
Theories of the Middle Range in Historical Studies of Writing Practice

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Recent historical examinations of nonliterary, nontheoretical texts within their activity settings have aimed to identify the historically developed communicative and rhetorical resources currently available to writers and to reveal the dynamics of the formation, use, and evolution of those resources. These studies, in examining communal literate practices, combine theoretical, empirical, and practical concerns by building theories of the middle range. This methodological article elaborates how theories of the middle range can guide research through identifying interrelated levels of research questions (originating, specifying, and site specific) and identifying strategic research sites. This article further elaborates methods of finding, selecting, and analyzing relevant texts and placing them within appropriate social and historical contexts.

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In recent decades, the traditional historical work of rhetorical and literary studies in recovering, editing, and interpreting major texts has been supplemented by a new set of studies. These recent studies of texts in historical context attempt to unpack the complexity of the modern socioliterate landscape within which writers must act. This examination of nonliterary, nontheoretical texts within their activity settings aims to identify the historically developed communicative and rhetorical resources currently available to writers and to reveal the dynamics of the formation, use, and evolution of those resources. This work is exemplified by the numerous and growing studies of the history of the genres of scientific and academic practice (Atkinson, 1999; Batalio, 1998; Bazerman, 1988, 1991; Ceccarelli, 2001; Gross, Harmon, & Reidy, 2002; Kruse, 2006; Swales, 1998) carried out by scholars in rhetoric, composition, and applied linguistics. This work has also drawn on the reflective examination of disciplinary practitioners in fields such as economics (e.g., McCloskey, 1985), anthropology (e.g., Clifford &

Marcus, 1986), and psychology (e.g., Gergen & Graumann, 1996). This work is also related to inquiries of historians of science into the formation of textual practices of knowledge production (e.g., Biagioli & Galison, 2003; Dear, 1985, 1991; Johns, 1998; Shapin, 1994; Shapin & Schaffer, 1985) and work into the textual formation of social systems such as the law (Tiersma, 1999), businesses and corporations (Yates, 1989, 2005), nation building (Salazar, 2002), and documentary governance (Smith, 1999, 2005). Most deeply, this work elaborates the work of the anthropologist Jack Goody (1986), who studied the formation of modern literate society.

A Theoretical, Empirical, and Practical Project

These studies have elaborated writing as a complex, historically developed practice, composed of many small inventions that have expanded the repertoire, genres, skills, and devices available to contemporary practice. The social, organizational, and practical inventions are intertwined with the more overt textual inventions, which are selectively deployed by individuals within historically emerged social and institutional arrangements that have come to rely on literate action. Authorial options are shaped by the genres and activity systems in which individuals participate, but individuals make strategic choices to meet their local needs and interests. In turn, the social circumstances and arrangements are modified by the texts produced by individuals and circulated among individual activity participants, who respond to and take up the texts variously.

Understanding these processes expands possibilities for participation and creative agency, an agency that extends beyond individual action to remaking the organization of social projects and relations. This research also provides knowledge to support the development and socialization of our students into the complex literate systems of contemporary society. At this moment of rapid literate change as we learn to use the new tools of computation and the Internet, understanding the continuing historical development of literacy practices and the processes by which that history is realized is particularly useful (for elaborations of this perspective, see Bazerman, 2006; Bazerman & Prior, 2005; Russell, 1997). Ultimately, this research makes evident the importance of writing in contemporary society, building a public case for more extensive and appropriate writing education supported by the necessary resources.

Because this work is focused on the development of communal literate practices, the research looks on larger-group processes as well as the work

of individual actors. The social nature of this view combined with interest in contemporary practice places it in dialogue with contemporary social research, whether ethnographic, interview, survey, corpus linguistic, text analytic, or statistical study of indicators. Other volumes (e.g., Barton & Stygall, 2002; Blakeslee & Fleischer, 2007; Hayes et al., 1992; Kirsch & Sullivan, 1992; Lauer & Asher, 1988; MacNealy, 1999) provide methodological guidance for these other forms of inquiry; here, I focus on only historical inquiries.

As well, although the theory and work are primarily social and historical, they have potential theoretical and empirical relations to psychology and cognition from Vygotskian, pragmatist, or phenomenological perspectives. Such perspectives suggest that the contents, attention, and operations of our minds are influenced by cultural history, culturally produced and transmitted tools (including the symbolic tools of language), and the social circumstances from which we construe our rhetorical situations. Such perspectives tie the history of writing to the history of consciousness and tie personal writing development to intellectual and emotional development (Bazerman, 2006, in press).

Theories of the Middle Range

In this form of inquiry, theoretical and empirical historical programs are intertwined. This research goes beyond a gathering of details to a search for order and systematicity—in the historically produced systems of contemporary practice; in the processes by which practices, forms, and texts emerge, evolve, and decline; in the actual responses individuals and groups make within socially organized situations; and in the ways texts mediate actions and social relations.

This linkage of empirical and theoretical inquiries is reminiscent of (and in my case directly influenced by) Robert Merton's (1949/1968) call more than half a century ago for sociological theories of the middle range. According to Merton, theories of the middle range point to empirically researchable phenomena, relations, and mechanisms. He perceived sociology as split between the massive collection of details with no clear theoretical payoff and grand theories of society so sweeping as to be unconfirmable, even though they seem applicable in individual cases. In response, he advocated theories of the middle range to identify empirically researchable social phenomena and processes that, as they became confirmed and elaborated, might emerge into theories of somewhat larger sweep, but still well-grounded empirically.

Middle range theory seems appropriate to pursue in writing studies, given the complexity of writing—linguistically, psychologically, technologically, socially, historically, and even economically and anthropologically. On the one side, writing studies have inherited from the humanities very large theories that, although useful to point to examples and provide explanations, hardly have a general evidentiary warrant. Although these theories often have universal explanatory ambitions, even when successful in illuminating some texts and some acts of writing, they inevitably exclude many of the complex dimensions of writing. That sense of the complexity of writing has led some to consider writing only as an expressive and spontaneous art, never to be usefully described or accounted for by systematic inquiry, which is perceived as inevitably reductive and destructive of the phenomenon.

Recognition of the locality and complexity of writing has led to an explanatory modesty of much writing research that stays close to the data of individual classrooms and individual writers without providing us warrantable purchase on broader useful generalizations. And it also quickly cuts research of grander ambition down to size. When useful generalizations are found, they tend to be of the middle range. Thus, in psychological studies of writing, although few would say we have well-established theories of the mind and of writing process, the basic phenomenon that writers engage in a cognitive process is well established, along with good evidence that the nature of the process influences the text produced. Furthermore, we have evidence of differences in process between novices and skilled writers and differences related to task, situation, and conditions of writing. Similarly, with respect to classroom studies of writing, although few would say that we have fully warranted theories of classroom teaching and learning dynamics, there are some well-confirmed evidenced-based generalizations about preferable classroom and curricular practices, going back at least as far as Hillocks's 1986 metastudy of classroom research. Studies of emergent literacy, as well, have on many dimensions established that young children come to understand the written language as a system for meaning making and come to use it within increasing precision and focus in relation to communal shared practices. Recent reference books in writing and composition (Bazerman, 2008; MacArthur, Graham, & Fitzgerald, 2006; Smagorinsky, 2006) each provide many examples of well-researched and well-established writing phenomena and processes.

Most of these confirmed studies are based on gathering of evidence of contemporary observations, but not historical ones. Writing research methodology books focus on qualitative or quantitative method of currently observed phenomena and barely attend to historical studies (Blakeslee &

Fleischer, 2007; Lauer & Asher, 1988; MacNealy, 1999) and have no chapters on historical method, whereas two others (Hayes et al., 1992; Kirsch & Sullivan, 1992) contain one historical chapter each. History, of course, always lives under the burden of just being one damn thing after another, and in large part the interest and importance of historical research is to note the contingencies and multiplicity of forces that lead to unique and unanticipated consequences, some of which may be definitional for our current situation. More than a few historians are skeptical about any theoretical approach to the subject, and they advise sticking very closely to the evidence in the archive, which itself is an historical accident of what people wanted to collect at the time. Thus, applying a conceptual social science approach to historical material does not seem the best match.

Yet some historical generalizations have identified phenomena that have been confirmed and investigated and have defined the site for further empirical refinement. Since the time of Francis Bacon, large claims about the transformative effect of the printing press have had little empirical confirmation or elaboration. Elizabeth Eisenstein (1979), by framing the issue more precisely, was able to confirm that the printing press, as developed by systems of printers and printing houses, did make significant changes in the intellectual, political, and economic worlds of Europe and gradually the world. Furthermore, she and other scholars have identified some of the mechanisms by which this happened. The clarity of this account has in turn helped elucidate the impact of other technological innovations in writing and printing, both historical and current.

So how can researchers of writing locate those theories of the middle range that help identify investigatable historical phenomena to be confirmed and elaborated and on which scholars can build a systematic and principled picture of contemporary and future writing practices?

Levels of Research Questions

Merton (1963), in another methodological essay on problem finding in sociology, provides a way of sorting out research questions to understand how the largest questions can be tied to empirically researchable ones. He labels the different levels of inquiry as originating questions, specifying questions, location of strategic research sites, and site-specific questions.

Originating questions are the fundamental questions that form basic curiosities and motivations for inquiry; they are also often the sort of questions grand theories try to address directly and speculatively, with incomplete or

uncertain evidence. In writing studies such questions might be the following: How do people write? What are the mental processes involved in writing? Why do people write? What role does writing take in society and individual life? How do people learn to write? How can we help people learn to write? Most teachers of writing are likely to see these questions as important, and each may already have a preferred answer out of the many plausible possibilities. Because researchers do not have overwhelming, compelling evidence for a single generally accepted answer does not mean they should discard these questions and hypothesized answers. The originating questions help us remember the serious stakes in the research and help keep the rest of our work in focus. Furthermore, in a practical field such as the teaching of writing, both questions and hypothesized answers are built on a depth of practical experience that can form strong guides for finding verifiable phenomena and processes—even though our experience may be laden with idiosyncratic particularity, self-fulfilling prophecies, and self-justifications. Rather, theoretical orientations can frame narrower, specifying research questions on which we may be able to get empirical purchase.

Specifying questions define empirically verifiable phenomena or processes for confirmation and elaboration. The specifying question can focus our research attention, letting us know what we are looking for and suggesting criteria for knowing whether we have found it with sufficient certainty and detail.

For me, an early specifying question that gave a concrete direction to my underlying interest of how writing is used in society was whether and how deeply writing in one discipline differed from that of another. Although my teaching convinced me it was pedagogically useful to attend to disciplinary differences in writing, this view was not widely shared, even as the Writing Across the Curriculum movement began to develop. If I was to persuade colleagues that there was something to this approach, I needed to develop research that would establish and explore differentiation in writing. Even though I had no idea how I would proceed or what the data and analysis would look like, I sensed that examining disciplinary differentiation was the kind of question that empirical research could help answer. I committed to producing a colloquium paper on the question of differentiation. This work turned into the article “What Written Knowledge Does” (Bazerman, 1981). My studies that immediately followed relied on the evidence of differentiation in this article to then examine further specifying questions such as what disciplinary writing processes had consequences for the form of the final argument and how the particular genre of research report changed over time. As the picture of differentiation started to fill out, other specifying

questions followed: When did modern citation practices emerge in science? How did social roles and values emerge around the communicative relations of the text? How were the writing actions of particular writers located within the historically developed socioliterate system? How did technological innovators operate in the multiple discursive systems necessary for the completion of their projects? How did the modern concept of information develop, and how is it attached to particular genres and activity systems?

Committing to a focused research episode begins when the researcher has formulated a potentially answerable research question and begins a motivated search for an empirical site for investigation. At this juncture, the researcher moves from puzzling over questions, theories, and happenstance observations to an active and systematic search for evidence and answers. This moment of commitment to an inquiry may be attached to a specific deadline generated by a seminar or conference presentation, the need to complete a dissertation, or a publication opportunity. In such cases, external pressures as well as mentors can reinforce motivation for the hard work of archival digging, coherent thinking, and gathering courage for choice making and pushing through to the end. However, as one gains confidence in one's ability to identify conceptually significant researchable questions and relevant sites for investigation, the commitment to a focused investigation can be a more self-generated phenomenon, as ongoing thinking and serendipitous observation crystallize into a research project that has the promise of making progress on a difficult question. The art of spotting, respecting, and nurturing those moments of recognition is an important skill worth cultivating.

The strategic research site is a specific empirically locatable episode or location where you believe you will find the evidence that will help you answer your specifying question in robust enough form for you to be able to analyze and interpret it (Merton, 1987, 2005 **PLS PROVIDE REFERENCE**). A strategic research site is a place where a problem or phenomenon can be investigated more easily, in greater depth, or with greater clarity than other sites. The site may offer a particularly robust example of the thing you are looking for, or it may offer special advantage in producing detailed, well defined, accurate, or extensive data relevant to the research question. It may offer an example that is stripped of the usual taken-for-granted assumptions that obscure understanding. The site might show the phenomenon under stress or in the extreme, revealing otherwise hidden aspects. Whatever the particular advantage, the research site is chosen because it has the possibility of producing evidence to answer a question that is broader than the research site. Frequently, the most strategic site may not represent the most obvious or typical example. When I was invited for

a critical collection to analyze a complexly idiosyncratic text by Stephen J. Gould and Richard Lewontin, I was struck by how Gould and Lewontin used citations to create a novel position within the intertextual field of the disciplinary literature in order to restructure readers' views of the knowledge of the field (Bazerman, 1993b). The dramatic intertextual moves starkly evident in this one example, ultimately, pointed toward similar practices carried out less extremely and visibly in most scientific articles.

Similarly, in order to understand how empirical phenomena are represented in the scientific writing, I have found it useful to look at what we now consider scientific phenomena originally announced in texts from substantially different political, social, and ideological conditions. I found a striking example of such a contrast case when studying early texts on electricity. Otto von Guericke, a 17th century citizen of Magdeburg, is attributed with discovering repulsion in static charge; the diagrams from his 1672 work foregrounded his presence, bearing a globe on a stick with a small feather hovering above, giving him the appearance of a Magus. The phenomenon of interest to modern science occupied only a small part of the illustrations. Rather than dismissing the large part of the diagram as a quaint oddity, I saw von Guericke's self-representation as a strategic research site to study how phenomena and their meanings are embedded within social and ideological systems tied to political and economic conditions (Bazerman, 1993a).

These two examples highlight the importance of serendipity in finding a strategic research site (a point often made by Merton—see Merton, 1987; Merton & Barber, 2004). In the course of doing other things, one can come across exactly what you need to shed light on some issue you have been thinking about. The prior thinking and framing of questions allows you to identify something you run across as interesting and useful in addressing a major question, even though to others not engaged in the same way it may seem just another historical detail. The most remarkable example of this sort of serendipity I experienced occurred when I was discussing a question I was working on with some faculty and students on a campus I was visiting. I was puzzling over how we came to informationalize the environment—that is, how we came to think about the natural environment through information contained in particular documents rather than as experienced bodily in a walk through a field. In this discussion, an elderly scientist suggested I might look at a newsletter from a mid-1950s community group in St. Louis. The newsletter, called *Information*, grew out of citizen concerns about the effect of Strontium 90 fallout from nuclear bomb tests. On investigation I found out this newsletter arose in the nexus of wartime classified information, postwar desires for open circulation of scientific information, the

politics of citizen decision making over nuclear policy, and the immediate health threat to children. Furthermore, the antitesting movement associated with the newsletter contributed greatly to the formation of the environmental movement, and this newsletter was a direct precursor of the journal *Environment*. The analysis of the early issues of this newsletter revealed some of the key rhetorical assumptions, motives, and practices in our understanding of information in the last half century (Bazerman, 2001).

Site-specific questions shape research design and methodology. Once you have identified the strategic research site, your collection and analysis of data should be defined by what you want to know about the site in relation to your specifying question. That means that site-specific questions must attend to the particular character, opportunities, and difficulties of gathering data at the site as well as to the kind of analysis the data will allow. Nevertheless, the site-specific questions must still maintain a payoff for your motivating, conceptual interests.

Because each set of questions, each research site, and each set of data is individual, no one true method or set of procedures can guide one in defining the relevant corpora of texts and contextual data, the right method of collection, and the most appropriate analysis. Rather, methodology is simply being thoughtfully methodical in selecting, gathering, and analyzing data. Being methodical means being able to give a reasoned account of one's procedural choices in terms of the appropriateness, reliability, and persuasiveness for the questions at hand. Thus, methodology cannot be separated from site-specific questions. This may sound obvious, but often inquiry loses focus at this point as people apply a convenient, familiar method of data gathering even though it does not address the motivating questions. Similarly, researchers at this point may be overwhelmed by accessible documents or other data sources without asking whether the materials will give them what they are looking for. Alternatively, researchers may continue to pursue questions that they cannot reasonably hope to answer by the available data, no matter what method is used to gather and analyze it.

Document Finding and Selection

What Material Is Available and Where

An important element in methodical thinking is an honest assessment of what data are available at the site and the difficulties and costs in gathering them. In archival historical research, availability is often a matter of locating an archive or collection with relevant and useful material, and difficulty is often

a question of getting to the archives and restrictions in recording what you need. The ingenuity and serendipity come largely in conceiving what kind of materials might be available, what kinds might be relevant, and where archives might be that would contain that material. To attune yourself to possibilities, you might want to imagine idealized possibilities and see how those imagined desires match with existing archives: What information and documents would you wish were created or kept? Are there any real-world documents that are similar to your imaginings? What kinds of texts might contain the kind of information you are looking for, or what body of texts might you want to analyze? Can you locate that ideal evidence elsewhere? Might indirect sources tell you what you are hoping to know? Which parts of that fantasy evidence could you do without and still have integrity to the study? Are there preexisting collections of statistics, narrative overviews, organized archives of certain bodies of texts, records of meetings, personal letters providing surrounding attitudes about events and texts, or manuals of procedures that identify the means of production and distribution of texts? Furthermore, are these materials available to you in a convenient way nearby, or will extended stays be needed in archives in other cities? Will you need permissions to gain access to private archives?

As I became interested in studying scientific manuscripts, I began asking myself and others where such manuscripts might be located. Fortunately, at that time I lived in New York City, where there were many collections, but some were highly restricted in access and how you could work in them. After visiting a few, I found that the library of the American Institute of Physics had a small but very focused collection, an informality of procedures based on a personal approach, and microfilms of the papers of several prominent 20th century scientists with substantial draft materials. As I engaged in various travels, I asked myself whether there might be any materials of interest wherever I might be. Visiting Cambridge, England, later provided me an opportunity to pursue some questions I had about Newton's optical papers I was working on. Of course, access to the Newton manuscripts was very carefully controlled, but I was able to predetermine what I was looking for from microfilms and bibliographic tools, so my questions were quite focused, and the few notes I could make were sufficient. On the other hand, I made a truly surprising and lucky find when I was spending some months in Singapore with much free time: There was a bound full set of the Philosophical Transactions of the Royal Society at the National University library where I was able to get convenient access to them—which provided the materials for two core chapters of *Shaping Written Knowledge* (Bazerman, 1988). Now early journals are easily available digitally, but 25

years ago such detailed analysis would have been impossible without easy access to bound original copies.

Having located materials one wants to examine, one can often expeditiously get a sense of the available materials in various archives or collections or where particular documents are located by using general bibliographic tools as well as archive-specific catalogues. For example, when I found out about the St. Louis Citizens Committee newsletter, I thought it would be quite hard to find, but a search of my university library's electronic catalogue quickly turned up nearby copies, and I was able to obtain a full run of the newsletter through interlibrary loan, along with related materials. With the World Wide Web and rapidly improving search tools, the task is now even easier.

Selecting and Sampling

Although I have had the good fortune to examine many extraordinary and special materials, much of the archival material I have worked with is quite ordinary, to be found in most university and research libraries. In looking at the history of writing practices and forms, it is the most common of texts one is looking at, though you are adopting the perspective of an analyst rather than a primary consumer of the texts. In so doing, you are turning a part of the libraries holdings into a focused research corpus. With common materials the real trick is in deciding how to select, reframe, and sample from the large amount of material available in library holdings.

One way to deal with an overabundance of materials is to follow your nose from one document to the other until you have a strong conviction that looking at another 10 or another 100 documents won't tell you anything new. This is quite useful for inquiries, where you are using documents to find facts. Once you have a sense of all the kinds of documents available and have mined the kinds of facts each typically offers, diminishing returns on your continued digging may convince you that no new nuggets are likely to turn up no matter how much you keep digging.

If, however, you are trying to gain an overview of the trajectory, form, or typicality of the documents in an archive, you need a more systematic way of constituting a corpus and selecting from it—because you are looking to confirm generalizations about language practices themselves. The corpus needs to be framed around the research questions, and the sample needs to be large enough to turn up multiple examples of each variation so that you are not just looking at separate cases with no pattern. The corpus should be constituted by what kinds of documents will tell you what you need to

know about your specific research site. If you are tracing a genre, what journals does that genre appear in, and during what period? If you are considering the editor's role in shaping that genre, are there any documents that would reflect the editor's thinking or actions? If you are considering the representation of a social problem to political leaders, what would be the documents that would be the means by which such political leaders became informed on these issues? What would be the various social and academic literatures behind those documents? What further documents could tell you about the intentions and decisions of people transmitting information to the political leaders?

Similarly, the sampling within the corpus should follow your research questions. If you are examining organization of articles, you need to collect complete articles. If you are looking for certain lexical or grammatical features, you should consider whether random stretches of text will contain the features you are looking for, or there will be distribution according to text organization—such as citations, which might be more dense in review-of-literature portions of scientific texts, or quantitative elements that might appear in the results and analysis. If change across time is important to your study, the time gaps cannot be so great that massive changes will have occurred between samples. Rather, your time sampling should be tight enough to pick up both continuity and change; some qualitative reading of the corpus would be useful to give you a feel for the right time sampling. Also, you may want to select by criteria other than just randomness. Finally, the samples should not be so stripped of identifiers that you cannot recover contextual materials to help with interpretation if you need to do so.

As I began to look at the history of the scientific article, the real problem was how to make a reasonable selection from the vast runs of the many potentially usable journals. Because I began this work at the American Institute of Physics and I may have wanted to use other supporting documents in the society archives, it seemed obvious to look at the society's journal, founded in 1893, which remains the lead journal of the field. Even in its initial years there were 500 pages produced annually, and now it appears in four separate sections, which appear in 12 to 52 issues a year—for a total of almost 100,000 pages annually when I did this study in the early 1980s. So it was clear I needed to sample, but a random sample didn't make sense once I looked at a few articles and saw the great variation across the four divisions in any one year, and even in the pages of a single issue of a single division. Furthermore, the practices, theories, experimental apparatus, and data collection devices changed so much over the 90 years I was investigating, and each of these could influence what was written and how as much as any generic constraints and practices—or would be hard to disentangle from

any simple textual effects. Finally, although I knew some physics, most of the articles were over my head, particularly as the field progressed in the 20th century. So by scanning the issues I found in optical spectroscopy a subfield where the actual form and character of investigation (and even the kinds of apparatus and measurements) remained fairly constant over the 90 years despite technological and theoretical advances. Furthermore, this was an area that I understood moderately well; with the help of a physics grad student I was able to work through the more recent theoretical arguments. Having narrowed the area, the number of relevant articles also narrowed sufficiently to obtain samples that were fairly compact yet covered a substantial part of the full potential corpus. For different purposes, I then chose different samples. For article length I considered all articles prior to 1900, then all articles every 5th year through 1950, and after then all articles appearing in the first several issues. For more detailed analysis of selected features I took articles from every 10th year. And for sentence-level analysis I chose a small number of articles from four different years and 30-year intervals (Bazerman, 1984a).

Each study that I have done has required a different method of constructing the study corpus. For example, in looking at the relations between the older field of toxicology and the newer one of ecotoxicology (as well as intermediate environmental toxicology) to see how seriously we should take Thomas Kuhn's claims about paradigms being incommensurable, I thought it would be useful to look at several prominent journals at each of the fields. Within them I searched for articles which cited data from journals of the other fields. I also looked at textbooks to see how the fields were being represented to students who would be forming the next generation of researchers and practitioners. Textbooks are not consistently collected by university libraries, and I could not hope to get a full set in the relevant fields. On the other hand, my university has substantial programs in environmental studies and environmental sciences, so that I could take our library's large but incomplete textbook holdings as adequately representative of viewpoints. Within each of the textbooks I found from toxicology, ecotoxicology, and environmental toxicology, I looked for passages where they represented the work and findings of the other fields. In both journals and textbooks, I paid close attention to the data of publication (Bazerman & de los Santos, 2005).

Keeping Records

In the days before microfilms and photocopies, the person working with historical materials had few options in keeping records beyond taking notes

in longhand on cards or in notebooks. Now we have many options, including purchasing sets of microfilms, photocopying, downloading whole archives, harvesting words and phrases through search engines, and downloading citation data. The choices have to be related to each particular inquiry, your personal writing processes, the materials you are working with, and especially the kind of analyses you intend to be doing on your text.

Because many of my studies mix aggregate analyses of larger corpuses and detailed analyses of specific examples, and because I try to keep a vital relation between concepts and empirical details, my decisions about record keeping attempt to balance several imperatives:

- *Getting an overview sense of the entire corpus.* This means keeping some charts or tables or lists that help me see at a glance all I have and how the texts fall into different group categories.
- *Developing a conceptual sense of what is going on in the details of the material.* That is, I try to read through all the material I collect soon after I collect it rather than just piling up unread photocopies on my desk or PDFs in my computer. I will later return to these texts in a more orderly way for analysis, but at first I want to get a more grounded sense of what they are like and say.
- *Thematizing my focus on texts in relation to conceptual concerns.* Sometimes I simply keep journals of thoughts and observations, but sometimes I take focused notes on according to coding categories I establish. Sometimes I make structured note-taking templates which require me to characterize texts according to specific topics or parameters.
- *Having texts available so I can return to them to check details and to carry out more detailed analysis of selected individual texts.*
- *Maintaining good bibliographic records so I can find things I need and I can document the source of anything I come back to or use.*

Thus, I usually have a complex mix of primary materials, secondary notes, bookkeeping and overview documents, and stuff floating around in my head. I try to offload the cognitive demand of the stuff floating around in my head whenever I can by externalizing my thoughts, memory, organizational schema, conceptual systems into documents, files, sketches, organized piles of materials on my floor, or other external representations. But the productive creative process that puts the ideas together with facts, sees new patterns, gets to fresh approaches, notices contradictions and objections, and all the other intellectual work requires that some level of work constantly stays dynamic in the front and back of the mind. Such an approach requires that I stay in close touch with the data as they are gathered and analyzed, even if I am

using research assistants and standardized coding schemes. I need to stay in constant dialogue with my coresearchers about what they are finding and what questions and anomalies come up in the collecting, coding, and analyzing the data. I also find that I frequently must ask them to go over the original documents they are working with so that I can get a very concrete sense of the material and its peculiarities. Similarly, I find I cannot fully offload the task of analysis onto some externalized mechanical process with the results crunched out at the end. Although such work might confirm or disconfirm a focused claim, I don't know what I have looked at or what it means. Consequently, I accept that cognitive overload and headaches are inevitable costs of sifting through masses of data.

Methods of Analysis

In my work, the choices of analytical methods arise out of my inquiry questions, engagement with the materials as I collect them, and the emergent patterns that I find in accounting for the data. At some point, however, I try to articulate the kind of connections, patterns, and distinctions I am noticing into a formal mode of analysis that I use to inspect the material in an orderly way. I then inscribe this analysis in charts and tables, a preliminary document (which may be quite different from the projected draft of the study), or an actual draft of the study itself. That is, although I start with the materials showing me what they have to offer, I organize what I find to examine the texts systematically. The analytic scheme I develop at that point is conceptually meaningful but also sensitive to the data (for overviews of some of the available methods of textual analysis, see Barton & Stygall, 2002; Bazerman & Prior, 2005; Weiss & Wodak, 2002). This step of creating a principled and orderly analytic method allows me to look more carefully at patterns and details as well as provides a systematic examination of the data to make sure my claims really are supported by the evidence.

I treat the analysis as a distinct writing event, prior to and apart from the writing of the chapter, so that I can pursue the data rather than being concerned with a persuasive exposition. Parts of the writing from the analytical stage may find its way into the final presentation, but often I need to rewrite the analytical discussion for the final text from scratch. If I move too quickly from preliminary analysis to final argument, the meaning of the data may not fully emerge, and the essay may be conceptually weaker than it might be.

My first exploratory study to establish the degree and character of differentiation of writing in different disciplinary areas (Bazerman, 1981)

highlights the interaction of conceptual goals, materials selected for examination, and analytic method. As I did not know exactly what features might be differentiated or what might count as typicality in any domain, I had no a priori idea what would be useful to gather systematically. I did not even have a good idea of what an appropriate corpus might be. I decided to look for texts where differentiation might be most extreme and therefore most noticeable—namely, highly successful texts from each of the standard institutional divisions of the academy: science, social science, and humanities. Prominently successful texts may not be typical of their fields, but they are likely to instantiate in extreme form the values and techniques of the field as well as the nature of the game—for these texts have succeeded at their respective games.

As I wanted to look as fully at each of the texts as possible, I chose only one from each of the three domains. After reading each to gain a detailed understanding of the argument, I began to take notes and then draft analyses of the three texts based on how they presented or projected those arguments. My notes as they emerged seemed to address how the texts represented author, audience, and subject matter—the categories of the communication triangle (that goes back to Aristotle but has had many instantiations since, up through Kenneth Burke and James Kinneavy). So I began using these categories more systematically in my analytic note taking.

On the basis of these thematized notes, I wrote a brief interpretive essay on each of them. These essays focused on what each of the texts was attempting to accomplish or do with respect to each of the elements of the communication triangle and not just what they said. As these brief essays were organized around common themes, they easily could be aggregated into a three-way comparative structure. However, as I elaborated this essay, the citations and the background knowledge of the fields embodied in the professional literatures seemed to be taking on a prominent role in the analysis of each of the three texts, entangled in each case with author stance, audience knowledge and concerns, and representation of the subject matter. So in a revision, I separated the literature into a fourth comparative element, suggesting we think of the article bringing together four poles of representation, each element interacting equally with each other, in a rhetorical pyramid. This mode of analysis was so effective in highlighting distinctive differences among the three articles examined that I continued using it as a heuristic analytic model for a number of studies to follow.

As my studies became more elaborate, I often used multiple sets of data with separate modes of analysis appropriate to the role of each set of texts in the study. As I became interested in the skilled and focused choices of

scientific writers, I sought out corpora of process materials (notebooks and drafts) of again a successful scientist arguing for a controversial claim. Having located papers of Arthur Holly Compton surrounding his presenting confirming evidence for quantum theory in the 1920s, I had several relevant corpora of material to examine, each with a different function. The first set, in order to construct the rhetorical and scientific situation, was the most definitive histories and biographies I could find around this particular scientific controversy. Next was the sequence of papers Compton wrote on this topic, in which I was examining the development of the scientific concepts and ways of characterizing the phenomena. Another was the papers written by others in response, that, interspersed with Compton's articles, constituted a professional argument, which I examined for points at contention and the role of experiments and data of specific kinds in carrying forward the argument. The major corpus I focused on was the process materials on all the papers in the sequence, with specific attention to the notes, drafts, and revisions of one paper that I examined in depth. My data analysis of this last set of process materials began with noticing all changes Compton made within and across drafts. From these changes I developed categories that captured the character of choice making involved with each revision, along with their epistemological import. These grounded categories then became my analytical categories for the analysis in the final paper; the categories also provided an organizing structure for the discussion (Bazerman, 1984b).

This complexity of corpora and analytic methods was especially characteristic of my extended study of the Edison papers surrounding the development of light and power (Bazerman, 1999). Each of the kinds of documents in the Edison papers raised different issues. Patents raised such issues as the nature and scope of the patent claim, the degree of specification of the claim, the relation of the description to a projected or completed material technology, the way the text spoke to the criteria, and modes of inspection to be invoked by the patent office. Then these issues had to be placed within the history of the form of patent documents as well as the changing patent laws and the social networks developing around the invention culture. On the other hand, Edison's presence in the technical and scientific press had me looking not only at his articles and the surrounding articles in those journals but also the history of professional societies and technical education in England and France, which were passing scientific judgment in his work. I also looked into the formation of a journal that Edison sponsored to understand his professional ambitions. The study of his lab notebooks, of his presentation at public exhibitions, of his skill in projecting newspaper celebrity, of his strategies as financial fund raiser, and so on—each took me to different kinds of texts and archives to see how his project played out in multiple discursive worlds.

Opportunistic Concept Building and Serendipitous Data Finding

The opening of this essay might sound as though the research program described started as a coherent theoretical program with the details falling in place as they were filled in. Or perhaps it might sound like the natural consequence of masses of historical research piling up to be revealed in all their order. Of course it was neither. There is no privileged place of universal inquiry, a pure place from which to proceed. The conceptual and empirical program I have described is neither simply bottom up nor top down.

In the teaching of writing, practical experience raises significant and fundamental questions about writing and its learning. Thinking about those questions and reading deeply in theoretical and empirical literature around them prepare you to find the interest in what others may pass over as unremarkable and ordinary and can lead you to empirical inquiry. But then what you find suggests new ideas and new questions—perhaps the opposite of what you had imagined, or a refinement, or another level of specification. This inquiry then provides the opportunity to rethink theory, which both reframes your ongoing practical experiences and suggests new issues and phenomena for investigation. Thus, theory and concepts are heuristics for finding and seeing things in the world; conversely, noticing what exists in the world is heuristic for conceptual development.

Serendipity appears at all levels, in the kind of experiences that frame your fundamental questions, in the kinds of readings and theories you find that speak to your concerns, in encountering research opportunities that offer the possibilities of empirical answers to some focused questions, and even in having the time and the right shovel when you do find a spot to begin digging. What is no accident is the thoughtful and methodical reflection on how these come together. Through that methodical reasoning and investigation, we as a field can develop empirically supportable accounts that have some general value that rise above local happenstance.

If we are lucky, the picture, sketched at the middle range and filled out in empirical detail, gains a complementary conceptual, empirical, and practical coherence. The coherence can become a kind of treasure map to locate further theoretical concepts and empirical phenomena—and even more a practical map for successfully navigating the challenges of writing and teaching. With this coherence, all three forms of knowledge feed back on each other, lending richness to understanding and confidence to the vision. But if we are even luckier, what we find disrupts our expectations and identifies new theories of the middle range, which direct us to even more realistic paths of inquiry, thought, and experience—which we would do well to pursue.

References

- Atkinson, D. (1999). *Scientific discourse in socio-historic context*. Mahwah, NJ: Lawrence Erlbaum.
- Barton, E., & Stygall, G. (Eds.). (2002). *Discourse studies in composition*. Cresskill, NJ: Hampton.
- Batalio, J. T. (1998). *The rhetoric of science in the evolution of American ornithological discourse*. Stanford, CA: Ablex.
- Bazerman, C. (1981). What written knowledge does: Three examples of academic discourse. *Philosophy of the Social Sciences*, 11(3), 361-388.
- Bazerman, C. (1984a). Modern evolution of the experimental report: Spectroscopic articles in *Physical Review*, 1893-1980. *Social Studies of Science*, 14, 163-196.
- Bazerman, C. (1984b). The writing of scientific non-fiction: Contexts, choices and constraints. *Pre/Text*, 5(1), 39-74.
- Bazerman, C. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science*. Madison: University of Wisconsin Press.
- Bazerman, C. (1991). How natural philosophers can cooperate. In C. Bazerman & J. Paradis (Eds.), *Textual dynamics of the professions* (pp. 13-44). Madison: University of Wisconsin Press.
- Bazerman, C. (1993a). Forums of validation and forms of knowledge: The magical rhetoric of Otto von Guericke's sulfur globe. *Configurations*, 1, 201-228.
- Bazerman, C. (1993b). Intertextual self-fashioning: Gould and Lewontin's representations of the literature. In J. Selzer (Ed.), *Understanding scientific prose* (pp. 20-41). Madison: University of Wisconsin Press.
- Bazerman, C. (1999). *The languages of Edison's light*. Cambridge, MA: MIT.
- Bazerman, C. (2001). Nuclear information: One rhetorical moment in the construction of the information age. *Written Communication*, 18, 259-295.
- Bazerman, C. (2006). The writing of social organization and the literate situating of cognition: Extending Goody's social implications of writing. In D. Olson & M. Cole (Eds.), *Technology, literacy and the evolution of society: Implications of the work of Jack Goody* (pp. 215-240). Mahwah, NJ: Lawrence Erlbaum.
- Bazerman, C. (Ed.). (2008). *Handbook of research on writing: History, society, school, individual, and text*. Mahwah, NJ: Lawrence Erlbaum.
- Bazerman, C. (in press). Genre and cognitive development. In C. Bazerman, D. Figueiredo, & A. Bonini (Eds.), *Genre in a changing world*. Fort Collins, CO: WAC Clearinghouse.
- Bazerman, C., & de los Santos, R. (2005). Measuring incommensurability: Are toxicology and ecotoxicology blind to what the other sees? In R. Harris (Ed.), *Rhetoric and incommensurability* (pp. 424-463). West Lafayette, IN: Parlor Press.
- Bazerman, C., & Prior, P. (2005). Participating in emergent socio-literate worlds: Genre, disciplinary, interdisciplinarity. In J. Green & R. Beach (Eds.), *Multidisciplinary perspectives on literacy research* (pp. 133-178). Cresskill, NJ: Hampton.
- Biagioli, M., & Galison, P. (Eds.). (2003). *Scientific authorship: Credit and intellectual property in science*. New York: Routledge.
- Blakeslee, A., & Fleischer, C. (2007). *Becoming a writing researcher*. Mahwah, NJ: Lawrence Erlbaum.
- Ceccarelli, L. (2001). *Shaping science with rhetoric: The cases of Dobzhansky, Schrodinger and Wilson*. Chicago: University of Chicago Press.
- Clifford, J., & Marcus, G. (Eds.). (1986). *Writing culture: The poetics and politics of ethnography*. Berkeley: University of California Press.

- Dear, P. (1985). Totius in verba: Rhetoric and authority in the early royal society. *Isis*, 76, 145-161.
- Dear, P. (Ed.). (1991). *The literary structure of scientific argument: Historical studies*. Philadelphia: University of Pennsylvania Press.
- Eisenstein, E. (1979). *The printing press as an agent of change*. Cambridge, UK: Cambridge university press.
- Gergen, K., & Graumann, C. F. (Eds.). (1996). *Psychological discourse in historical perspective*. New York: Cambridge University Press.
- Goody, J. (1986). *The logic of writing and the organization of society*. Cambridge, UK: Cambridge University Press.
- Gross, A. G., Harmon, J. E., & Reidy, M. (2002). *Communicating science: The scientific article from the seventeenth century to the present*. New York: Oxford University Press.
- Hayes, J. R., Young, R., Matchett, M., McCaffrey, M., Chochran, C., & Hajduk, J. (Eds.). (1992). *Reading empirical research studies: The rhetoric of research*. Mahwah, NJ: Lawrence Erlbaum.
- Hillocks, G. (1986). *Research on written composition: New directions for teaching*. Urbana, IL: National Conference on Research in English.
- Johns, A. (1998). *The nature of the book: Print and knowledge in the making*. Chicago: University of Chicago Press.
- Kirsch, G., & Sullivan, P. A. (Eds.). (1992). *Methods and methodology in composition research*. Carbondale: Southern Illinois University Press.
- Kruse, O. (2006). The origins of writing in the disciplines: Traditions of seminar writing and the Humboldtian ideal of the research university. *Written Communication*, 23, 331-352.
- Lauer, J., & Asher, J. W. (1988). *Composition research: Empirical designs*. New York: Oxford University Press.
- MacArthur, C. A., Graham, C., & Fitzgerald, J. (2006). *Handbook of writing research*. New York: Guilford.
- MacNealy, M. S. (1999). *Strategies for empirical research in writing*. Boston: Allyn & Bacon.
- McCloskey, D. (1985). *The rhetoric of economics*. Madison: University of Wisconsin Press.
- Merton, R. K. (1963). Notes on problem-finding in sociology. In R. K. Merton, L. Broom, & L. S. Cottrell (Eds.), *Sociology today: Problems and prospects* (pp. ix-xxxiv). New York: Basic Books.
- Merton, R. K. (1968). *Social theory and social structure*. New York: Free Press. (Original work published 1949)
- Merton, R. K. (1987). Three fragments from a sociologist's notebooks: Establishing the phenomenon, specified ignorance, and strategic research materials. *Annual Review of Sociology*, 13, 1-28.
- Merton, R. K., & Barber, E. (2004). *The travels and adventures of serendipity: A study in sociological semantics and the sociology of science*. Princeton, NJ: Princeton University Press.
- Russell, D. R. (1997). Rethinking genre in school and society: An activity theory analysis. *Written Communication*, 14, 504-554.
- Salazar, P. J. (2002). *An African Athens: Rhetoric and the shaping of democracy in South Africa*. Mahwah, NJ: Lawrence Erlbaum.
- Shapin, S. (1994). *A social history of truth: Civility and science in seventeenth-century England*. Chicago: University of Chicago Press.
- Shapin, S., & Schaffer, S. (1985). *Leviathan and the air-pump*. Princeton, NJ: Princeton University Press.
- Smagorinsky, P. (Ed.). (2006). *Research on composition: Multiple perspectives on two decades of change*. New York: Teachers College Press.
- Smith, D. E. (1999). *Writing the social: Critique, theory and investigations*. Toronto, Ontario, Canada: University of Toronto Press.

- Smith, D. E. (2005). *Institutional ethnography: A sociology for people*. Walnut Creek, CA: Rowman Altamira.
- Swales, J. (1998). *Other floors, other voices: A textography of a small university building*. Mahwah, NJ: Lawrence Erlbaum.
- Tiersma, P. (1999). *Legal language*. Chicago: University of Chicago Press.
- Weiss, G., & Wodak, R. (Eds.). (2002). *Critical discourse analysis: Theory and interdisciplinarity*. London: Palgrave Macmillan.
- Yates, J. (1989). *Control through communication: The rise of system in American management*. Baltimore: Johns Hopkins University Press.
- Yates, J. (2005). *Structuring the information age: Life insurance and information technology in the 20th century*. Baltimore: Johns Hopkins University Press.

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