

WHAT *TALKING* TELLS US

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Orr's work falls on one side of a marked divide separating rule-based theories from practice-focussed research. From within the tradition of workplace studies (which show themselves intermittently susceptible to rule-based assumptions), Orr argues that workplace studies failed to see the sort of improvisation and *bricolage* central to his analysis for want of looking. I claim, by contrast, that it was more for want of seeing. Early workplace studies could barely conceive of workplace autonomy or improvisation as anything but counterproductive. By attacking an implicit theoretical demarcation between mental and manual labour implicit in this presupposition, Orr's analysis presents both management and theorists with the surprisingly uncomfortable challenge of the knowledgeable worker. A brief analysis of the EUREKA project's support of workplace learning suggests how Orr's work challenged and still challenges more complacent view of knowledge in organization and "knowledge management".

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Organizational research today can seem little more than management research, so this celebration of *Talking About Machines*, Julian Orr's investigation of work practice, is a tribute not only to Orr but also to *Organization Studies*. Beyond acknowledging my debts to Orr, I offer a context for *Talking*, both organizational (within Xerox) and theoretical (within workplace studies). For the first, Orr's work, which had a decade long gestation, fell on one side of a marked divide within Xerox's Palo Alto Research Center (PARC) during that period. This roughly divided separated computer scientists from social scientists. One side assumed a rule-based view of the workplace. This conveniently rendered work itself susceptible to the techniques of artificial intelligence (AI). The rule-based view drew serious critique from students of situated practice on the other side of the divide. Rapprochement between the two was not unknown, but not common. In the second place, Orr's work falls within the tradition of workplace studies (which also showed themselves intermittently susceptible to rule-based assumptions). Orr suggests that workplace studies failed to see the sort of improvisation and *bricolage* central to his analysis for want of looking. I claim, by contrast, that it was more for want of seeing. Using Roy's work as an example, I suggest that early workplace studies could barely conceive of workplace autonomy or improvisation as anything but counterproductive. By attacking an implicit theoretical demarcation between mental and manual labour implicit in this presupposition, Orr's work presents both management and theorists with the surprisingly uncomfortable challenge of the knowledgeable worker. The implication that neither workers nor organizations could be reduced to rule-driven systems eventually bridged the divide within PARC and contributed, not necessarily through direct collaboration, to the EUREKA project, whose gestation (almost as long as that of *Talking*) shows how Orr's work challenged and still challenges more complacent view of knowledge in organization and "knowledge management".

Plans and documents

Learning was one point of confrontation between the two sides at PARC.² Xerox at the time was producing more sophisticated photocopiers and, in proportion, more baffled users. AI's promise to manage user-machine interactions offered solutions for people using the machines and for technicians fixing them. For both, if AI worked as promised, relatively simple instructions would replace the need for understanding.³ That promise underwent severe critique from Suchman (1987), who addresses the problem from the user's perspective, and from Orr, who addresses the technician's perspective.

Suchman focusses directly on AI. Orr is more indirect, working on the contrast between the technicians' practice (Orr, 1986) and the behaviour assumed by "directive documentation" (Orr, 1990b, 1991, 1996a). Ideas of directive documentation misunderstand how both people and documents work. People are assumed to follow rules and so, by extension, organizations are taken to be rule-based systems, managers rule givers, and nonmanagerial workers rule followers. Similarly, documents, whether paper or digital, are assumed to prescribe rules that can replace misbegotten muddles in people's heads. Such notions date back to Taylor, hence directive documentation "belongs in the scientific management tradition" (Orr 1996a: 107). In practice, Orr reveals, work looks very different.

Neither Orr nor Suchman dismisses plans or documents. Both see these as important tools, but both suggest that on their own documents require situated interpretation that is not itself rule-based. Document users are not galley slaves, pulling obediently in a predictable and prescribable direction. The idea that documents dictate practice independent of situated interpretation has a long history and (and modern acolytes). It was reflected in the RAPPER project at PARC, which sought to provide a rule-based expert system to guide technicians through diagnostic work (Bell et al, 1991).⁴ Orr shows that such rules are never of themselves complete and sufficient. The most difficult but also most important tasks technicians faced were unpredicted. Consequently, they could not be anticipated in prescriptive documents. Improvisation and in situ learning negotiate between the two.

Orr's antecedents

Where Suchman, reflecting ethnomethodological influences (Garfinkel, Sacks, and Schegloff are among her most cited authors), sees the gap between plans and actions as necessary, Orr, drawing more on classical anthropological roots (Evans-Pritchard, Geertz, and Levi-Strauss are among his), divines the gap from observation. The technicians he studied had multiple documents to guide their work. The work got done. But you couldn't explain how the work was done from the documents alone. So where RAPPER focussed primarily on difficulties that machines had. Orr, by contrast, focusses on the technicians, their difficulties, and how they solved them. Anthropological roots aside, Orr's work comes in a tradition of organizational studies championed by van Maanen and Barley (1984). They claim "Organization theory has very little to say about the things people actually do at work (1984: 350). The opening page of *Talking* echoes this: "professional literature on work ... is not concerned with work as practice, by which I mean that these writings do not focus on what is actually done in accomplishing a given job" (1996a: 1) and the book responds to van Maanen and Barley's plea for better analysis of work and "occupational communities".⁵ Unlike Barley, however, Orr's close attention to practice often pushes the organization to the periphery. With the technicians, for whom "the organization rarely appears in [their] stories" and is "largely irrelevant to [their] actual work" (1996a: 143), Orr avoids institutional questions.

Attending to work, Orr exposes issues invisible from an institutional or managerial perspective. Where Xerox managers assumed technicians worked individually, Orr shows they relied on collective resources, thus creating an "inherent tension" between the collective approach and "the assignment of individual responsibility" (1996a: 64). Where managers saw work as conducted on company time, Orr shows how much occurred outside the working day, as technicians met regularly and talked incessantly. His first "vignette" of work describes a breakfast meeting of technicians (1996a: 15-19). And while corporate training and documentation were assumed to provide adequate resources, Orr shows that only on-the-job learning prepared technicians for the unpredictable failings they encountered. An informant told him that new technicians learn "enough in the school to survive their first few calls, long enough to see how the machines behave in the real world" (1996a: 50). Then community-supported learning begins and technicians, more interested in fathoming machines than what talking tells us

following rules, proceed by collaboration, improvisation, and *bricolage* (1991: 1). These, he notes, "are part of learning" (1996a: 12); "collectively, [the technicians] are continually learning" (1991, 16) and new insight generated is "shared through the community" (1996a: 102).

Connecting individual and community, improvisation and learning, Orr was himself generating new insight. van Maanen, Barley, and Orr suggest the general failure to study work directly made learning invisible. I suspect that it was not for want of looking so much as for want of seeing. The Hawthorne experiments (Mayo, 1933, Roethlisberger & Dickson, 1939), after all, spawned innumerable studies of work places and groups. The 1950s abounds with "small group studies" of the "informal group" in the workplace.⁶ Unlike Orr's work, however, these assume as much as discover that improvisation is unwarranted and, organizationally, detrimental. A rule-based view prevails with the organization as a "planned system of cooperative effort in which each participant has a recognized role to play and duties or tasks to perform" (Simon et al., 1962: 5). In Scott's neat summary, "Human behavior disrupts the best laid organizational plans and thwarts the cleanness of the logical relationships found in the structure" (Scott, 1951: 12). An early attempt to assimilate Shannon and Weaver to organization studies (Dorsey, 1957) classifies unanticipated activity of the sort Orr validated as "noise" to be filtered out.

Unlike Orr, however, I am doubtful that participant-observation was alone sufficient to turn this noise into signal. The problem was as much theoretical as methodological. Donald Roy, a "master ethnographer" in Burroway's (2001) appraisal, produced studies that resemble Orr's and still merit reading. These record "what people do" and the "informal intergroup connections that bear directly on work behavior". Rebutting Mayo, Roy (1954) grants his subjects (and co-workers) rationality that earlier studies deny. But for all Roy's sympathies, this is a destructive rationality serving the interests of neither worker nor organization. His conclusion reflects how deeply Willis's (1977) mental/manual division of labour is entrenched in organizational analysis. Veblen traces this division to feudalism. The nineteenth century naturalized it in the language of factory "hands" that work and "heads" that thought. Twentieth-century organizational sociology helped keep it alive. Roy accommodates this almost-feudal distance between himself and his informants, archly "joining offended readers in the hope that someday our

industrial workers will achieve a level or refinement in thought and action that their behavior will be no more distressing to us than that of the college students" (1961: 166n). So for Roy, unlike Orr, shopfloor "talking and fooling" are deprecated (1961: 156) and learning excluded. He occasionally approaches Orr's (and Adam Smith's) point that workers know best how their work might be done, quoting one informant saying that "You can't 'make out' if you do things the way management want them done" (Roy, 1954: 257). ("Making out" is the shopfloor term for meeting production targets.) Roy neglects the force of that insight, though Burrawoy picks it up, arguing that in "not giving [workers] genuine voice in the factory order, managers simply did not comprehend their own best interest", (2001: 455). So doing, Burrawoy comes closer to accepting a critical implication of Orr's work: in certain circumstances workers may know more than managers about what is good for the company.

Orr's alternatives

Suggesting that the insight and creativity of the technicians might be organizationally valuable, Orr raises three points that deserve emphasis.

- (a) workers produce knowledge in their work practice
- (b) that knowledge may be valuable to the organization but contrary to its rules, thus in certain cases, by disobeying rules, employees may save the company from itself
- (c) employees may hide this knowledge from managers

The first of these now seems incontrovertible; the second remains controversial (Contu & Willmott, 2003). Of course, all knowledge so produced will not be organizationally valuable. Much will be neutral, and some organizationally damaging. But deviant and recalcitrant aspects of workplace improvisation have surely had sufficient emphasis in the past century of organizational study that they need little more attention. More intriguing because less noticed, some learning through work practice may, as Burrawoy suggests, be organizationally insightful, saving a company from its own blindness. In Orr's case, if the technicians had abandoned diagnosis when the directive documentation did and followed the catch-all rule, which was to replace the machine, they would have drained Xerox of customers and credit. Instead, going off the map, they found routes that satisfied their own quest for a solution and overcame limitations arising from the corporation's view of work. van Maanen and Barley note that "what is deviant

organizationally may be occupationally correct" (1984: 291). By extension, what is occupationally correct may in some circumstances also be good for the organization, though neither the management nor the employees necessarily expects this.⁷

Such practice-created insights are hard for management to accept for a number of reasons. First, management has not been conditioned to expect nor is it usually willing to concede that knowledge arises from below. As Orr puts it, "by not seeing what is actually done, the corporation may continue to claim the supremacy of their concept of repair work in spite of the experience of those in the field" (1991: 17).⁸ Second, as they are held accountable to the rules, employees tend to report their own work practices in accordance with those rules, even if the rules don't work. And third, employees have little reason to trust management with their knowledge as it may be used against them. A PARC researchers on the EUREKA project found, "when first asked, the [technicians] all said they followed the manual religiously, but when they found out that the PARC researcher was not from management, they shared their notes on their own clever solutions" (Bobrow & Whalen, 2002: 50). Orr notes that "technicians have reason to be wary of the corporation" (Orr & Crowfoot, 1992) in particular because employee-developed efficiencies may be used to lay off employees. Roy's work group were hesitant about "making out" too often because the quota target by which they were assessed would be raised. Knowledge is thus regularly concealed.

Not only managers, but also management scholars resist the idea that valuable knowledge may percolate up rather than drip down. Mayo's (1933) Hawthorne studies make workers highly irrational. Roy (1952) counters that claim, arguing workers made economically astute calculations, but concludes these calculations inevitably counter the organization's interests. Worker-generated knowledge can thus only be organizationally harmful. There is an overly neat division here. Employees are, by such accounts either stupid or destructive. Take either position and you can justify draconian management practices. Orr muddies this Manichean neatness by showing that workers in pursuing their own interests (in the technicians' case their interest in how machines work) may help the company achieve its goals. If that is the case, however, management needs to cede a certain autonomy to these workers. Inevitably, such concessions make most management uneasy.

Unease about workplace knowledge comes from other directions, too. Whyte (1987) reports that when he suggested the possibility of communication between management and workers, labour sociologists accused him of attempting to coopt the workers. Contu and Willmott (2001) make similar charges about Brown & Duguid's (1991) "structural-functionalist" analysis.⁹ Again we face a Manichean choice. Either we insist that such knowledge is inevitably inimical to organizations and employees are unmistakably an "adversarial group" (Roy, 1953: 411). Or we suggest it is no more than the reflection of the technicians' structural location in capitalist society and so ripe for exploitation. The situation is neither analytically nor practically so clear cut. Knowledge is produced from below in organizations, some of which, whatever the reason for its production, may be organizationally useful. Such knowledge presents organizations with a dilemma, whether to respond to this sort of innovation (and grant the autonomy it entails) or to repress it. If they seek to support the knowledge, organizations face the problem that organizationally advantageous knowledge is not necessarily divisible from knowledge that challenges organizational authority.

Topographies of knowledge

Researchers from the other side of the PARC divide noted above took up the challenge of supporting the technicians. Their approach represented a significant shift for people who had previously sought to model copiers and regiment practice. The project developed by parsing the problem into a variety of levels that suggest topographies of knowledge. At the level of the local community that Orr studied, there was no great need for extensive technological support. Members of this group worked closely, saw each other frequently, and circulated knowledge effectively. But they were a tiny part of more than 20,000 Xerox technicians worldwide. Supporting this community was a significant challenge, met by working at two further levels and in multiple stages.

The next level involved the "Denver Project" (Orr, 1992, Orr & Crowfoot, 1992). The task was to support technicians whose region covered thousands of square miles and so for whom casual meetings were not an option. The project began from the premise that "service technicians are important, skilled, and knowledgeable" (Orr & Crowfoot, 1992: 2), a major advance within the corporation. The project provided two-way radios

for the group to coordinate work practice. This was, by the technicians' own testimony "a great success ... greatly chang[ing] work practice" (Orr & Crowfoot, 1992: 15). Two non-technical issues presented a particular challenge here. Both concerned trust. First, for the sorts of noncanonical communication the project was intended to support, management had to be kept out of the technicians' open channels of communication and technicians had to be confident that management was out. Second, technicians had to be persuaded to join a project that, if successful, had potential to reduce the number of technicians needed. Both issues were central, both had to be negotiated, and neither admitted of an irreversible fix. Explicit management commitments, somewhat paradoxically, resolved both.¹⁰

The third level sought to extend such trust-based knowledge circulation to support technicians geographically dispersed and, eventually, divided by language, and culture. In pursuit of this goal, members of the RAPPER project no longer sought to tell technicians how machines worked, but to build technological tools "responsive to users, in contrast to the more common practice that uses new technology to hold people rigidly accountable to following reengineered processes" (Bell et al., 1997: 261). Launching, COLUMBUS, the initial project, in France, designers began with a small group and scaled up slowly and deliberately. They sought to build a system in which the sorts of tips that Orr had heard passed around could circulate electronically.¹¹ For this, developers and technicians made three critical decisions. To engender the necessary trust, they sought a technician-driven not a management-driven system; to screen for accuracy and redundancy and so keep the system lean and the tips useful, they developed a mechanism of validation (in essence a peer review); and to resist perverse incentives, they rejected a financial reward for tips, preferring these should be labelled with the name of the submitter, which further helped build trust as well as reputation. In 1996, the group began the EUREKA project in Canada, seeking to build on French successes, albeit with a different technological platform.¹² In 1997, the project moved on to the United States and finally went world wide in 2001 (Bobrow & Whalen, 2002). By this time, both managers and technicians thought the project highly successful.

This success took a dozen years to develop. It involved both slow, careful, and iterative development and a major shift to a commitment that, in keeping with Orr's insights, determined to honour the technicians, their knowledge and their values. It

struggled both to gain and protect technician's trust, a critical issue throughout this story. As Orr had argued from the beginning, it would be "only when technicians are as comfortable in the electronic hallways as those of the branch office that they will tell the same stories there" (Orr, 1986, p. 11). Knowledge, as Eckert (1989) argues and this work shows, can circulate with remarkable ease within trusted peer groups. Between competitive groups, however, it becomes a token to be bargained tactically, rather than circulated openly.¹³ Organizational hierarchies, embracing unequal groups demand constant bargaining. Knowledge is one way in which employees at all levels negotiate relations with those above and below. Yet people seem more willing to understand why managers will not share what they know than why employees will not. In trying to understand when and where knowledge moves in organizations, it is important first to recognize where that knowledge arises, and then to distinguish conditions that dictate whether people can or can't share ideas, from those that determine whether they will or will not share them. The EUREKA system dealt with both.

So what does *Talking* tell us?

Orr clung close to his empirical fieldwork and, though he paused once in a while (Orr 1993, 1995) to criticize organizational studies, he resisted broader generalization. His findings do, however, raise more general issues.

First, in challenging binary divisions between mental and manual labour, Orr's work suggests that organizations are, internally, finely divided. As practice produces knowledge, the division of labour segments organizations around divisions of knowledge (Brown & Duguid, 2001). Orr's organization resembles Babel, with groups who, while they must work with each other, can't quite understand each other. Technicians are misunderstood by management, which can be contemptuous when it thinks technicians don't have useful knowledge, and then acquisitive when it discovers they do. Technicians are at odds with the engineers who design machines; with the training force, who prepare them for their work; and with the sales force, who sell the machines, based in part on recommendations from technicians.¹⁴ To suggest that organizations are "communities of communities" (Brown & Duguid, 1991) does not entail that organizations are cosily consensual.¹⁵ Rather it suggests that they are not aggregates of individuals united in a

corporate culture but composites of numerous communities of practice whose differences created myriad--and from an individualist perspective invisible--internal divisions.

Second, given these divisions, knowledge sharing is always problematic. The division of labour/practice creates epistemic divisions, making understanding across gaps in practice, difficult. Constructed within hierarchical, competitive organizations, such divisions also make knowledge sharing tendentious. Different kinds of barriers to sharing help indicate the depths of problems to be overcome and shape possible circuits. Yet, what Hargadon and Bechky (2005) call the "micropolitical dynamics of knowledge work" are too readily glossed over in discussions of "translating" or "explicating" local knowledge (Nonaka & Takeuchi, 1994; Cowan et al., 2000).

Third, as knowledge created for community purposes may be useful for organizational goals, while knowledge created for organizational goals may be dysfunctional for the workings of a community, implicit belief in a rigid category of "useful knowledge" is also misconceived. Organizations can't simply hope to solicit or extract the good and suppress the bad. What is good or bad is heavily situated and thus indivisible. Supporting productive activity requires significant care and concessions to autonomous work practice. Knowledge in organizations is dynamic, its creation continuous (Cook & Brown, 1999). Attempts to reify the "useful" or anathematize the deviant will not only fail to reflect this dynamism, but if it is seen as exploitative, inhibit future circulation.

Fourth, the image of the rational organization which not only prescribes goals, but also the means by which they are to be achieved is once again challenged. Nevertheless, no-one having yet got a stake through its heart, the idea remains remarkably resilient. When it walks at night, it tends to invade unknowing hosts. Hence the organizational landscape abounds in programmatic communities of practice and top-down EUREKAs. In 1987, Whyte wrote, "In the past, designers of organizations laid out the technology and assumed that work and social processes must be designed ... to fit the requirements of the technology" (Whyte, 1987: 495). In the era of Business Process Reengineering, Enterprise Resource Planning, and Knowledge Management perhaps the most contentious part of Whyte's claim is the opening phrase "in the past". As Orlikowski and Barley (2001) argue, we still have to deal with rational accounts of technology and the

organization that ignore the dynamism of human practice and portray human agency as recalcitrant or deviant behaviour needing to be tamed. Attempts to understand organizations from a managerial perspective alone reflect similar assumptions. By taking us outside that perspective, Orr's work has helped undo such easy certainties. Finally, then, *Talking* tells us that, as for documents, so for organizations, the key word is not *directive*.

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- 1 I am grateful to Hardimos Tsoukas for the invitation to participate in this celebration, and to Danny Bobrow, John Seely Brown, and Yuri Takhteyev for generous readings of earlier drafts of this paper.
- 2 In 1987, Xerox supported the Institute for Research on Learning, which brought together PARC researchers such as John Seely Brown and Lucy Suchman as well as Orr with learning researchers, including Jean Lave and Etienne Wenger.
- 3 These strategies, particularly the one dealing with the technicians, bore heavily on discussions of "deskilling" that were current at the time. Orr argues that, though management pursued deskilling strategy, it failed (1996a).
- 4 Technicians had different kinds of computer-based document systems already. These appear to have been designed more for managing and monitoring work than for supporting it (Orr, 1986).
- 5 In his introduction to *Talking*, Barley argues that Orr, "puts the flesh of everyday life on Lave and Wenger's idea of a community of practice" (1996: xiii). But Orr shows little interest in the concept. When he talks of a community of practitioners (1991: 3), he cites van Maanen and Barley. When he talks of a community of practice (1991: 3), he cites Jordan. When he cites Lave (1996a: 123n), it is by way of a conversation with Suchman and nothing to do with the "community of practice".
- 6 See, for example, *American Sociology Review* 19(6) 1954.
- 7 Orr stresses that the technicians are pursuing their own interest in machines more than the goals of the company.
- 8 Orr notes how the technicians need to save face. This denial of knowledge from below may be a case where management (and management theorists?) are also looking to save face.
- 9 Academics need to be cautious about deprecating the generation of knowledge in practice as if, somehow, knowledge produced by employees in capitalist organizations was inherently debased. After all, academics themselves produce knowledge in capitalist organizations. To value the knowledge they produce (as most academics do), while dismissing what others produce as no more than the "hegemonic, consensual alignment of views" (Contu & Willmott, 2003: 290) is at best unreflective.
- 10 Though it may have had no bearing on this project, Xerox addressed such issues in earlier research projects. See Lazes & Constanza (1983).
- 11 Bobrow (personal communication, April 6, 2006) suggests that the EUREKA work came out of the tradition of participatory design, and while it was compatible with Orr's work, it was not derivative.
- 12 Because the Canadians had a financial incentive system for tips, EUREKA honoured it. The old system, however, rewarded submissions. With EUREKA, rewards accrued for accepted tips only.
- 13 At the beginning of the COLUMBUS project, for instance, technicians worried about surrendering insights that gave them an advantage in benchmark comparisons between groups of technicians (Bobrow & Whalen, 2001). Though he fails to cite her in *Talking About Machines*, in earlier essays, Orr (1990, 1993) cites Eckert, whose insights into the social and particularly the class-based constraints on the circulation of knowledge had a profound influence at IRL.
- 14 For a view of the sales force, see Østerlund (1996). Østerlund's work was carried out under Orr's guidance and extends many of the latter's insights, incorporating, in particular Lave's and Lave & Wenger's work.
- 15 Equally, it was not the intention to claim that communities of practice were internally consensual. As Brown & Duguid (1996) claimed, they provided less sites for agreement than "grounds for a fight". One of the most important and overlooked aspects of Lave & Wenger's (1991) notion was that communities of practice were driven by internal tensions of "continuity and displacement".