to have developed trust, and in many cases no technical superiority. Interviewed parties told us that the RASI was an enormously helpful management tool. It structured when, where and how they were to turn to Fiat for help managing those relations. But they also made it clear that the RASI had in many ways made their informal ties to each other even more important than they had been before. This not so much because there were still the inevitable workarounds and the spot circumvention of the division of labor laid out in that matrix -- though that happened. It is because TIER1 engineers knew what they could and could not say without risking the contract. They had felt safe revealing that they did not know why the crash test had worked only because they were in the presence of trusted parties.

III. Pragmatism and Practice

We have argued to this point that each of three prominent approaches to the study of inter-organizational relationships captures the essence of one -- but only one -- of our three transitions. We are obviously convinced that there is a problem here, and hope the reader is too. But we suspect that proponents of the different theories respond would likely defend themselves. Those who take what we are calling the "modularity" position might argue that Fiat and TRW merely *sought* to develop a modular architecture; that they failed to develop that architecture; that they had access to "trust" as an alternative, if second best, means to govern their affairs; and, as a transactions-cost theorist might expect, that they hence turned in the wake of their failures to that trust to govern those affairs. Partisans of the "learning-by-monitoring" approach, for their part, would surely dismiss our first transition as the mere result of mistakes made by managers caught up in a pro-modularity managerial rhetoric that was sweeping the automotive industry at the time, and can point out that the renegotiation of roles and responsibilities was ultimately channeled through the RASI. And champions of the embeddedness approach could point to the ways in which informal relationships and trust were a constant, and note that they helped Fiat and TIER1 to get product out the door even despite their inability to properly delineate parties' roles and responsibilities until after our third transition.

We think that such objections miss the mark by virtue of their insistence on a "horse-race" theoretical paradigm. We have sought to show that the dominant approaches are fundamentally miscast as *alternatives* (See especially Sabel and Zeitlin 2004; Gilson,

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intervene to evaluate request for changes in the development of the component supporting the purchasing unit with technical advice.

Sabel and Scott 2009 for a clear exposition of the claim that the approaches ought to be seen as alternatives). Perhaps curiously given their opposition to each other, the defenses available to the three approaches suggest that they are better cast as allies -- some revolutionaries and some reformists perhaps, but still situational allies -- against Williamson (1975; 1985) and Chandler (1977). They are jointly -- and quite successfully, attacking the once-standard presumption that returns to scale and the dangers of opportunism, hold-up and other "agency problems" would all but inevitably lead firms to integrate vertically. Partisans of the modularity approach are the reformists: they show how technological advances allow actors to encode once-tacit knowledge in artifacts, rendering private information superfluous. The others are our revolutionaries: theorists of learning-by-monitoring document an important and novel series of organizational techniques that obviate some of the more rigid safeguards of classic hierarchy; and studies of embeddedness attack the undersocialization of Williamson's actors and remind us that those same informal social relations that were so consequential internal to the Chandlerian firm (see e.g. Cyert and March 1963) also ease goings-on between the more porous organizations that characterize the current era.

The dominant approaches, in short, tell us more about the transition *to* a "new production paradigm" (Whitford 2005) than they do about variations and patterns of change *within* that paradigm. This comes clear if we re-examine why it is that Fiat and TIER1 revisited their division of labor only at the conclusion of a successful crash test. Those who subscribe to the modularity approach expect managers to read such successes as evidence that artefactual solutions are at least potentially feasible, and predict that they will rationally endeavor to further bend the product architecture to meet the needs of an existing (and otherwise optimal) organizational architecture. A focus on organizational techniques, for its part, does direct our attention towards the semi-formalized moment of "debriefing" in which TIER1 engineers were able to air their concerns. But while that moment is exemplary of the companies' adherence to the principles of "learning by monitoring," it was only *enabling* of change; it does not tell us why that change came only after success. The embeddedness perspective, meantime, is quite right that attention to trust and social relations is required if we are to explain why TIER1 engineers were willing to reveal that they did not know exactly why the crash test had worked. But again, those relations were merely enabling. TIER1 engineers had for some time recognized a mismatch between product and organizational architecture, and the embeddedness perspective does not tell us why they awaited the conclusion of a successful test to voice their concerns.

Different however is our understanding when we re-examine those transitions in terms that inject a reflexive pragmatist actor into theories of organizing as developed across the "practice turn" in organization (Orlikowski 2000; Orlikowski 2002; Simpson 2009). The practice turn -- which we briefly outlined in our introductory section -- first directs attention towards the *use* of artifacts, techniques and relations "in the situated, recurrent activities of human agents" (Orlikowski 2002: 253). And it second emphasizes that those artifacts, techniques and relations "structure [their] users actions" only when they are *used* "in recurrent social practices" (Orlikowski 2000: 408). Our reliance on Dewey's writings for our model of action, meantime, leads us to expect actors generally to be guided by "habits" in their moment-to-moment activities -- which is notably akin to the

emphasis practice theorists' give to "recurrent activities." It also means that we, like organizational theorists who have taken the practice turn, focus especially on "invasions from without and inventions and innovations [from within that] radically alter the course of life" and that therefore place actors in situations in which "customs fail to give required guidance" (Dewey and Tufts 1932: 197).

This reliance on a pragmatist conception of action pushes the practice turn forward in one important way. Theorists in that turn have to date generally limited themselves simply to *recognizing* that actors who find that particular technologies (or, in our case, artifacts, techniques and relations) do not serve their ends may not abandon those technologies (that is, those means) and might instead therefore "think about changing their ends"(Orlikowski 2000: 423). The explicit incorporation of Deweyan pragmatism into such practice-based theorize, by contrast, enables us to explore the implications of that recognition. It demands that we (1) reject "spectator" theories of knowledge that "[deprive] reason in man of an active and creative office" (Dewey 1939: 60); (2) recognize that the "ends" of action are, "in empirical fact" ends-in-view or "projections of possible consequences," and are not the consequences themselves; and (3) recognize as well that "actually reached" are in effect tests of the validity of those projections ("tests of valuations previously made"); and (4) therefore leave space in theories for actors to respond creatively to their own observations.

In our own case ,this means construing the putative causal dynamics that underpin the modularity, learning-by-monitoring, and embeddedness approaches not just as hypotheses *about* action, but also as hypotheses that the actors themselves might *use*, if only in "folk" versions, to act. That is, we want to construe transitions in the relationships between Fiat and TIER1 as situational tests by the actors themselves of the different approaches, taken when established ways of doing things had somehow broken down. They are occasions when actors have reason to explore the means available to them, to project the likely consequence of those means, to act in the hopes of transforming a “problematic situation into a determinate situation" (Dewey 1938: 117), and -- going forward -- ultimately to assess the consequences of their valuations previously made.

Our first transition, seen in this light, directs our attention to the "problem situation" that occasioned some reconsideration of established practice. Interviewees -- across Fiat and at a multitude of suppliers (not just at TIER1) -- agreed with a sentiment expressed to us by Fiat's director of global sourcing. The director notably used passive voice to describe "pressures" in those years, citing the need for companies to "become global manufacturers, to improve the quality of their products, and, above all, to lower production costs."

These are nothing if not Dewey's "invasions from without." It was only in response that managers at Fiat broke with established habit and routine by exploring the idea that Fiat might “use modules as a tool to go from a situation in which [they] had to coordinate 5000 components to a situation in which [they] could leave everything to five system suppliers once [they] had designed the interfaces.” It was also in this context, and reacting to these same pressures, that TIER1 higher-ups began to expand globally and to look for ways to amortize investments in know-how garnered from working with other

manufacturers. However -- and this is the key point -- both sides were aware that their decision to redesign the artifacts to be exchanged was but one of many potential means by which Fiat might "leverage external sources of innovation" and, at the same time, lower production costs (relative to vertical integration -- which was seen as off the table). And it was but one means by which TIER1 might amortize investments by coordinating a larger share of the value chain (they could, for example, expand horizontally rather than vertically).

A focus on practice with a pragmatist lens does not lead us to expect significant breakdowns or failures even though Fiat and TIER1 never did manage to develop the modular product architecture that -- as their end-in-view -- was broadly guiding the allocation of goals and responsibilities across the production network. Instead, it would lead us to expect engineers at the operational level initially to revert to the more informal coordination and workarounds that had characterized previous practice, since those means were so readily at hand. The perspective allows easy comprehension of the finding that changes that had occurred in organizational structures and in the artifacts -- Dewey's inventions and innovations from within -- in fact occasioned further deliberation between Fiat and TIER1 as to how they might simplify the coordination of their joint activities in light of the evident failure of artefactual means to deliver the end-state projected either by Fiat or TIER1. It also offers a ready explanation for the finding that this end (consequence) and this initial valuation of the effects of that means did not lead them to revise an end-in-view in which the division of labor between the parties was essentially modular. The perspective predicts that indeterminate situations will often generate creative use of means available in social situations, including for example the selection of a means -- like the RASI and associated organizational techniques -- that actors might plausibly expect to combine with artefactual changes already made to solve their problems.

Yet as we have seen, the RASI did improve coordination but did not deliver the shared end-in-view towards which it had been developed and mobilized. And again, we saw engineers at the operational level simply returning to established ways of doing things. They returned to habitual social relationship and established practices they knew to be effective means by which to generate the sorts of short-term workarounds they had long used to enable the ongoing design of components and systems. In short, they did what they knew, and what they had to, to get product out the door.

This brings us to our third transition. Why did TIER1 engineers reveal that they could not fully explain why the system had succeeded on the Euro NCAP test, given that the situation was not intrinsically a "problem" for all parties and that established and established recurrent practice was potentially a feasible solution? The "debriefing" did create a problematic situation for TIER1 engineers. They had to say *something*. Still, scores of interviews at both Fiat and suppliers have made it clear that Fiat's heavy turn towards outsourcing and ensuing downsizing of its technical staff had left enough gaps in the company's technical expertise that they might easily have maintained the status quo, had they so chosen (see especially Whitford and Zirpoli 2011; Zirpoli and Becker 2011b; Zirpoli and Becker 2011a). Their decision to act otherwise thus requires explanation.

We maintain that an adequate explanation must make sense of the ways in which a kernel of collaborating engineers -- working across organizational boundaries -- were able to permanently alter recurrent practice beyond just their own bailiwick. Our interview material, seen through a pragmatist lens, offers such an explanation. We have all the pieces for a story in which TIER1 engineers were frustrated by the failure of valuations previously made, felt they had exhausted the available means to their chosen-ends-in-view, and thus elected -- borrowing Orlikowski's (2000: 423) words -- to consider "changing their ends." The idea that actors select not just the best means to a given ends, but that they might also propose alternative ends(-in-view) as their response to problems is a characteristic feature of a Deweyan pragmatist theory of action. And while we recognize that many sociologists may see this as a dangerous proposition since it might be misunderstood to mean that pragmatists promulgate a sort of "free-floating" conception of agency in which anything can happen at any time, we think this a misplaced worry. That is not how proposition of this sort were understood by Dewey or by those who have followed him in their theorizing (see e.g. Whitford 2002; Joas 1993; Joas 1996; Kilpinen 2003). The empirical creativity of action is no bug, even for the social scientist who would like to understand. It is a feature.

A pragmatism and practice approach requires the theorist first to situate actors in time and in social space and document the means available to them. But, so that the theory of agency is not free-floating, the theorist should be aware that actors' do not posit ends-in-view willy-nilly. Means -- the possible solutions when "customs fail to give required guidance" (Dewey and Tufts 1932: 197) -- are themselves in the situation. It is their use, their mobilization, their invocation that is creative. In our own case, we hope we have (1) already situated our actors in the narrative to this point; and (2) that our descriptions of the artifacts, techniques and relations used across the three transitions have documented the sorts of means those actors used to govern their efforts to jointly design and produce passive safety systems for automobiles. We have, however, so far framed those means as alternatives to the *same* end-in-view, in the sense that we have described them as alternatives by which Fiat and TIER1 might over time, smoothly design and produce a safety system in which TIER1 maintained responsibility for its overall performance. We hinted in our discussion of the third transition that techniques and relations were salient in the companies' decision to reconfigure roles and responsibilities, but argued that the approaches that conventionally invoke those techniques and relations in their explanations could not tell us why they were invoked -- or how they were invoked -- in that reconfiguration. And it at this point in the argument, finally, that the full value-added of incorporating a pragmatist actor into a relatively standard practice approach comes clear.

Pragmatism lends insight as to why a successful test might lead Fiat and TIER1 to reconfigure their roles and responsibilities. Success on the test had been "serendipitous" (our translation of the Italian term used by a TIER1 engineer) -- and was used serendipitously (creatively) by TIER1 engineers. They hypothesized an alternative line of action using existing means, but to an alternative ends-in-view. They recognized that their growing sense that it had been a mistake to turn towards black box sourcing was at odds not just with the positions taken by their respective company leaderships who had not -- like them -- seen that efforts to standardize interfaces and the RASI had not proved

effective. They had been drawing on their close ties to operational personnel at Fiat in efforts to find workaround to the many coordination problems that would arise (lest they be blamed for those failures). They knew from those relations that there was a sense internal to Fiat that something was strategically amiss. A combination of falling sales and consistent overruns and delays in projects had left Fiat on the edge of bankruptcy in 2004, and had created some turnover in Fiat's technical and strategic leadership. The occasion of a serendipitously successful test, in this context, allowed TIER1 engineers to mobilize those relations and to push for a reconfiguration of roles that would leave TIER1 engineers in charge of component design but free them from responsibility for overall system performance.

To be clear, those engineers' decision to reveal their ignorance to their operational counterparts at Fiat was a gamble. It was a hypothesis, a trying out of courses of action no less than was the decision by those higher-up to turn towards black-box sourcing some years previous. It might not have worked, and some newly problematic situation would have occasioned some alternative solution. In the particular case, they hoped that their counterparts at Fiat engineers might in turn use that test as an occasion to mobilize "upstairs" and to endeavor to convince their own superiors to abandon the company's strong turn towards "black-box sourcing." Their hopes, in empirical fact, were ultimately fulfilled for safety system design. And, in a story that to tell properly would unfortunately take us well beyond the scope of our narrative here, that fulfillment contributed to a broader mobilization across the production network. A series of events, ranging from the crash test, to a successful redesign of a dash module, and beyond -- all in response to problems engendered by modularity -- generated enough resistance and mobilization for some change in practice that that high level managers who had once spoken of the obvious advantage of modularity sang a strikingly different tune when re-interviewed in 2006.

One such manager, who had had been in the company's technical direction both before and after the crisis offered an especially striking comment. He told us that it had in retrospect been "naïve to believe you can integrate a system without holding an in depth and detailed knowledge of the components that are going to affect the performance of the whole car." What had once been obvious was now naïve. And what had once been naïve was now obvious.

IV. Conclusion

In this article, we have sought to contribute to the "practice turn" in organizational sociology, and have done so by showing how a pragmatist action theory allows theorists to engage "with 'how' practice emerges in real-time rather than [with] 'what' practices are in use" (Simpson 2009: 1343). We began with a substantive question: How ought we best to understand how, when, and why organizations collaborate in the design and making of the things they design and make? We then used our study of transitions in the relationship between Fiat and TIER1 to show that the question was -- and,

simultaneously, was not -- well answered by the three classes of theory that currently dominate the literature on inter-organizational relations. We showed that the modularity and learning by monitoring perspectives respectively provided powerful explanations for specific transitions. However, their proponents hold these theories to be alternative *general* explanations (Sabel and Zeitlin 2004; Langlois 2004). Viewed in that light, the evidence at first seemed to show that the learning by monitoring perspective suits the empirical context of the automotive industry much better than does modularity. However, we then showed that reference to embeddedness -- ostensibly an alternative -- was required if we were to explain why TIER1 was able to convince Fiat to reconfigure roles and responsibilities in light of a successful crash test.

We have used this piecemeal story, in which different approaches seem to apply at different times, to show that scholars would do well to pay more attention to the role that human agency can and does play in the dynamic evolution of the production networks that now dominate so many industries, including especially the automotive industry. In particular, we argued that attention to practice, combined with a pragmatist understanding of action, allows us to examine the dominant approaches not from outside the case, but rather from inside. We have noted that the sorts of causal dynamics identified in common organizational theories are often not just known to the actors, but are used by those actors as they postulate solutions -- means-to-ends-in-view -- that they hope will render problematic solutions determinate. Echoing Dewey's opposition to "spectator theories of knowledge," we have hence argued that the question of scope for the three approaches with which we are in dialogue -- the circumstances in which their hypotheses ought to hold true (Walker and Cohen 1985) -- are endogenous to the objects of analysis. That is, we have shown not just that organizational theory applies situationally, but that organizational theory, properly understood, can say something about the situations in which different theories are likely not just to apply but to be applied by those we observe.

The question that remains, of course, is why this finding *matters*. Or, to put that question in explicitly pragmatist terms, “what concrete difference will it being true make in anyone’s actual life” and “what experiences will be different from those which would obtain if the belief were false" (James 1907: 142). The answer, to our read, is twofold. First, we should note that the pragmatist approach to the study of organization that we have laid out here stands in marked contrast to its use in the writing of Charles Sabel, with whose theories we are in dialogue here. Sabel (2006, emphasis added) describes the techniques of learning by monitoring as "*pragmatist* in the sense of the philosophy of Peirce, James and Dewey: they systematically provoke doubt, in the characteristically pragmatist sense of the urgent suspicion that our routines -- our habits gone hard, into dogma -- are poor guides to current problems." And he argues that those routines generate a type of "deliberately innovative organization" that is also "pragmatist" and that can be contrasted to the classical Weberian-Simonian-Chandlerian-Williamsonian hierarchy (see also Helper, MacDuffie and Sabel 2000; Gilson, Sabel and Scott 2009).

From our perspective, it makes little sense to describe one routine or one type of organization as more or less "pragmatist" than another. Pragmatism, as we intend it here, is a means by which to link theory and practice. To describe something observed in practice as more pragmatic than something else reifies, which, as we understand it, is not

pragmatist. We say this, to be clear, not to frame our contribution as one that sits on the right side of a duel between pragmatists. We want rather to the utility, to paraphrase Feldman and Orlkowski (2011) of going beyond just theorizing pragmatism. We have sought also to practice it in this article by taking care to distinguish between our theory and our metatheory -- as is characteristic of a Deweyan pragmatist approach.

We do recognize that Sabel and collaborators' purpose in labeling of the techniques he is identifying as pragmatist is to underscore that the growing significance of those techniques had been obscured by a dominant theoretical framework that had demanded greater fixity of routine than we generally see in the world of organizations today. And it is to suggest that they are the sorts of techniques that a partisan of pragmatist mode of theorizing might conclude best in light of a study of organizing today. The term is in a sense a shorthand. But it is shorthand that misleads. The techniques of learning by monitoring were clearly in use at both TIER and at Fiat and did serve not just to reorder routines but even generated a moment that TIER1 engineers could use to provoke some useful doubt. Yet they were but one of a series of means available to the actors in our story, and were in fact thrown over for -- or at least combined with -- some recourse to the interpersonal when the time came. It is not the techniques that are pragmatist. What is pragmatist is this case is the tool that the analyst -- in this case us -- uses to understand how the relationship between TIER1 and Fiat could have evolved as it did.

This brings us to our second fold. What does a pragmatism and practice approach have to say about the question with which we opened the article? How ought we to understand how, when, and why organizations collaborate in the design and making of the things they design and make? We have refused to answer the question in general terms, and have argued simply that it depends. This may frustrate some readers, since everything depends. That, nonetheless, is the negative lesson of our case. But there is a positive lesson as well. A pragmatist and practice approach dose more simply than reframe the boundaries of the firm debate as a debate about theoretical scope. By rejecting spectator theories of knowledge and bringing the creativity and intelligence of those we -- as scholars -- analyze into the story, it provides us also a means to assess when and why different approaches to organization are most likely to explain not just the present state of relations within and between organizations, but also those that might most likely obtain going forward.

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