

Discursively Structured Activities

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Talk helps organize the activities it is part of; people maintain regularity of activity through the typification of talk. Similarly, the recognizable similarity among written texts (i.e., recognition of genre) helps maintain social and cognitive structure within activities producing or using those genres. Enduring written texts and systems of texts provide a conservative, reproductive force on local activities. Events are particularly held accountable with those texts that count as knowledge, and thus knowledge-bearing texts are influential in the organization of daily life. Further, disciplines concerned with the production of knowledge represented in textual form develop their structures of social and intellectual practice in dialectic with the textual forms by which knowledge is created and circulated. An examination of the discursive organization of the fields of knowledge production gives us tools for examining the roles knowledge serves within modern culture and opens up questions of how society is organized and how power is distributed around the knowledges we produce.

Most human activities that engage more than a single person have a strong communicative element. Even shared carrying of a rock is enabled by standard verbal procedures to coordinate the timing of the lift—"ready, ok, 1, 2, 3, lift"—along with the height and position of the lift, the positioning of grasp, the speed and direction of carrying, and so on. The typification of the verbal procedures and the distribution of verbal tasks—such as who will have a say in setting directions and establishing timing—help organize the activity and the social relations of the several participants.

The more prominent the communicative actions are in the activity, the more the organization of the communication will influence the organization and nature of the activity and the social relations enacted in pursuit of the activity. The airline pilot's checklist before takeoff structures talk with the copilot, navigator, and ground crew; enacts directives from the legal and regulating bodies overseeing flight; establishes a record of actions taken by the flight crew; and provides a task-oriented frame for interpreting other recordings of conversation and instrument readings. Further, the checklist regularizes and structures the procedures of the takeoff, the perception and inspection of instruments and the physical environment, and the manipulation of the aircraft and its controls. In so doing, it allocates those material tasks to people occupying different social roles. This activity-organizing checklist and the procedures surrounding it are, in turn, the residue of a complex history of material inventions of aircraft and instruments, informal ad hoc procedures and formal instructions, pilot training, government regulation, accidents and their investigation, and a thousand other things—but that being said, the checklist now serves to organize and regulate the now highly structured activity.

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In cases where the task is to produce discourse, such as the production of a court record to make inspectable and accountable the various actions occurring in the court to support the decisions made in that proceeding, the procedural and formal organization by which the discourse comes into being both shapes the final discursive product and frames the participation of each person in the court (Engeström, 1992, 1996; Stratman, 1994). Indeed we can go even further in saying that the activity of the court (and not just its subordinate actions) is to produce a discursive object—the verdict or judgment. The object of producing a verdict to be uttered by the jury and recorded in various documents, then, is elaborated through the many highly structured discursive activities, roles, and genres that give familiar, recognizable, and regulatable shape to typical court events and that constrain and direct discourse occurring in and around the courtroom.

The various disciplines concerned with the production of knowledge largely produce discourse, most often written discourse: an article, a book, an equation, a set of statistical correlations. The structure of those texts that are the object of those activities and the goal of many of the supporting actions, and the structure of the procedures by which the main and supporting discourses are produced, then shape the entire field of activity, including the relations and interactions among participants (Bazerman, 1988; Russell, 1995, in press).

Because the produced discursive objects are in a sense concrete, although symbolic—an actual utterance, a physical book, an interactive computer program that can be run repeatedly on a computer—they provide a concrete locus for the enactment of social structure. That is, whatever individuals may feel and think about each other, however they may sense they relate to each other, whatever beliefs they hold about social hierarchy and obligations, however they may perceive social pressure and power, there is still an observable, recordable, collectable utterance that concretely mediates among these various personal orientations. One person (known as an author) writes a text and mails it to a person (known as an editor) responsible for gathering texts together in a journal. The editor, needing to make a decision about whether to publish the article, sends it to another person (known as a referee) who evaluates and reviews it, and so on. The actual production and circulation of the discursive object of a written text provides a common site of attention for the different actions and activities each enacts with respect to the text, shaping the role and relationships of the various participants and orienting their individual perceptions and cognitions.

We might here even note that interdisciplinary journals (with authors and subscription lists that cross many boundaries within the academy and professional worlds) such as this one, *Mind, Culture, and Activity*, are themselves the locus of the network of communication that establishes the common interest and activity of producing mutually interesting texts to advance us on our several loosely related projects. Although some of the people who read and write for this journal also participate in other related social locations (such as the Laboratory for Comparative Human Cognition, geographically centralized at the University of California at San Diego; the cyberspace discussion of the electronic list XMCA; or special interest groups that meet at several annual professional conferences), each of these communicative forums has its own set of personnel and activities, with only partial overlap with those of the journal.

The fact that written and archived material (whether in print or on an electronic server) can travel to different groupings of people, over geographic distances, and over time, means that their structuring influence may be widespread and persistent. Consider the way in which a national constitution structures the actions in many legislatures, courtrooms, police interviews with suspects, accountants' meetings with clients, and employers' consideration of potential employees.

The structuring, which occurs at many different times in many different places, affects the very organization of the discourse in the local settings, such as the repetition of Miranda warnings and the structuring of interrogation procedures on a street corner in Sandusky, Ohio, so as to produce evidence of the sort usable within court settings, or as in the encounter between a sales clerk and a customer in a San Francisco department store which must produce a recorded transaction that is accountable within the tax system, the corporation, the governmental systems that regulate the corporation, and the financial securities market with its own regulations. The humblest genres, such as sales receipts, have some relationship to the larger structuring texts of society—like tax laws, corporate records, financial reports for the securities markets, and economic indicators. Even friendships may be enacted through repetition of and responsiveness to the publically circulated discourses of entertainment, recreation, and personal and moral contemplation.

Local activity, always responsive to local conditions and the creativity of individuals bringing new and multiple resources to situations, can unfold in novel and unpredictable ways. Yet the improvisation is against social understandings of order, largely induced and enacted through discourse. Moreover, in the modern world most activities are deeply implicated with enduring written texts and systems of texts that provide a conservative, reproductive force on local activities. Every event becomes potentially accountable to a wide range of textual discourses against which the action is inspectable. Are the boss's comments consistent with state and federal law, the company's policies and mission statement, the union contract, the current year's business plan, good economic reasoning expressed in undergraduate textbooks, the current operating budget, demographic reports on the customer base, the moral teachings of her religion, current concerns being exercised through investigative newspaper stories, and last week's memo from the company personnel office?

Conversational analysis has made a similar claim that the fundamental mechanisms of social structure are to be found in discourse. Proceeding with methodological caution, however, they have stayed very close to observed data of local talk-in-interaction—that is, talk and gesture in real time of participants in immediate communication with each other (Boden & Zimmerman, 1991; Sacks, 1995). Thus conversational analysts typically consider recorded telephone conversations or videotaped face-to-face meetings. They identify phenomena that repeatedly appear at the microlevel in many specific conversations. As such the kinds of social structure they have been able to uncover are the structures of spoken dyadic interaction.

By studying writing, I have come at these issues of discourse and social structure from another direction. I have been examining more distant social relations enacted across space and time, often involving the circulation of documents to unknown multiple participants. The kinds of interaction between discourse and social structure I have noted have been concerned correspondingly with the larger regularities that organize and pervade local action, even as they are reconstructed by that local action. To make evident the kind of perspective I have been developing, I explore the issues of discourse and social structure as they have appeared in the highly structured but also highly creative discursive worlds of the sciences and technologies. I draw heavily on Vygotsky and Activity Theory, which provided me resources and perspectives to see these issues a bit differently than others in science studies. Underlying this discussion is my primary disciplinary commitment to the teaching of writing, which directs me to study the workings and consequences of writing in society.

By pursuing the discursive structuring of activity with particular reference to literacy practices in science and technology, I foreground the role of the construction, circulation, and use of texts

(writing, publishing, and reading) in all the activities of society and the ways in which textually fostered knowledge enters into the practices of daily life. That is, rather than subsuming my perspectives within general discussions of society and language, I want to move discussions about society and language closer to issues of literacy and knowledge within activities.

A useful problem in science studies is how to describe the regularities of the environments within which people participating in various scientific and technological projects act. Participants in scientific and technological endeavors notice, for example, the differences between talking in the lab and talking to a conference, between writing an article for *Nature* and writing an article for a methods journal in their specialty, between writing a major proposal for a specified program at the National Science Foundation and writing a proposal for a local seed grant. They notice the differences among talking to an instrument design engineer, a lab technician, a colleague in another field, a colleague in their own field, and the collaborator on their current project. And they use such knowledge to orient their behavior toward each other, toward the knowledge developed by others in other specialties, toward their own practices reflexively, and toward the task at hand. Explicit articulation of this knowledge is particularly useful and salient to students and others in transition between specialties, organizations, or roles.

At the level of social belief and people's behaviors on the basis of those beliefs, these distinctions are attended to as social facts. But the social facts go much deeper, not just as a matter of self-reinforcing prejudice: They are part of the self-constructing projects of each specialty that has historically constituted organizations, standards, journals, practices, and training. Although at one time the organized distinctions that structured scientific communities were in the forefront of science studies (e.g., Crane, 1972; Merton, 1973), in recent years these organized distinctions have been put on the back burner (e.g., Gilbert & Mulkey, 1984; Latour, 1987; Pickering, 1995). At most the structured organization of sciences and technologies have been treated as alliances of interests and power rather than as complexes of affiliation and coordination in the realization of the work activities of the specialties.

Nonetheless, just because the social facticity of disciplinary and specialty distinctions is easily observed does not make it easily described at the level of case or theory. Dangers of oversimplification and reification abound because disciplinary environments are only brought about and maintained by the reproductive actions of the participants, because the environments change, because the change is often brought about by the actions of the participants, and because the environments are assembled as part of and in pursuit of the activities directed by each of the participants (Giddens, 1984). Moreover, these environments are influenced by other activity systems around them (such as the press and its public, legislatures and their constituencies, religions, and activist organizations), the reifications and externalized consequences of their own previous activities (such as instrumentation; professional organizations; library catalog systems; journals and their boards of editors; and funding agencies with their procedures, regulations, and endowments), the reifications and externalized consequences of other activity systems (government regulations on research, the structure of modern universities and industrial laboratories, and the procedures and venues of government hearings), and the immediate material and semiotic consequences of their just-produced material and semiotic practices.

To clarify, the problem is one of describing the organization, structure, or order that exists within those activities identified as scientific and technological; the processes by which that order is created and maintained; the forces that influence the shape of that order; and the consequences of that order for the activity carried out within it. This problem is congruent with the classical problem

of describing social order and accounting for how this social order is possible; however, as we know more about social interaction the problem becomes harder to address, for we no longer find broad generalizations accurate.

Although early theories of science and society have framed out areas of inquiry, made visible a number of landmarks in the social landscape of science and technology, and provided some broad categories of considerations, they have been challenged by the far more detailed knowledge we have amassed by case studies. The broad generalizations of Mertonian sociology of science seem too sweeping and idealistic to stand up to the complexity of operations, relations, and behavior that we have observed, which seem to transgress the broad distinctions upon which the prior theory was built and belie optimistic hopes for what science might be.

These detailed case studies have made visible the complexities and dynamics of the production of knowledge; persuasion of publics; emergence of specialties; gaining of funding; defeat of opposition; resolution of controversies; drawing of boundaries; assertion of interests of all sorts; alliances among social, political, and scientific projects; and the creation of grand careers and technological juggernauts. These studies, however, have been driven by their own theories—theories of local construction and epistemological relativism—that help locate research problems, provide conceptual tools for defining and describing what is going on, and give a shape and impetus to the stories.

Theories are useful in that way, in that they provide an orienting framework that helps us know the world more intimately, that points us toward particular aspects and events of the world for us to investigate in detail, and that keeps us from getting disoriented in our increasing detail of account.¹ Theories are also useful in another way, in helping us as active social agents orient to novel situations, in helping reveal submerged aspects of our current situations, in providing guides for our actions. In short, theories are applied tools for reflection on our condition and possibilities.

Although constructivist and relativist theories encourage studies of difference, they also obscure what the differences are, for the differences have tended to be seen as local and contingent rather than ordered along any particular principles or processes. All scientific, technological, and social endeavors start looking much the same, with differences only in accidental details. The lingering effects of social stabilities get lost in tales of contingent stabilizations. Studies of localities tend to lose sight of the historical processes by which individuals and groups attempt to provide continuities among locales, attempt to draw together moments across time and space (as through organizations, training, institutions, forums, communication). Studies of localities also tend to lose sight of the stabilizing effects of artifacts that change only slowly (such as texts, dictionaries, linguistic resources, rock samples, museum collections, the earth and all that is contained within) and of reproductive processes and mechanisms (such as the printing press, education, social typification, imitation, economic integration). Such social and material continuities play an increasing role in modern differentiated society when we participate in many social networks that often extend over substantial distances and times (Luhmann, 1983, 1995). Only by such persistent continuities can we in fact recognize, orient toward, and act with some perception of what we are doing with respect to those multiple and distanced organizations. That professional societies exist, that they meet annually, that they have long-term membership, and that they have procedures for recruiting and selecting presentations all help the members gather, prepare talks, gain institutional funding,

¹There is a long tradition of considering theory as a heuristic, running at least from Priestley (1767) and Smith (1795/1980) through Lakatos (1978).

develop a frame of mind with respect to the meetings, and evoke motivations and agendas with respect to this particular set of social dramas.

Taking a longer historical view, we can see that people's activities are embedded within traditions of activities, texts, institutions, and organizations, which create some commonalities of experience and resources among those that share elements of that historical heritage. However, those commonalities are always seen from the position, motives, and personally constructed perspective of differentially located participants, whose differential location to some extent and in some ways can be seen as patterned also. The notion of social order and an organized environment for individual action makes a bit more sense if we take our lead from Luhmann (1989) in seeing society and social order not in the individuals or in the groups, but in what exists between the individuals and groups—that is, the communications and communicative systems.

So the problem is to find an account of the regularities by which we find the world to be to some degree ordered. One theory in science studies that has attempted this range of synthetic generality has been actant-network theory, which has evoked wide interest, has inspired substantial research, and has been extremely useful for investigating and accounting for many cases located across many kinds of research sites.²

Unlike earlier theories of scientific and technological structure, actant-network theory foregrounds individual agency, foregrounds an historical account of current arrangements, and foregrounds the creative response of individuals to complexity and contingency in order to create novel arrangements. In adopting such perspectives, however, actant-network theory places the individual actor at the center, with the key force being the great networker, the heroic figure that remakes all of society around a novel project that then gets planted in the world. This heroic networker undergoes tests of strength to dominate other actants and enmesh them in his (almost always his) network. The prior arrangements of other actants are obstacles and opportunities for overcoming and enlistment; they are there to be remade, but they are given no more respect or enduringness than their political strength demands. Prior arrangements seem little more than the residue of prior networkers.

Although the actant-network story captures some very striking phenomena in the making of the modern world, it does not capture the usual experience of most participants in the world. Although we may have grand ambitions to remake the world in our image, or at least with us at the center, we usually wind up learning to cooperate with those around us. We may even come to respect their way of living. Even those who have left their mark all over the world deal with intractable arrangements that preexisted them, and although they may influence and modify much of the world, those influences are enacted on playing fields that they have not fully defined. Although Edison (Bazerman, in press) wound up with more patents than anyone else and became the great American hero of the technological enthusiasm, he had to cope with a patent system that had developed long before him and was fairly set before his birth and he had to protect his claims in an even more ancient legal system. He gained substantial financial backing from the great financiers of his time, but to do that he had to learn to get along and appeal to the emerging climate of monopoly capitalism in his years working with the telegraph, telephone, and stock-ticker industries. He became a great hero in the American press, but only because he learned to play ball with reporters who had to produce stories for the new, mass-circulation, profit-driven, urban papers. His electric light stock

²The theory was first articulated in Callon, Law, and Rip (1986) but has been most extensively presented in Latour (1987).

did well on the financial markets, but only because financial markets had emerged in the preceding decades and he learned to appeal to the current climate of the securities markets. After early rejection by the European electricians he enlisted their support, in part by trials of strength and co-optation, but also because he embedded his work within the emerging specialty of electrical engineering, even while he was providing some of the prime projects around which the profession was forming. And at the end the networks of electrical engineering, the American press, the financial markets, and the patent system remained separate from, independent of, and in some sense stronger than the individual master of the networks. Even in his own conglomerate of Edison corporations, which he organized around his projects, Edison was just one of many players, and the organizations survived long after Edison became irrelevant to them, technically and corporately. The networks are structured environments for action that can be far more enduring than even the strongest of actors.

What I am suggesting is little more than providing a structurationist balance to our accounts of the social construction of technoscience, but the problem remains of what terms to use to describe the persistent, though changing, social landscape that we must come to terms with and act within if we are to act effectively. In the remainder of this article, I provide an account, as explicit as I can at this time and place, of descriptive tools that make continuing sense to me, as a teacher of writing trying to orient writers toward the different communicative environments they must write within. Every writer who has written competently for more than one venue recognizes that one needs to write differently for different venues, in different frames of mind, with different social motives, with different symbolic tools, and with awareness of different audience interests and knowledge. These differences may be embodied in unarticulated habits developed over years of specialized practice or may be articulated in a variety of terms—such as formal terms of conventions, political terms of arbitrary expectations of powerful groups, communicative terms attending to the audience's knowledge, rhetorical terms respecting the situational decorum and local topoi of persuasion, or activity-participation terms, as I discuss. In whichever terms one sees these differences, making the differences visible and salient gives one greater opportunity for reflective choice, for more considered writing and reading.

In orienting toward situations and noting their particularity, one can sense (or even consciously categorize) a situation as being of this kind or that kind, or having various kinds of elements at play. Various kinds of response are possible to these typified situations, and various kinds of actions have proven in one's experience or knowledge-by-reputation to have had various kinds of effects and consequences. That is, the typification embedded in genre is one of situation, possible response, motives realizable through imaginable actions, and projections of possible futures. Such is the theory of genre that has developed among a number of rhetoricians in recent decades (Bazerman, 1988, 1994; Berkenkotter & Huckin, 1995; Freedman & Medway, 1995; Miller, 1984), drawing on the rhetorical tradition, sociolinguistic work, and Schutz's ideas about the production of daily life (Schutz, 1967; Schutz & Luckmann, 1973).

Conscious categorization is not a necessary component of a genred orientation to the lifeworld, as different social environments may elicit from the individual different patterns of social perceptions and interactional habits without reflection on the differences of types. On the other hand, the formal social naming of types, developing a socially circulated vocabulary of differences, provides artifacts or tools for individuals to construct their perceptual and action map for evaluating their communicative environments and their discursive opportunities. Thus the emergences of the names of genres and the articulation of expectations, and even regulation of features (as in school

or edited periodicals or disciplinary forums), increase the social salience, definition, coorientation, and so on, of genres.

Genres, as well as other social distinctions that are embodied in our actions, perceptions, or conscious vocabulary of reflection and planning, help give shape to emergent action within specific settings. As the social world has become increasingly differentiated in recent centuries, many activities are carried out in many different kinds of social settings, with the consequences that discursive activities become increasingly differentiated. For Aristotle, the socially powerful discourses were limited in number and confined to the theaters, the agora, the student's wax tablet, and the philosopher's log. Discourses of women, slaves, and children outside of school were not considered socially powerful and therefore not worth much reflection, except as they might lead to social and cultural disorder. Today there are many more venues of socially influential discourses, and every discursive location is potentially recognizable as being highly influential. Linguists, sociologists, psychologists, and anthropologists study even the moments of play among children and the earliest interactions of parents and children as significant in shaping the discursive interactional worlds we come to live in.

We also study the many locations in the industries of knowledge production and dissemination: the anthropologists in the field talking with informants, back at the anthropological society presenting papers, then in the classroom lecturing to students (e.g., Clifford & Marcus, 1986; Geertz, 1988), or the small-particle physicists talking together at the accelerator in Tsukuba or Cern or Brookhaven or presenting a jointly authored paper to a conference populated largely by representatives of the other two accelerators (Traweek, 1988).

We recognize types to locate ourselves in discursive/activity landscapes at all degrees of fineness. Sometimes these types are idiosyncratic or ad hoc—a purely personal account that we use as a private map or share informally with graduate students who are being initiated into the mysteries and crafts of the professions. But sometimes these types are widely distributed in the professional lore or institutionalized, as in the journal that announces that it encourages five sorts of articles with particular characteristics.

Disciplines and specialties and co-citing research groups have frequently been described in terms of networks or communicative patterns (e.g., Mullins, Hargens, Hecht, & Kick, 1977), but looking at the types of communications and activities realized through the communications gives a specific interpretation to the notion of communication systems. The papers and representations that circulate among people are realized interactions through which the symbolic part of their work is accomplished.³

If we look at the discursive spaces organized through genres, we can look at the text organizing devices by which actions are staged within genres, such as the moves Swales (1990) found in scientific article introductions. This staged organization of activities has been particularly empha-

³ I am not here discussing the ways in which material practices are inscribed into the symbolic activity or the way multiple symbolic activities are heterogeneously brought into what looks like an isolated, internal discourse. I do note these important matters, so as not to be liable to the blindness of forgetting that the regularizations of discourse are related to other regularizations of practice including those of instruments, experimental methods, data-gathering tools, bibliographic methods, government funding, university organization, disciplinary reward systems, and so on. Moreover, each of these sets of practices may embody reifications of earlier ideational symbolic activities. Further, in the procedures by which heterogeneous elements are given standing, value, and force in a discourse, particular translations and transformations occur which define how each discursive action locates itself and operates within its heterogeneity within its particular set of focuses and simplifications. I consider issues of materiality and discourse in Bazerman (1988) chapter 11 and in Bazerman (in press) chapters 8 through 12.

sized by systemic functional linguists such as Martin (1992) and Hasan (1985). We can further look into the kinds of meanings and symbolic formations enacted within those spaces. Certain terms, representations, and visual images come to populate texts in various specialties and then are put together in acceptable combinations.⁴ Thus one could identify a domain of work by scanning the terms deployed in an article and then make fairly strong predictions about the kinds of issues, claims, and forms of argument to be enacted, particularly when combined with a scan of the organizational markers. Even further, if one were familiar with the discursive practices in the field, one could also identify the kinds of symbolic manipulations or syntactic relations among the pieces that will be well received within the particular communities in contrast to those that may appear as dubious. That is, the kinds of discursive spaces recognizable to participants as genres also mark out spaces of symbolic work, or thought. The forms of discursive configurations within a type of article are what publicly count as thinking like the member of a particular branch of specialized inquiry. And how well one is evaluated as thinking like a member of one's specialty—and therefore the credibility of what one claims—depends on the public representations enacted in specialized discursive spaces—that is, how strikingly and convincingly one makes an argument in terms recognized and valued within that specialty.

Socialization or training in a discipline or specialty is as much training in the craft of maneuvering one's way through the discursive spaces of the specialty as it is maneuvering through the laboratory—learning to formulate claims and arguments, learning to manipulate data, learning to write for publication in different forums, learning how to deliver conference papers, and learning to talk in the hallways with colleagues from different parts of the world (see, e.g., Berkenkotter & Huckin, 1995; Dias, Paré, Freedman, & Medway, in press; Prior, 1991, in press; Winsor, 1996).

Moreover, insofar as each text and each genre implies a set of relations, recognized social positions and roles, stances of cooperative or competitive work, and sets of typified discursive relations,⁵ learning to formulate statements of the accepted genres integrates the novice into roles and positions within structured relations. This is true for the public texts but even more for submerged communicative and symbolic work, for such work is not visible except to those who find themselves on the inside. That is, the subordination and division of laboratory labors as well as the participation of individuals in the aggregation and distribution of collective work are realized through the discursive spaces each member of the collective can come to inhabit, in negotiative dialectic with other members of the collective.

Elsewhere, for a language audience, I laid out a notion of systems of genre, which can be said to organize the discursive work and social relations within a domain (Bazerman, 1995). This can be seen most sharply in systems of legal proceedings where the entire work is carried out in the unfolding of a series of texts and utterances; all external resources to be made relevant to the court proceedings must be brought into the sequence of utterances by a process of translation and evaluation. Moreover, timeliness and type of utterance is crucial in the unfolding events, with only a limited range of types of utterances/texts being allowable, relevant, and effective at any moment. That moment itself is defined intertextually in relation to the previous unfolding of utterances/texts. All of this unfolds within a history of laws, precedents, and institutions.

⁴In this respect Halliday and Martin's (1994) investigations into how the history of nominalization and grammatical metaphor have populated disciplines with nominal objects to be studied, investigated, and symbolically manipulated are highly suggestive.

⁵Bakhtin (1981, 1986), in literary theory, called this the addressivity of texts and genres.

Each person entering the discursive complexes of a scientific field must learn to cope with those communicative means and processes that mediate participation with others. From a Vygotskian perspective, the mediating communicative patterns are tools both for action and cognition, or cognition in relation to action (Vygotsky, 1986). Though each participant in a discursive field need not think alike—indeed the discursive activities of disciplines largely rely on people not thinking precisely alike—each must draw on a common body of resources, cope with the same body of material and symbolic artifacts, master the same tools, and gain legitimacy for any new resources they want to bring into the field by addressing the same mechanisms of evaluation by which new concepts, tools, or phenomena gain standing in the discourse.

An historically grounded examination of the discursive systems within which disciplines are enacted reveals the continuity of work, problems, and concerns of a discipline whose discourse has been built in pursuit of its ends. Insofar as the work, problems, and concerns shift, those changes must be enacted and accomplished through the discursive system, with strains showing within the discourse. Such an examination also provides a means for evaluating the opportunities and possibilities in the current thought style, as Fleck (1979) characterized the representational and communicative habits of scientific communities. That is, by looking at the symbolic tools of a discipline, we can see what it is the tools can do while keeping in mind that individuals always find new uses for tools.

Closer looks at the discursive systems within different specialties may also give us a grasp of the perennial issue of problem choice and doable problems. The particular approach I have in mind to handle this is an interpretation of Vygotsky's (1978) notion of zone of proximal development (ZPD)—the area that is beyond one's full comprehension and mastery, but that one is still able to fruitfully engage with, with the support of some tools, concepts, and prompts from others. In Vygotskian research, the ZPD has traditionally been thought of as the area that a student can grow into with the help of an adult, teacher, or more skilled peer—by a process that educationists have labeled *scaffolding*. This concept has also been extended to consider the ways peers prompt each other dialogically to help them negotiate their way through unknown waters. Engeström (1992, 1996) provided tools for organizations to contemplate their own problem-solving processes and thereby make the organization smarter and able to engage in more difficult tasks.

If we now think of the discursive resources of a discipline or specialty as the tools it has for contemplating the problems and objects that are its concerns, we might be able to characterize not only the way of working through problems, but the means by which new objects are grabbed as just within the realm of possibility and the means by which the difficult to articulate is started to be formulated. Some disciplines, for example, may have more effective means for reaching beyond themselves than others—or at least some individuals in each field may have greater access to such tools than others. Because every knowledge-producing discipline works precisely in the ZPD—bounded on one side by the trivial and well-known and on the other by the unimaginable or ungraspable or unresearchable—this would seem an important issue for us to contemplate. Some work has already been done, for example, on looking at how reviews of the literature and other agenda-setting documents construct tasks for the future (Bazerman, 1991; Myers, 1991). It is worth noting that Vygotsky came up with the notion of the ZPD while considering intelligence tests; he observed that how rapidly and effectively the student could grow into new areas was at least as important for predicting student success at school as what a student could do on his or her own.

Examining the discursive organization of fields of knowledge production thus opens up tools for considering the social organization of cognition and the social organization of intellectual work,

bringing the most obvious parts of disciplinary work back into science studies. No matter how complexly, heterogeneously, and interest-driven we see the work of disciplines, we must remember it is by that work most discipline members define themselves, commit their energies, and evaluate the participation of others. We, of course, must be careful not to conflate the publicly displayed reasoning in a small range of high-visibility formal public texts with the full complexity of discursive activity in these fields or with the cognitive and material work that goes into the production of the formal and informal statements, but I doubt that the level of detailed observations and data we now have available will allow us to slip back into that error.

In considering what the discursive activity field of various endeavors can tell us about what it means to think like a physical chemist or a petroleum geologist or a cognitive scientist, we also gain a means of studying recruitment and socialization processes, by which individuals find a kind of work attractive, learn to maneuver in the conceptual and representational space of the discipline, and communicate successfully with others in pursuit of the disciplinary work. We can give a more concrete account of the old metaphor about learning to speak the language of specialty *x* or *y*. Socialization can be seen as a series of concrete tool/concept/artifact/mediation integrations into personal relations organized within activities (see, e.g., Berkenkotter, Huckin, & Ackerman, 1991; Blakeslee, in press; Prior, 1991, in press). Affective issues of trust, mentorship, and personal relationships in taking disciplinary perspectives can be given a concrete interpretation, as the mentee (initiated, sponsored, tutored, and directed by the mentor) is able to project him- or herself onto the discursive field and gain the rewards of participation. The degree and manner in which a person tries on a discursive system for size are matters of the discursive environments one finds oneself, the bets and hopes one invests in the discursive opportunities available in that environment, and the rewards one begins to perceive and receive through participation. This participatory view relocates the issues of recruitment and socialization as much in the neophytes seeking their own complex ends as in the old guard looking for new troops to carry on the old campaigns.

One purpose in developing accounts of disciplinary work is to provide guidance for neophytes and their mentors by giving them tools to characterize their experience, to make visible their situation and resources, and to frame choices for action. This is part of enabling practitioners in a field to carry out their projects and to provide wider access to participation in these projects. Such aims are at least equal with the critical agenda that has driven much of recent science studies. Even that critical agenda can be seen in a participatory framework, as providing tools for nonspecialists to participate in relevant decision making and for defining the limits of authority that we in our wider political, cultural, and social activities would wish to grant to those engaged in specialized knowledge practices.

Our recent heightened awareness of the social construction of knowledge should sensitize us not only to the multiplicity of potential representational practices, but also to the fact that each representational practice comes embedded in social dynamics and carries consequences for the way we live. Thus our own choice of which theories and research agendas to pursue is itself a moral problem, in that we have responsibility for the kind of tools for social reflection that we are building. Maps of cooperative work, useful intellectual labor, cognitive development through disciplinary participation, and the precise use of locally relevant communicative tools—maps that help exhibit useful orders in the world that will support our desired activities—are at this moment in history perhaps needed at least as much as maps that lay out the routes to power and dominance and maps that lay out escape routes for those who have felt the weight of powerful institutions.

We are in the middle of a remarkable moment in human history, where we are reexamining our social and institutional arrangements to extricate them from the hierarchies of symbolic and material coercion that have privileged a few and marginalized and exploited many. Moreover, those privileged have suffered from the narrowness required to assert and maintain their power and authority. Our current reformation of the practices of daily life may be seen as on a par with, and perhaps even a localized continuation of, the project to remove the political order from traditional coercive hierarchy, authority, and belief—a project that in the European tradition gained force in the 17th and 18th centuries. The achievements of modern democracy were built on more than critiques of the ancient regime; they were built on new inquiries into the bases and mechanisms of social order along with the means of producing trustworthy public knowledge with which the public weal could be advanced. These inquiries gave rise to new kinds of political, economic, and intellectual institutions. Even though we may now be dissatisfied with aspects of those enlightenment institutions, that does not relieve us of the responsibility of working toward a future we would care to have. Dismantling dominations we no longer find tolerable puts us on the spot of coming up with some order we can tolerate and perhaps trust. Considering the social discursive organization by which our knowledge is produced and enacted within the various domains of life is part of that project.

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