This article explores a method developed by Ragin called qualitative comparative analysis or QCA. QCA would appear to offer two attractive possibilities: (a) it combines a consideration of systematic and ideographic elements in a single analysis; and (b) it overcomes some notable limitations of traditional quantitative and qualitative methods. The aim of the authors is to contrast the logic and results of QCA with traditional qualitative and quantitative analyses through a consideration of labor management practices in the southern textile industry. The authors argue that QCA represents a bridge between traditional qualitative and quantitative approaches, because it draws on some aspects of each. It is not, however, without its own limitations, because it leaves out some very admirable aspects of these other methodologies. This analysis suggests that different methodological strategies should be used to complement one another, because each provides valuable insights that can be checked and augmented by the others.

Labor Management in the Southern Textile Industry

Comparing Qualitative, Quantitative, and Qualitative Comparative Analyses

JAMES E. COVERDILL
WILLIAM FINLAY
JACK K. MARTIN
University of Georgia

Sociologists rarely use more than one methodological approach in any given piece of research. If they do, the different methodologies are often segregated, with quantitative techniques being applied to one kind of question and qualitative techniques to another. Traditional quantitative techniques tend to focus on systematic factors that increase or decrease the likelihood of some event or the frequency of an outcome across a large array of cases. In contrast, traditional qualitative techniques highlight ideographic elements, the constellations of specific attributes that appear to explain

AUTHORS' NOTE: *This research was supported by a Faculty Research Grant from the University of Georgia Research Foundation to the second author. Address correspondence to James E. Coverdill, Department of Sociology, University of Georgia, Athens, GA 30602. Address e-mail to the first author at CMSCOVER@UGA.CC.UGA.EDU.*

SOCIOLOGICAL METHODS & RESEARCH, Vol. 23, No. 1, August, 1994 54-85

why some particular case experienced a particular event or outcome. For many qualitative researchers, an account of social life that focuses exclusively on general patterns and systematic causes eliminates the precise combination of particular attributes that provide, for them, satisfactory accounts of specific cases. In Fogel and Elton's (1983) terms, what is foreground for one strategy is usually background—at best—for the other.

Research grounded in one or the other traditional methodology presents only part of the story, however. We are of the opinion that analyses of both systematic and ideographic elements represent important components of a solid empirical analysis of a topic. In this article, we describe our efforts to explore the usefulness of a method for combining both of these elements developed by Ragin (1987), called qualitative comparative analysis (QCA). QCA would appear to offer two attractive possibilities: (a) it combines a consideration of systematic and ideographic elements in a single analysis; and (b) it overcomes some notable limitations found in traditional quantitative and qualitative methods, and especially in the analytic separation of the two.

Two prominent shortcomings of much quantitative analysis center on the issues of causal complexity and sample size. Ragin (1987) argued that quantitative analyses generally produce simplified causal models, in which causality is found by estimating the net effects of independent variables regardless of context, instead of more complex causal relationships based on specifying the different contexts in which certain variables become either more or less causally significant. Our reluctance to estimate complicated interaction models is often technically prudent; that prudence, however, severely caps the complexity of our substantive portraits. In a similar vein, Isaac and Griffin (1989) criticized the quantitative approach for emphasizing statistical significance over substantive importance, pointing out that this led researchers to increase sample sizes merely to make the attainment of statistical significance more likely. The result of these tendencies is that researchers have become disengaged from specific contexts and events (Ragin 1991).

Traditional qualitative analysis, which is often hailed for its sensitivity to context and event, confronts its own set of problems. The most evident is the inherent difficulty that arises whenever a researcher

emphasizes cases over variables and causal complexity over causal simplification—handling more than a very small number of cases quickly becomes unwieldy and unmanageable, even for a very skilled analyst. Equally well known is the problem of the representativeness of the cases. Cases are usually selected because they are theoretically interesting or historically important, not because they are statistically representative of a population.

Less often remarked on, though, is how qualitative analysis is done. Typically, researchers sift through piles of data, in the form of interviews, field notes, historical documents, and the like, looking for patterns, trends, similarities, and dissimilarities to shape into a theoretical explanation. The explanation is then presented, often flanked by suitable quotations to validate the key points. Short of going through these data themselves, there is little that outside readers can do by way of reanalysis. One may quibble with the argument, but in the absence of the complete reproduction of the field notes, interview transcripts, or historical documents, it is exceedingly difficult to ascertain whether valid inferences have been drawn, contradictory or ambiguous evidence omitted, or alternative explanations overlooked. The theoretical "story" that results from any piece of qualitative research is always a simplified representation of a complicated, confusing mass of data, leaving the reader to wonder whether there was evidence that did not quite "fit" the story.

The QCA approach that we explore in this article offers the prospect of circumventing some of the problems associated with the quantitative and qualitative strategies. In contrast to the quantitative approach, QCA maximizes causal complexity—causation is conjunctural and context specific because comparisons are being drawn among "holistic" cases, not abstracted variables. In contrast to the qualitative approach, QCA can handle many cases and forces the researcher to incorporate the values of every variable of posited importance in every case, thus increasing the likelihood that evidence will be used that does not fit the theoretical story that is being told. In sum, QCA offers the prospect of both better theory, through its logic of multiple conjunctural causation (by which is meant that various combinations of causes may produce a single outcome), and better data analysis, through its requirement that all cases be considered in the analysis.

Our aim in this article is to compare the differing logics and results of QCA and traditional qualitative and quantitative methods through an analysis of labor management practices in the southern textile industry. We will show that QCA does, indeed, represent a bridge between traditional qualitative and quantitative approaches, because it draws on some aspects of each. It is not, however, without its own limitations, because it leaves out some very admirable aspects of these other methodologies. Our analysis of labor management practices suggests that different methodological strategies should be used to complement one another, because each provides valuable insights that can be checked and augmented by the others.

The balance of the article is organized into four sections. The first describes the data, a sample of 22 southern textile plants. We then present a brief description of current labor management practices, in which we note that a more modern style of labor management has emerged alongside the industry's well-documented traditional style of paternalistic management (Blauner 1964; Edwards 1979; Leiter 1982; Leiter, Schulman, and Zingraff 1991). The third and main section of the article wrestles with the problem of why plants vary in their labor management practices. In this section, we present a short version of a qualitative analysis, a conventional quantitative analysis, and an analysis using QCA. Our main aim is to contrast QCA with the other two strategies, underscoring in the process what is gained and what is lost with QCA as a "middle-ground" methodology. The fourth and final section sums up our exploration of the three methodologies and draws out what we feel are the main strengths and weaknesses of QCA.

DATA

The study was designed to include all textile plants with more than 50 employees located within a 60-mile radius of a university town in the southern Piedmont region, which for many years has been the center of textile manufacturing in the United States. Plants were identified through use of a state-level manufacturing directory. We interviewed plant and personnel managers at 23 plants; managers at 4 plants declined our request. The plants ranged in size from 75 to 800 employees; most had between 200 and 500 employees.[1] The inter-

viewing took place between June 1989 and April 1990; every interview, with one exception, was tape-recorded and transcribed.

The interview format was semistructured. Managers were asked questions under four general rubrics: how their plants went about hiring production workers; the presence and character of internal labor markets; the technology used in the plants; and their product markets and production strategies. The semistructured format permitted managers to discuss other issues as well.

TWO KINDS OF LABOR MANAGEMENT

The interviews uncovered two qualitatively distinct kinds of labor management practices within these plants. The first we call conventional management (CM); the second, progressive management (PM). We identified 15 CM plants and 7 PM plants. This distinction was based on the discovery, during the course of the interviews, that some textile plants were "anomalous" (see Burawoy 1991b, esp. pp. 9-11), meaning that they did not conform to our understanding of the typical practices of traditional, paternalistic management. After further analysis of the interviews, we concluded that the plants could be separated on the basis of four key indicators: educational requirements for new hires; internal labor markets; employee involvement programs; and compensation practices. The "ideal-typical" (see Lofland and Lofland 1984) PM plant (a) required new hires to have graduated from high school; (b) restricted new hires to entry-level positions at the bottom of their often rudimentary, but nonetheless discernable, internal labor markets; (c) offered employee involvement programs like quality circles and work teams; and (d) paid workers by the hour instead of by the piece.

In this section, we show more formally the configuration of values on the four indicators for each case. We also present the results of a principal-components factor analysis to demonstrate that the distribution of factor scores for the cases breaks into two basic groups that correspond with our qualitative distinction between PM and CM plants. Table 1 presents three types of evidence. Panel A presents correlations among the four indicators—all scored as 0/1 dummies—that serve to distinguish PM and CM labor management practices.[2]

TABLE 1: Covariation Among the Four Indicators of Labor Management Practices

A. Correlations

	EDUC	*ILM*	*TEAMS*	*PRATE*
EDUC	1.000			
ILM	.748	1.000		
TEAMS	.498	.638	1.000	
PRATE	−.498	−.638	−.804	1.000

B. Principal-Components Factor Analysis (factor matrix)

	Factor I
EDUC	.796
ILM	.887
TEAMS	.865
PRATE	−.865

Eigenvalue = 2.916; percentage of variance explained = 72.9

C. Listing of Cases

ID Number	*EDUC*	*ILM*	*TEAMS*	*PRATE*	*MANAGED*	*Factor Score*
		CM plants (n = 15; 68% of the 22 plants)				
10	0	0	0	1	0	−.891
11	0	0	0	1	0	−.891
14	0	0	0	1	0	−.891
15	0	0	0	1	0	−.891
16	0	0	0	1	0	−.891
17	0	0	0	1	0	−.891
18	0	0	0	1	0	−.891
19	0	0	0	1	0	−.891
22	0	0	0	1	0	−.891
23	0	0	0	1	0	−.891
12	0	1	0	1	0	−.295
20	0	0	1	1	0	−.289
9	0	0	0	0	0	−.289
13	1	1	0	1	0	.278
21	1	1	0	1	0	.278
		PM plants (n = 7; 32% of the 22 plants)				
3	0	1	1	0	1	.910
4	0	1	1	0	1	.910
1	1	1	1	0	1	1.482
2	1	1	1	0	1	1.482
5	1	1	1	0	1	1.482
6	1	1	1	0	1	1.482
8	1	1	1	0	1	1.482

NOTE: MANAGED = PM (progressively managed) plants are coded 1, 0 otherwise; EDUC = new hires must generally hold a high school degree is coded 1, 0 otherwise; ILM = coded 1 when hiring is restricted to the entry level and an internal labor market is present, 0 otherwise; TEAMS = plants that have employee involvement programs are coded 1, 0 otherwise; PRATE = plants that have piece-rate payment practices are coded 1, 0 otherwise.

The correlations among the four indicators are moderate to large in size. Panel B presents the results of the principal-components factor analysis of the four indicators of labor management practices.[3] The analysis yields a one-factor solution with large factor loadings on all four observed indicators. All loadings are at least .8 in absolute value; nearly three quarters of the variance of the observed indicators is explained statistically by the single common factor.

The lower half of Table 1 (Panel C) lists the 22 cases along with their values on the four indicators (EDUC, ILM, TEAMS, and PRATE), our qualitative coding of each plant's labor management practices (MANAGED), and the regression-based factor score. CM plants are grouped together in the first block; PM plants are in the second block. Two thirds (10 of 15) of the CM plants have the largest negative factor scores (–.891). Those plants lack educational requirements for new hires, internal labor markets, employee involvement programs, and hourly wage compensation. Several CM plants have some mixture of values on the four indicators. We qualitatively code those plants with the other CM plants, because they are far more akin to the CM plants than they are to the PM plants.

Our decision to code Plants 13 and 21 as CM warrants further explanation. Two factors are involved. The first is that our decisions that these plants actually require high school diplomas and restrict hiring to entry-level positions were, by and large, judgment calls. This is what the plant manager at Plant 13 said in response to our question about requiring a high school education: "We have hired some people who do not have a high school education, but we have a sort of unofficial rule of not hiring you if you don't have a high-school education." This is what the personnel manager at Plant 21 said in response to our question about entry-level hiring: "95% of the people that are hired start off at entry level. But we do make exceptions." An exception would be someone who had experience at another hosiery mill.

The second and decisive factor in labeling them CM was the overall nature of the management in the two plants. These plants continue to rely heavily on personal ties in recruiting new employees. For example, the personnel manager at Plant 21 mentioned that in making a hiring decision he considered, in addition to the high school diploma, whether the applicant had made arrangements for adequate child care

and what kind of work habits his or her parents had, both of which were easy to ascertain: "And the most fortunate thing about being a little small area, we know everybody." In coding these plants, therefore, it was clear to us that they were CM plants, despite some inconsistencies on the four primary indicators that we use to identify PM and CM plants.

All but two of the PM plants look alike on the four indicators. The two plants that differ (Plants 3 and 4) do not require new hires to have high school diplomas. Both plants, however, hire through the U.S. Employment Service and require applicants to take the General Aptitude Test Battery (GATB), a test developed by the federal government and designed to measure nine work-related aptitudes (see Dobrish, Wolff, and Zevnik 1984, pp. 109-12). Test scores are used to screen applicants: "We require a certain percentage on that test before we will consider someone for employment" (Plant 4). The test is thought to measure cognitive ability. One manager described it as "a preemployment test which is probably about a seventh grade aptitude test" (Plant 3). In sum, although they do not require a high school degree, these two plants nonetheless screen out applicants in a more "formal" way than is the case at CM plants, leaving them very much like the other five PM plants.

Because it is sensible to think of Plants 3 and 4 as having something akin to an education requirement for new hires, it is reasonable to argue that the factor scores for those two plants are actually higher than they appear (both have factor scores of .910). There is then a notable break in the distribution of factor scores that corresponds rather closely to our qualitatively based MANAGED variable. In fact, the correlation between the factor score and the dummy-coded MANAGED variable is .922. The dummy thus captures about 85% of the overall variation in the factor scores.

Our qualitative assessment of labor management practices is strongly reinforced by the results of the factor analysis. The factor analysis, however, draws out the seven cases that are not pure CM or PM plants, and forces us to think seriously about these cases and, in particular, whether they represent some form of "hybrid" management strategy. Our conclusion—based on returning to these cases and considering them in detail—is that five of those seven are CM plants and two are PM plants.

ACCOUNTING FOR THE DIFFERENT MANAGEMENT STRATEGIES: DISJUNCTIONS BETWEEN QUALITATIVE, QUANTITATIVE, AND QUALITATIVE COMPARATIVE ANALYSES

The mere existence of PM plants indicates considerable change since the time Blauner (1964) and even Edwards (1979) wrote about textile plants. Why are some plants progressively managed while others remain conventionally managed? In this section, we explore that question from three distinct methodological positions.

TRADITIONAL QUALITATIVE EXPLANATION

There are a variety of forms of inductive qualitative analysis. Our approach, both in style and technique, most closely resembles the "constant comparative method" depicted by Glaser and Strauss (1967) and, to a lesser extent, the "extended case method" outlined by Burawoy (1991a, 1991b).[4] It consisted of three steps. First, we analyzed the data while they were being gathered to identify deviant cases or anomalies—outcomes contrary to what we expected (see Burawoy [1991b] for a discussion of anomalies). In our study, this was the discovery of the PM plants. Second, we sought to explain these anomalies by both exploring the issue more intensively in subsequent interviews (by asking more specific questions about changes in labor management policy) and by reanalyzing the interviews we had already completed (our experience is that explanations of phenomena are often overlooked in initial analyses of qualitative data). Third, these explanations were highlighted and organized into theoretical categories; the evidence was then sorted into these categories in much the same way (to use Van Maanen's [1988] analogy) as mail got sorted in an old-fashioned post office. The slots with the most mail—with the most illustrations of a particular category—became the causes of progressive management, which we discuss below.

Examination of the interview data led us to identify three causes of progressive management.[5] First, new ideas and theories of labor management, many of which gained considerable currency in the wake of the success of Japanese businesses, caused some companies to reevaluate their labor management philosophies. Second, the new product market strategies employed by textile manufacturers to combat their loss of market share to imports changed how these companies trained and used their workers. Third, new technologies of production that were introduced in the textile industry in the 1970s, most notably open-end spinning and shuttleless looms, led plants to raise their hiring standards.

There is little doubt about the impact of new theories of management on the textile industry. At every one of the PM plants, managers explained the introduction of employee involvement programs in terms of modern theories of management spun by the likes of W. Edwards Deming and Philip Crosby (1979). The most vivid account came from a company whose chief executive officer read Crosby's best-selling book on total quality management in December 1980. In January 1981, he sent copies of the book to his top executives and followed this up with a letter 2 weeks later in which he announced that they would be holding a 4-day conference with Crosby in February to begin implementation of the Crosby program. Lower-level managers were subsequently required to attend one of Crosby's week-long training programs; the company's objective was to have every one of its managers attend Crosby's "school." The chief executive officer (CEO) assigned responsibility for implementing the total quality management program to a division president to underscore its importance; he later promoted this man to chief operating officer, the second-ranked position in the organization. In 1989, the company was awarded a prestigious national quality award and was hailed by the secretary of commerce as a role model for total quality management in the 1990s, for, among other things, its effectiveness in delegating authority to self-managed work teams on its factory floor.

It is not just that the managers at the PM plants were aware of modern ideas, however. They were also part of large, complex organizations whose corporate executives supported this policy both administratively and, more important, financially. One plant manager declared: "So we are now under the umbrella of Corporation X. We are part of them, which is a very progressive company; they have given us some of the capital backing that we needed to be on the top" (Plant 1). A personnel manager emphasized the role of corporate managers in establishing PM: "And it starts at the top. You can't start it at the middle or the bottom. . . . The truth of it is, it's like anything; business

is a pyramid. You have somebody on top and it's all got to come down and filter down the sides and permeate the whole pyramid" (Plant 5).

The second factor we consider in explaining the differences in labor management is product market strategy. During the 1970s and 1980s, U.S. textile firms developed two strategies to counter the increased competition they were facing. Strategy 1 was a low-cost, niche production approach: firms would produce small amounts of a narrow range of products seeking, by holding down costs, to generate a small profit on products and quantities that few other firms were manufacturing. Strategy 2 was a high-quality, multiple-segment approach: firms would manufacture goods of high quality and at the same time possess the technology and personnel to be able to respond rapidly to shifts in market demand (Bonham 1991).

A good example of the first strategy is Plant 17 (a CM plant), a corduroy manufacturer with 350 employees. During the 1950s, it employed approximately 1,200 workers to make corduroy for the home-furnishing and apparel producers. Stiff competition during the late 1970s led to the decision to withdraw from much of the corduroy business and to confine production to the relatively low-volume, infant apparel end of the market. This corduroy is quite different, because of its high rib count and low weight, from the heavier corduroy used by jeans manufacturers, for example. Management has deliberately chosen not to compete in the high-volume apparel market, such as corduroy for jeans, because it was a "rat race with all those giants." Management's objective was to find "a niche that you can fit. Get out of the commodity business and try to get into a specialty thing, if you can do it."

An example of the second strategy is the development of the quick response (QR) system by the firm whose CEO read *Quality Is Free* (Crosby 1979). QR is a just-in-time philosophy of production management designed to slash the time it takes for fibers from suppliers to be weaved into fabric and shipped to apparel companies and to give plants greater production flexibility to respond to a greater variety of orders. In tandem with QR, the company has sought to enhance the quality of its production: it has set a goal of "zero-defect" fabrics for its plants to eliminate the need for its apparel customers to have to reinspect its products.

As the above examples suggest, there appears to be a very strong connection between a firm's product market strategy and its plants' labor management strategy. Plants operating under the niche production strategy have adopted labor management policies designed to hold down short-term labor costs, including hiring less educated and, therefore, less marketable applicants and paying them by the piece. In short, they are the CM plants. Plants operating under the multiple-segment strategy are unconcerned with short-term labor costs and more willing to incur the expense associated with progressive management practices like internal labor markets and employee involvement programs. These are the PM plants.

The third and final explanation of progressive management that emerged from the interviews was technology. Managers at PM plants frequently cited technological advancement when asked why their hiring standards had become more stringent: "Everything's run on a computer, and if you don't have a high school degree, you're just going to get run over by everybody else" (Plant 6). On closer examination, however, the influence of technology is rather more complicated than this quotation would suggest. What mattered was the context in which the new technology was introduced.

Managers in PM plants saw the equipment as having changed the work of operators. They were now expected to become responsible decision makers who would exercise mental skills. One plant manager said that modern equipment was "more complicated," which in combination with stricter quality standards, "just makes the job more difficult, as far as skills are concerned. Not as far as physical exertion is concerned, but as far as mental exertion is concerned" (Plant 2). Managers in CM plants saw the equipment as having changed the work of technicians. The machines were evaluated in terms of their maintenance difficulties, because of the precision and speed at which they functioned, as well as in terms of the need to retrain the mechanics and fixers who serviced them. In the PM plants, the new machines were used to promote a fresh vision of a multiskilled, flexible workforce, with each worker capable of performing a variety of tasks. In the CM plants, the new machines were incorporated into the existing vision of a factory staffed by workers who exercised a narrow range of skills and performed specific tasks.

The above analysis highlights some of the particular strengths of the traditional qualitative approach.[6] First, its use of an evidence-based logic of explanation encourages a sustained dialogue between ideas and data; the explanations that are constructed are anchored very tightly to the data. Second, this approach makes it possible to pursue some fairly complicated interactions among the different explanatory factors. In many instances, the impact of a particular independent variable will depend on the context—mitigating circumstances will either enhance or reduce its effect, as the case of technology indicates. Qualitative analysis encourages the analyst to incorporate mitigating circumstances in the explanatory framework. Third, the qualitative approach means examining cases as whole entities, which of course, is how they are found and often experienced in social life. Variables are part of cases rather than being independent of cases. Fourth, this approach makes it possible to identify the ideographic elements that shape outcomes. Only in a qualitative analysis can a chief executive's leisure-time reading become a significant determinant of a change in labor management strategy.

The drawback to this approach lies in the fact that analysts may push cases that do not conform to the theoretical story to the margins of the analysis. The approach contains no mechanism that compels consideration of dissident or complicated cases, even though they may point to an alternative story that is equally worthy of being told.[7] As Van Maanen (1988) notes, in most qualitative explanations a "convention of interpretative omnipotence" prevails (p. 51). Who can say, in other words, whether ideal-typical cases are either ideal or typical? In quantitative terms, the researcher is able to freely manipulate a vector of sampling weights and thus stack the deck in favor of certain conclusions.

QUANTITATIVE ANALYSIS

The quantitative analysis that follows generates additional substantive insights into labor management practices in the southern textile industry. It illustrates how the logical structures of traditional qualitative and quantitative analyses can lead us toward different substantive conclusions. It also serves as a useful point of contrast with which to highlight the distinctive properties of QCA as a methodology that bridges traditional qualitative and quantitative approaches.

Our quantitative analysis, however, is unusual in two important respects. First, we used the qualitative analysis to guide our selection of the variables for the quantitative analysis. In light of our qualitative evidence, we considered four variables that might covary with labor management practices according to current explanations of organizational behavior: technology, firm size, perceived competition in the local labor market, and production strategies.[8] Unlike the qualitative analysis, however, the quantitative analysis required that we (a) wrestle with the task of systematically coding the four variables of interest and (b) draw all cases into the analysis. Second, the quantitative analysis draws on the same body of evidence—the 22 interviews—from which we constructed our qualitative analysis. We do not see the evidence as implying a particular methodological strategy, although the small-*N* and the nonrandom sampling scheme certainly raise questions about the use of standard logics of statistical inference. In the following paragraphs, we first briefly describe the four variables that form the core of the quantitative analysis; we then discuss the results.

Technology

New technology is often cited as a major reason why firms change their hiring criteria and work practices (e.g., Adler 1986; Bell 1973; Zicklin 1987; Zuboff 1988). Recent years have witnessed considerable modernization of textile production. Changes in technology and the salience of technology in the minds of textile managers suggests a simple question: To what extent are the differences between PM and CM plants a function of their technologies? To answer this question we divided the 22 plants into two categories according to their level of technology (the variable TECH): advanced versus traditional/mixed. The advanced category (coded 1) includes only plants whose technology is state of the art; for example, spinning plants in which only open-end rotors are used and weaving plants in which only shuttleless looms are used. Plants that lack advanced technology are either traditional or mixed; they are coded zero on the dummy variable TECH.[9]

Competition in the Local Labor Market

Pfeffer and Cohen (1984) argue that the scarcity of labor can prompt an employer to raise pay levels or attempt to restructure work and compensation practices in such a way as to both attract more job candidates and lower turnover. Internal labor markets, a team orientation to production, and paying workers by the hour—management strategies we identify with progressive management—could be viewed as practices aimed at making an organization more attractive in the eyes of potential recruits and current employees. Progressively managed plants might thus be a response to the press of conditions in local labor markets. Evidence from the interviews allowed us to determine whether or not managers believed there to be considerable competition in the local labor market (coded 1; 0 otherwise).

Size

A third possible cause of the different labor management practices is organizational size. Large, multiunit organizations have been the primary innovators in the field of management strategy (Chandler 1977). They are the ones which (a) have been able to afford to implement new systems of human resource management (Florida and Kenney 1991; Jacoby 1985), (b) have the greatest degree of contact with and responsiveness to the latest trends in this field, and (c) are most concerned to demonstrate that their management practices are up to date (DiMaggio and Powell 1983). Consequently, we would expect plants owned by large organizations to be the ones most likely to have progressive labor management policies. Size is measured by a dummy variable coded 1 (0 otherwise) if the plant is part of a firm with at least 10,000 workers. This cut point was chosen because it separated two distinct clusters of plants: The largest "small" firm has 6,500 employees; the smallest "large" firm has 15,000.

Niche Production

The fourth and final factor we consider is product market strategy (Porter 1980, 1985). Evidence that the type of business strategy a firm chooses affects its industrial relations system is found in Arthur's

(1992) analysis of U.S. steel minimills. Mills that had a low-cost strategy were most likely to have cost-reducing industrial-relations strategies (similar to CM policies), whereas mills that emphasized high-quality production were most likely to have commitment-maximizing industrial-relations strategies (like PM policies). We add an additional strategic factor—whether firms compete across a variety of market segments or within a particular segment—to create a composite variable called niche production. The variable is scored 1 (0 otherwise) when the plant has a low-cost, niche production strategy.

Results

Table 2 contains cross-tabulations of technology, size, labor market competition, and niche production with labor management strategy. Panel A shows that plants with advanced technology are somewhat more likely to be progressively managed than are plants with lesser technology. But labor market competition appears to have little effect on whether a plant is PM or CM, and any difference that does exist is contrary to our expectation. Panels B and D display strong associations that are consistent with our expectations. In short, plants that are part of large firms tend to practice progressive management, and virtually all of the seven plants enacting a strategy of niche production are conventionally managed.

Table 3 pushes the analysis beyond the bivariate cross-tabulations in Table 2. Table 3 presents the results of two multiple regression models, identical except that the second includes the interaction between size and technology. The dependent variable in both regression models is the nominal variable MANAGED, distinguishing CM and PM plants.[10] Firm size proves to be the key variable in both regression models. Model 1 shows that, net of other factors, firm size boosts the probability by .781 that a plant will practice progressive management. That is, of course, a huge change in the likelihood of progressive management and is consistent with both the tabular results presented in Table 2 and our theoretical expectations.

The second regression model includes an interaction term based on technology (TECH) and firm size (SIZE). In this model, we consider one portion of our earlier argument, namely, that the effect of technol-

TABLE 2: Cross-Tabulations of Labor Management Strategy and Technology, Firm Size, Labor Market Competition, and Production Types

A. Technology

	Does the Plant Use Primarily State-of-the-Art Technology?	
Labor management strategy	*No (13)*	*Yes (9)*
CM	77%	56%
PM	23%	44%
Total	100%	100%

B. Size

	Does the Firm Have at Least 10,000 Employees?	
Labor management stragegy	*No (15)*	*Yes (7)*
CM	93%	14%
PM	7%	86%
Total	100%	100%

C. Labor Market Competition

	Is There Considerable Competition in the Local Labor Market for Workers?	
Labor management stragegy	*No (5)*	*Yes (17)*
CM	60%	71%
PM	40%	29%
Total	100%	100%

D. Niche Production

	Is Production Aimed at a Specialty/Niche Market?	
Labor management strategy	*No (15)*	*Yes (7)*
CM	53%	100%
PM	47%	0%
Total	100%	100%

NOTE: There are 15 CM (conventionally managed) and 7 PM (progressively managed) plants.

ogy on management practices depends on both firm size and the plant's production strategy. We are unable, given sample size and the strength of the associations we observe, to consider the interaction involving all three of those variables (the term based on TECH * SIZE * NICHE has no variance because no plants are coded 1 on all three variables). The simpler interaction term based on firm size and technology is large and positive, a pattern congruent with our expectations. In large firms, advanced technology boosts the likelihood of progressive management; in smaller firms, advanced technology decreases the likelihood of progressive management.

TABLE 3: Correlation-Based Results

A: Correlation Matrix

	MANAGED	*TECH*	*SIZE*	*LMCOMP*	*NICHE*	*TECH*SIZE*
MANAGED	1.000					
TECH	.226	1.000				
SIZE	.790	.226	1.000			
LMCOMP	−.095	.010	−.328	1.000		
NICHE	−.467	−.370	−.467	.370	1.000	
TECH*SIZE	.690	.567	.690	−.026	−.322	1.000

B. Regression Results (standard errors in parentheses)

Variable	*Model 1*	*Model 2*
NICHE	−.199	−.238
	(.171)	(.167)
TECH	−.025	−.175
	(.142)	(.171)
LMCOMP	.261	.200
	(.170)	(.169)
SIZE	.781	.538
	(.158)	(.224)
TECH * SIZE	—	.425
		(.288)
(Constant)	−.058	.063
	(.177)	(.184)
R^2	.682	.720

NOTE: MANAGED = PM (progressively managed) plants are coded 1, 0 otherwise; TECH = plants with primarily state-of-the-art technology are coded 1, 0 otherwise; SIZE = plants that are part of firms with at least 10,000 employees are coded 1, 0 otherwise; LMCOMP = coded 1 when there is thought to be considerable competition in the local labor market for employees, 0 otherwise; NICHE = coded 1 when the plant's production is aimed at a specialty/niche market, 0 otherwise; TECH * SIZE = the product of TECH and SIZE, an interaction term.

In sum, the regression results suggest that firm size dominates the models. That is, of course, a simple story, a story that we tried to push a bit in the interaction model. In principle, regression analysis can consider complicated interaction models; in practice, however, it is often difficult to estimate or interpret such models, especially when the sample size is small. Our inability to consider complicated interaction models puts a cap on the likelihood that the analysis will yield a nuanced portrait of how technology, firm size, niche production, and labor market competition shape labor management practices. That

limitation of the regression analysis is particularly important in light of the complex interaction effects suggested by the interviews.

QUALITATIVE COMPARATIVE ANALYSIS

QCA represents a bridge between the logic of conventional quantitative and qualitative analyses. Like the regression analysis, QCA is multivariate in that it considers how all four variables simultaneously shape labor management strategy.[11] It is also similar to regression in that QCA requires that the analyst preselect and measure variables across all cases, and that all cases are entered into the analysis.[12] QCA differs from conventional quantitative analyses, however, in its much greater emphasis on causal complexity and detailed features of cases. In our view, QCA complements the qualitative and the quantitative analyses by providing (a) a more complex and nuanced portrait than most quantitative analyses and (b) more systematic, methodological discipline than most qualitative analyses. It is not, however, a cost-free substitute for either, a point that we will develop in the concluding section.

Introductory Issues

QCA forces the investigation of complex paths to progressive management. It does not ask about the independent effect of a variable on the likelihood that a plant is progressively managed. Rather, it considers configurations of values on the independent variables as cases. The analysis aims to isolate which cases are progressively managed. Those cases represent the conjunction of casual attributes that produce progressively managed plants. In this way, causation is allowed to be conjunctural, based on the conjunction of variable attributes; it may also be multiple because there may be a number of distinct paths to progressive management (see Ragin 1987, 1989; Drass 1989).

The top panel of Table 4 presents the truth table, the representation of the data for the QCA. Each of the 16 rows in the truth table constitutes a unique configuration of values on the independent variables. The right-most column indicates the outcome of that row. Outcomes labeled *don't care* in this analysis represent logically possible but empirically nonexistent cases. These are found in rows 9, 10, 11, 12, 15, and 16.

TABLE 4: A Qualitative Comparative Analysis of Progressive Management (Truth Table for Causes of Progressive Management)

	Configuration of the Independent Variables					
Row Number	*TECH*	*SIZE*	*LMCOMP*	*NICHE*	N *of Plants*	*Outcome*[a]
1	0	0	0	0	1	0
2	1	0	0	0	1	0
3	0	1	0	0	1	0
4	1	1	0	0	1	1
5	0	0	1	0	3	0
6	1	0	1	0	3	0
7	0	1	1	0	2	1
8	1	1	1	0	3	1
9	0	0	0	1	0	—
10	1	0	0	1	0	—
11	0	1	0	1	0	—
12	1	1	0	1	0	—
13	0	0	1	1	6	0
14	1	0	1	1	1	0
15	0	1	1	1	0	—
16	1	1	1	1	0	—

NOTE: Prime implicant equation for the truth table: Progressive Management = T S n + S L n.
a. Progressively managed = 1; conventionally managed = 0; don't care = —.

Ideally, all plants represented by a row will be PM or CM, but not a mixture of the two. Mixtures, called contradictory outcomes, beg for explanation in QCA rather than relegation to an error vector (Ragin 1987, pp. 113-8). In particular, they suggest that an important factor has been overlooked (much like traditional omitted variable problems) or the possibility of differences across plants in the meaning of a particular variable (like traditional measurement concerns). Contradictory outcomes can also point to the possibility that the dependent variable has been miscategorized: there may, for example, be three important types of labor management practices, not two. In our original truth table, two rows or configurations contained both PM and CM plants: Configuration three had one each; configuration five had two CM plants and one PM plant. We coded both configurations as conventionally managed (scored 0) based on our understanding of the plants represented by these configurations.

An understanding of these decisions sheds light on the way QCA demands a nearly constant interaction between evidence, theory, and method. Both plants in Configuration 3 reported (a) somewhat dated technology, (b) large firm size, (c) little competition in the local labor market for employees, and (d) the absence of a niche production strategy. What is striking about these two plants, however, is their relationships to their respective labor markets. One plant, Plant 9, is located in a small town; it is virtual monopsony in the local labor market because it is the town's major employer. Few other firms compete directly for locals seeking to work in town. Further, its hiring standards are not stringent. It therefore has little trouble with labor supply. Plant 3, in contrast, is located just outside one of the region's larger cities, and actually faces reasonably stiff competition with other employers for labor. Another plant is located in the same area as Plant 3; interestingly, the manager of that plant claimed that they faced a lot of competition in the local labor market. Plant 3, in fact, confronts the same pressures, but relieves them in a proactive way by paying above-average wages: "We've had to pay that higher rate to attract people because there are so many companies in this area that's been hiring people lately" (personnel manager, Plant 3). Those wages turn Plant 3 into a favored employer—and one that reports a surplus of job applicants—not unlike the monopsonistic Plant 9. Management strategies thus shape the environment just as the environment shapes management strategies, a point made by nearly all who discuss organizational environments.

Were it not for the proactive wage policy of Plant 3, it would face substantial competition in the local labor market. For the construction of the truth table, we coded Plant 3 as 1 on LMCOMP instead of 0, thus moving it entirely out of Configuration 3 and into Configuration 7. Another PM plant shares that configuration, and the two plants are remarkably similar.

Configuration 5 also produced a contradictory outcome. This configuration includes three plants, two CM and one PM. The PM plant is distinctive in that it is owned by a foreign company quite active in its management and operations. Its personnel manager said that the plant's personnel practices were a direct consequence of its European ownership. Although the plant is in fact part of a relatively small firm, its international affiliation causes it to manage its workforce as if it

were part of a larger, American-owned plant. But for its small firm size, this plant would fall into Configuration 7, a configuration discussed in reference to the other contradictory outcome. We thus consider Configuration 5 to produce a CM outcome; the other two plants are solidly CM, and the one PM plant is much akin to the two PM plants we now have in Configuration 7.[13]

We resolved the two contradictory outcomes by reexamining the data, asking in particular whether similarly coded plants were, in fact, similar or dissimilar. Like traditional quantitative analysis, QCA leans on variables defined across all cases. Unlike traditional quantitative analysis, QCA encourages the analyst to (a) draw on other aspects of cases when thinking through the meaning and coding of variables and (b) take initial coding decisions as a starting point for a continued dialogue between ideas and evidence.[14]

QCA Results

An inspection of the truth table in Table 4 reveals that there are three different configurations of values on the independent variables that are linked with the occurrence of progressive management. In Ragin's (1987) QCA notation, where an uppercase letter indicates the presence of the attribute and a lowercase letter indicates absence, the three configurations are as follows:

[1] T S l n
[2] t S L n
[3] T S L n.

The prime implicant equation is driven by a desire to simplify these three terms to their components that are logically necessary and/or sufficient. In this analysis, there are two steps. First, terms [1] and [3] reveal only one difference: In [1] labor market competition is weak; in [3] it is strong. Because both configurations are linked to progressive management, labor market competition is not a logically necessary factor given the particular configuration of the other variables. Configurations [1] and [3] can thus be reduced and rewritten as,

[4] T S n,

by dropping the term for labor market competition. Second, a comparison of terms [2] and [3] shows that they differ only in the presence or absence of advanced technology. Technology thus cannot be a logically necessary factor behind progressive management. Terms [2] and [3] can be simplified to

[5] S L n.

The two terms in the prime implicant equation are joined by a plus sign in Table 4. That sign indicates multiple causation: Both configurations of values on the independent variables are linked to progressive management. The logic of QCA places equal weight on the two terms even though four plants are represented by the second term and only one by the first.

In substantive terms, the results are both alike and distinct from those in Table 3. Because firm size appears in both terms, it is a logically necessary factor in progressive management. Unlike the correlation-based results, however, firm size does not emerge as the single, dominating factor linked to progressive management. Because both configurations contain three variable states, incorporation into large firms is a necessary but not logically sufficient attribute to yield progressive management. In the first term, large firm size produces progressive management only in conjunction with the presence of advanced technology and the absence of niche production. In the second term, large firm size must be combined with both the presence of keen labor market competition and the absence of niche production. Note also that the absence of niche production is common to both terms in the prime implicant equation. Like large firm size, then, the absence of niche production is a logically necessary feature of progressively managed plants. It is not logically sufficient, however, in the same way that large firm size alone is not adequate to produce progressive management.

Although both the regression and QCA analyses focus on the same four independent variables, the two sets of results are quite different. The initial premise of QCA is that independent effects are unlikely to be the whole story—or even particularly interesting. Recall that the qualitative analysis strongly suggested that the impact of technology, for example, depended on the context in which it was introduced. The

logic of regression analysis does not encourage this kind of context-specific argument; models with second- or higher-order interaction terms quickly get out of hand. Given our small sample and the strength of the associations, we were simply unable to consider an interaction term based on technology, size, and production strategies, although that is exactly what the qualitative analysis called for. We found that the simple, yet suggestive, interaction of firm size and technology had a large and positive impact.

We believe that the QCA, in overcoming some of the logical and practical constraints of conventional regression models, leads to more provocative conclusions. A plant may need to be part of a large firm to follow progressive labor management practices; large firm size, however, does not appear to be sufficient to produce these practices, because the QCA suggests that a second factor, having a multiple-segment production strategy (the opposite of niche production), is also a necessary attribute of progressively managed plants. Further, these two factors must be combined with one of the two additional factors, the presence of advanced technology or keen competition for employees in the local labor market, to yield the progressive-management outcome. Conclusions of this sort fit in very nicely indeed with a branch of organizational theory that emphasizes contingencies, or how the effects of various workplace and organizational attributes on outcomes depend on the particular contexts in which they are embedded (e.g., Form, Kaufman, Parcel, and Wallace 1988; Kelley 1990).

CONCLUSION

Qualitative analysis revealed the presence of two distinct labor management strategies in the southern textile industry. We characterized one as progressive and the other as conventional. The distinction between PM and CM plants that emerged during the course of our interviews was further reinforced by the results of a principal-components factor analysis of the four primary indicators—educational requirements for new hires, internal labor markets, employee involvement programs, and payment by the hour—of progressive labor management. Our qualitative coding of labor management prac-

tices thus converges with a formal statistical procedure that does, in a different fashion, much the same task.

Next we turned to the question of why a progressive management approach had emerged in some textile plants. We presented three forms of analysis, traditional qualitative, quantitative, and qualitative comparative analysis. Our purpose was threefold: (a) to compare the differing logics of the three methodologies; (b) to show how they differed in practice as we used them to probe a particular substantive problem; and (c) to consider QCA as a possible bridge between the traditional qualitative and quantitative approaches.

Our results suggest that QCA offers a significant contribution to data analysis. It avoids some of the constraints of the techniques in common use today. Unlike traditional qualitative analysis, it compels both a consideration of theoretical stories that may have been overlooked by the sifting-through-the-data approach and a systematic, replicable approach to data analysis. Unlike conventional regression analysis it not only encourages but forces the researcher to consider the context in which specific causal relationships will hold. The contradictory outcomes highlighted by QCA force the researcher to think very hard about cases, measurements of variables, and the meaning of particular case attributes in a way that is not required by either traditional qualitative or quantitative analysis. QCA does not simply take variables and analyze them. QCA requires that the analyst preselect and code variables; those decisions, however, are but the starting point of a dialogue between QCA, the evidence, and the analyst.

On the basis of these results, should we conclude that QCA can bridge the gap between the qualitative and quantitative approaches? Our answer is yes, with some qualifications. In our view, QCA brings some of the methodological discipline and rigor of quantitative analysis to qualitative analysis and some of the causal complexity and inductive sensitivity of qualitative analysis to quantitative analysis, but it also omits some of the strengths of both of those approaches. As a bridge, QCA is almost certain to leave aspects of qualitative and quantitative methodologies on the banks. The question, however, is what is left behind, and whether it can be abandoned without cost.

Consider just a few issues, first from the standpoint of qualitative analysis, then from the standpoint of traditional quantitative analysis. As we see it, QCA stretches to the point of possible compromise two

important aspects of traditional qualitative analysis. First, QCA requires that the analyst determine and measure the relevant causal forces across all cases before QCA can begin in earnest. Variables need to be in hand before the truth table can be constructed. Problems can, of course, surface during the construction of the truth table, leading the analyst to rethink the selection and measurement of variables before any of the key results (e.g., the prime implicants) of QCA are produced. In that sense, QCA encourages what might be called an interactive rather than a batch mode of analysis; variables, however, need to be selected and measured prior to each iteration. What this means is that the highly inductive character of much qualitative research is either replaced by the more deductive approach of QCA or, more appropriately, QCA becomes a secondary line of analysis once an inductive, qualitative analysis is in hand.

Aside from the relative roles of inductive and deductive thinking (which is surely not completely absent from good qualitative analysis), this first issue underscores the importance of variables in QCA. Our ability to define and measure variables rests on the assumption that we can abstract, in a radically analytic fashion, particular attributes of a case in a way that does not depend on other attributes of the case. QCA presumes that the causal roles of variables are intertwined; measurement, however, can be done for each variable for each case without much concern for the overall configuration of the variable values or the case's properties as a whole. To the extent that qualitative researchers think in terms of variables, those variables tend to be conceived in a much less radically analytic fashion than is required by QCA. QCA does, in fact, require analysts to think of cases as wholes, a point we note in our discussion of contradictory outcomes. Traditional qualitative analysis, however, gives more attention to cases as wholes than QCA can readily accommodate with its more variable-centered approach.

A second main point of contrast hinges on the notion of causality in much qualitative work and in QCA. QCA is like qualitative analysis in that it avoids speaking about causation in probabilistic terms. Variables do not increase or decrease the likelihood of an event or outcome; rather, both QCA and qualitative analysis seek to uncover the attributes or circumstances that actually lead to a particular event or outcome. Despite that similarity, the two types of analysis differ in

what constitutes a satisfactory explanation of an outcome or event. For example, our qualitative analysis suggested that ideas about how to manage a workforce interacted with corporate size and prominence to produce the PM outcome; further, attributes of a case that cannot readily be measured (or measured identically) across all cases (e.g., a chief executive's leisure-time reading) figured prominently in our explanation of why a particular plant was progressively managed. In other words, the qualitative explanation allowed us to get at questions of timing and immediate causality and to bring them to the forefront of the analysis. In contrast, explanation in QCA is much more oriented toward general, systematic factors.

Turning next to quantitative analysis, we find that two key aspects of this approach play very little, if any, role in QCA. First, conventional quantitative work makes much of the idea that we need to be very cautious in moving from an analysis of any given body of data to statements about the population from which our sample was drawn. Extensive work on sampling, sampling distributions, and ideas like the central-limit theorem form the bedrock that grounds traditional quantitative inference. Of course, in practice we often have very complex samples and various assumptions of our methods are not met, leaving our parameter estimates and statistical inferences less certain than we would like them to be. Nonetheless, concern about sampling variability generally tempers statements about the results of any given analysis.

In QCA, the idea of sampling variability lacks a formal role in the analysis and interpretation of the results. Most sociological analyses—quantitative and qualitative—rest on a subset of all possible cases, a fact that raises questions about the relationship between the results based on a given sample and those based on other samples or on the whole population. Unless advocates of QCA can develop something akin to an analogue of the central-limit theorem for prime implicants, QCA is vulnerable to the charge that it capitalizes on chance and may well produce wildly different results across samples, two concerns of traditional quantitative analysis.

A second notable difference between QCA and traditional quantitative analysis centers on what is included in the data that is analyzed. The 22 textile plants we observed constitute the cases for a traditional quantitative analysis. Analysis thus involves the consideration of actual plants and their various observed attributes. In QCA, our data

on the textile plants are used to create a truth table, which is essentially a cross-classification of all independent variables in the analysis. The logically possible configurations of the independent variables become the cases that enter the analysis. Some of these logically possible configurations are observed and thus reflect particular textile plants; some configurations are not observed. Both, however, enter the QCA, and the results that are obtained can depend on how the analyst treats the logically possible but unobserved configurations or cases. Our tact was to treat those cases as "don't cares" in the analysis. That decision then allowed the QCA algorithm to treat these cases as either PM or CM: If they help to produce a more minimal solution, they are coded as PM; if not, they are coded as CM (Ragin 1987, p. 116). In fact, we obtain the same prime implicants when we code all of the logically possible but unobserved cases as CM. Our analysis shows which causal combinations are unambiguously associated with progressive management.[15] Data analysis in QCA is thus based on a mix of observed data and assumptions about the outcomes (in our case, PM or CM) of logically possible but unobserved cases. Although that strategy allows us to consider social phenomena with limited diversity, it blends data and theoretical conjecture together under the rubric of data analysis in a way that differs rather dramatically from both traditional qualitative and quantitative analysis.[16]

In sum, it would be reckless to claim that QCA is a substitute for either traditional approach, qualitative or quantitative. We argue that it represents a powerful complement to those two approaches. It does not merely add to the data analyses that these other methods produce, however; instead, QCA digs much deeper, bringing to the surface vital issues of data categorization, variable measurement, and causal assertion that too often are left unexamined. If one believes, as we do, that good explanations are ones that stay close to the data, then QCA merits serious consideration.

NOTES

1. One plant was so new that the manager's discussion of labor management practices was nearly always hypothetical in nature. We omit that case from the analysis, leaving an effective sample size of 22 plants.

2. The point of the quantitative analysis is to show basic patterns of association. We are well aware of the fact that distribution and measurement assumptions underlying the use of correlations and correlation-based multivariate techniques are not met with the data at hand. We believe that the analyses are substantively informative even though they certainly provide estimates that are less than definitive. In a similar vein, the data are not a product of simple random sampling, a fact that leaves standard errors and significance tests quite suspect.

3. We attempted to fit the unrestricted latent class model described by Goodman (1978, pp. 287-93) with Clogg's (1977; the program version date is 1987) MLLSA program. Of the 16 cells ($2 \times 2 \times 2 \times 2$) in the observed table, 9 have frequencies of zero—sampling zeros—because of the relatively small sample size and the strength of the association between the variables. This left the program unable to estimate two of the nine parameters.

4. In our discussion we are glossing over the distinction that Glaser and Strauss draw between the constant comparative method and analytic induction. They suggest that analytic induction, although similar to the constant comparative method in many respects, differs in that it demands hypothesis testing using all available data. We think the difference is less salient than they suggest.

5. Some qualitative purists might question the usefulness of a summary label such as *progressive management*, let alone any attempt to construct an explanation of it. We assume that categorization of similar phenomena under a single heading is worthwhile, as is a theoretical explanation of the category.

6. We should emphasize that we are speaking in general terms here because any given study may not have all of these strengths (or weaknesses).

7. A strict analytic inductivist would probably disagree, but we feel that our discussion is an accurate representation of most qualitative analysis.

8. Labor market competition was not identified as a causal factor at the time of the initial qualitative analysis. We included it in the quantitative and qualitative comparative analyses because it seemed like a potentially salient aspect of the "environment" that we had overlooked in the qualitative analysis. The variable thus stems from a method of analysis that is more oriented toward theory testing than theory building.

9. The categorization relies on interview evidence and *Clark's Directory of Southern Textile Mills* (Clark Publishers 1989). The directory lists the products made and equipment used in every textile plant in the southeast. We use both sources because the interviews often produced sketchy descriptions of the machinery used in the plants.

10. We also estimated a more technically appropriate logistic regression model but found that the sampling zeros produced odd results. Most of the coefficients were in excess of 10; the standard errors were over 100. As a linear probability model, our OLS coefficients produce predicted values that fall outside of the [0, 1] range for three cases (those predicted values are −.02, −.06, and −.08). We present the OLS results because we believe that they provide sensible—although obviously imperfect—substantive guidance.

Analyses using the factor score as the dependent variable produce much the same pattern of results. We present the results that lean on the dichotomous dependent variable because they are more directly comparable to the QCA results presented later.

11. There is nothing in the logic of QCA that forces us to use the same variables that appeared in the quantitative analysis. We used the same four variables because they (a) represent our best guess as to the causal forces involved and (b) allow us to directly compare the logic and results of QCA and the quantitative analysis.

12. The term *preselect* needs some elaboration. There is nothing in the logic of quantitative analysis that prevents the analyst from considering a variety of model specifications. Because results and further substantive reflection can suggest additional variables or measurements, preselection need not imply an early stage of a strictly linear thought process. The idea of preselection is simply that variables need to be selected and measured before parameters can be estimated. QCA is much the same as quantitative analysis in that the analyst must identify and measure variables across all cases before QCA's most distinctive results—the "prime implicants"—can be produced. As we describe later, the construction of the truth table is the first key operation in QCA after variables are selected and measured. Difficulties in constructing the truth table, however, point to the need to rethink variable selection and measurement. QCA's requirement that the analyst preselect variables is thus very much like that for traditional quantitative analysis.

13. Only one other plant (a CM plant) has a foreign owner. That owner is not active in the management or operations of the plant. The activism of the foreign owner—not foreign ownership per se—thus appears key to the shifting meaning of firm size.

Because measurement issues can be consequential for the general story suggested by the analysis, we also explored the possibility of coding Configurations 3 and 5 as "don't care." That strategy treats configurations with contradictory outcomes in the same way as configurations that are logically possible but unobserved. In our case, the results remain exactly the same.

14. In our initial analysis of the contradictory outcomes, we also considered the possibility that we had miscoded the labor management strategies of one or more of the plants in Configurations 3 and 5 (in Table 4). Ragin (1987) argues that contradictory outcomes might suggest the presence of additional types of labor management practices. Both configurations that produce contradictory outcomes involve plants that were not "pure" cases of PM or CM in Table 1. Plants 3 and 9, for example, are both "nonpure" cases in Table 1, a fact that immediately suggested the possibility that we had overlooked some form of hybrid management strategy. This possibility threw us back into another analysis of the PM/CM distinction and whether the cases that produced contradictory outcomes in the truth table were like the other PM and CM plants. Our conclusion was that the plants that prompted the contradictory outcomes were, in fact, best understood as either PM or CM, not some third hybrid form. QCA, however, forced us to rethink the PM/CM distinction, and is thus more integrated with the creation of the labor management typology than is evident from our discussion.

15. QCA can provide explicit statements about casual combinations that do not exist, thus establishing what Ragin (1987, p. 109) calls the "substantive boundaries" of the analysis of the causes of progressive management. We did not do that here because the results do not shed much light on the main themes of our discussion.

16. Empty-cell problems also surface in quantitative analyses. Our sense is that in most quantitative studies, empty-cell issues tend to be interpreted as technical, not theoretical, problems and invite technical solutions rather than substantive speculation.

REFERENCES

Adler, Paul. 1986. "New Technology, New Skills." *California Management Review* 29:9-28.

Arthur, Jeffrey B. 1992. "The Link between Business Strategy and Industrial Relations Systems in American Steel Minimills." *Industrial and Labor Relations Review* 45:488-506.

Bell, Daniel. 1973. *The Coming of Post-Industrial Society*. New York: Basic Books.

Blauner, Robert. 1964. *Alienation and Freedom: The Factory Worker and His Industry*. Chicago: University of Chicago Press.

Bonham, Julia C. 1991. "Robotics, Electronics, and the American Textile Industry." Pp. 163-80 in *Hanging by a Thread: Social Change in Southern Textiles*, edited by J. Leiter, M. Schulman, and R. Zingraff. Ithaca, NY: ILR Press.

Burawoy, Michael. 1991a. "The Extended Case Method." Pp. 271-87 in *Ethnography Unbound: Power and Resistance in the Modern Metropolis*, edited by M. Burawoy, A. Burton, A. A. Ferguson, K. J. Fox, J. Gamson, N. Gartrell, L. Hurst, C. Kurzman, L. Salzinger, J. Schiffman, and S. Ui. Berkeley: University of California Press.

———. 1991b. "Reconstructing Social Theories." Pp. 8-27 in *Ethnography Unbound: Power and Resistance in the Modern Metropolis*, edited by M. Burawoy, A. Burton, A. A. Ferguson, K. J. Fox, J. Gamson, N. Gartrell, L. Hurst, C. Kurzman, L. Salzinger, J. Schiffman, and S. Ui. Berkeley: University of California Press.

Chandler, Alfred D., Jr. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: Harvard University Press.

Clark Publishers. 1989. *Clark's Directory of Southern Textile Mills*. Greenville, SC: Clark Publishing.

Clogg, Clifford C. 1977. "Unrestricted and Restricted Maximum Likelihood Latent Structure Analysis: A Manual for Users." Working Paper No. 1977-09, Pennsylvania State University, Population Issues Research Office.

Crosby, Philip B. 1979. *Quality Is Free: The Art of Making Quality Certain*. New York: McGraw-Hill.

DiMaggio, Paul J. and Walter W. Powell. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48:147-60.

Dobrish, Cecelia, Rick Wolff, and Brian Zevnik. 1984. *Hiring the Right Person for the Right Job*. New York: Franklin Watts.

Drass, Kriss. 1989. "QCA 2.02: Qualitative Comparative Analysis." Dallas, TX: Southern Methodist University, Department of Sociology [Mimeograph].

Edwards, Richard. 1979. *Contested Terrain: The Transformation of the Workplace in the Twentieth Century*. New York: Basic Books.

Florida, Richard and Martin Kenney. 1991. "Transplanted Organizations: The Transfer of Japanese Industrial Organization to the U.S." *American Sociological Review* 56:381-98.

Fogel, Robert William and G. R. Elton. 1983. *Which Road to the Past? Two Views of History*. New Haven: Yale University Press.

Form, William, Robert L. Kaufman, Toby L. Parcel, and Michael Wallace. 1988. "The Impact of Technology on Work Organization and Work Outcomes." Pp. 303-28 in *Industries, Firms, and Jobs: Sociological and Economic Approaches*, edited by G. Farkas and P. England. New York: Plenum.

Glaser, Barney G. and Anselm L. Strauss. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine.

Goodman, Leo A. 1978. *Analyzing Qualitative/Categorical Data: Log-Linear Models and Latent Structure Analysis*. Lanham, MD: Abt Associates.

Isaac, Larry W. and Larry J. Griffin. 1989. "Ahistoricism in Time-Series Analyses of Historical Process: Critique, Redirection, and Illustrations From U.S. Labor History." *American Sociological Review* 54:873-90.

Jacoby, Sanford M. 1985. *Employing Bureaucracy*. New York: Columbia University Press.

Kelley, Maryellen R. 1990. "New Process Technology, Job Design, and Work Organization: A Contingency Model." *American Sociological Review* 55:191-208.

Leiter, Jeffrey. 1982. "Continuity and Change in the Legitimation of Authority in Southern Mill Towns." *Social Problems* 29:540-50.

Leiter, Jeffrey, Michael D. Schulman, and Rhonda Zingraff, eds. 1991. *Hanging by a Thread: Social Change in Southern Textiles*. Ithaca, NY: ILR Press.

Lofland, John and Lyn H. Lofland. 1984. *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. Belmont, CA: Wadsworth.

Pfeffer, Jeffrey and Yinon Cohen. 1984. "Determinants of Internal Labor Markets in Organizations." *Administrative Science Quarterly* 29:550-72.

Porter, Michael E. 1980. *Competitive Strategy*. New York: Free Press.

———. 1985. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.

Ragin, Charles C. 1987. *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press.

———. 1989. "The Logic of the Comparative Method and the Algebra of Logic." *Journal of Quantitative Anthropology* 1:373-98.

———. 1991. "The Problem of Balancing Discourse on Cases and Variables in Comparative Social Science." Pp. 1-8 in *Issues and Variables in Comparative Social Research*, edited by C. Ragin. Leiden, Netherlands: E. J. Brill.

Van Maanen, John. 1988. *Tales of the Field: On Writing Ethnography*. Chicago: University of Chicago Press.

Zicklin, Gilbert. 1987. "Numerical Control Machining and the Issue of Deskilling: An Empirical View." *Work and Occupations* 14:452-66.

Zuboff, Shoshana. 1988. *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

James E. Coverdill is an assistant professor of sociology at the University of Georgia. He is currently pursuing two main lines of research. The first focuses on the roles of informal and formal intermediaries in the labor market, often called personal contacts and headhunters or recruiters. The study of recruiters is just underway and will involve a mix of qualitative and quantitative analyses. The second line of research focuses on relationships between White ethnic identification and racial attitudes in the United States.

William Finlay is an associate professor of sociology and a fellow in the Institute for Behavioral Research at the University of Georgia. His current writing examines hiring decisions in the electrical and textile industries. In collaboration with James E. Coverdill, he has begun a new research project on recruiters. He is the author of Work on the Waterfront: Worker Power and Technological Change in a West Coast Port *(Temple, 1988) and "Culture as Control: Work and Self in Modern Organizations," in* Qualitative Sociology *(1993).*

Jack K. Martin is an associate research scientist and the director of the Survey Research Center at the University of Georgia. He is also an adjunct associate professor in the Department of sociology. His research focuses on the interaction of workplace structures and worker dispositions as this process influences behaviors at work and off the job. Recent publications include "Black-White Differences in Job Values Revisited" in Social Science Quarterly *(with Steven Tuch); "Drinking to Cope and Self-Medication: Characteristics of Jobs in Relation to Workers' Drinking Behaviors" in the* Journal of Organizational Behavior *(with Paul Roman and Terry Blum); and "Race in the Workplace: Black-White Differences the Sources of Job Satisfaction" in* Sociological Quarterly *(with Steven Tuch).*