The Concept of Skill : A Critical Review

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The concept of "skill" provides the linchpin for many debates on work. Yet occupational sociologists have seldom thought to ask what the concept means. This article reviews the literature and develops critical observations on skill research. Although recent theorists have tended to dismiss deskilling theory, the research findings remain equivocal. Despite their inability to measure compositional shifts in skill, case studies continue to play an important function. New lines of inquiry have emerged, indicating a growing consciousness of the limitations of the dominant theories of skill. Absent greater rigor in the study of skill, policy debates will proceed without a sociological contribution.

The Concept of Skill

A CRITICAL REVIEW

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The concept of skill has played a pivotal role in research on work and social inequality, beginning with the Davis and Moore theory of stratification and extending to arguments about the divisions within the working class, maps of the class structure, as well as debates over new technology and gender disparities in pay. In spite of its centrality, few researchers have systematically explored what skill actually means, how we might measure it, and whether it comprises "a necessary input to the efficient production of goods" or instead, "a social artifact that comes into being through the artificial delimitation of certain work as 'skilled' " (More, 1982, p. 109). The result is plain for all to see. Because researchers have used widely varying conceptions and measures of skill, the empirical literature is rife with inconsistent and contradictory findings that point in several directions at once. More than academic nuances are at stake, for skill research can have massive implications for public policies, as seems implied by the comparable

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worth literature, issues of equal opportunity, and the continuing debate on American schooling and vocational requirements. The growth of our knowledge about skill is unlikely to occur until we clarify the concept, reflect on the assumptions that underlie theories of skill, and subject conventional research strategies to closer scrutiny than they have received.

The questions that we must pose are at once theoretical, methodological, and practical in nature. What *is* skill? Can a single definition apply across varying contexts and phases in the development of capitalism? What role do politics and ideology play in the perception and evaluation of work content? Does the selection of one or another method prejudice our findings? In this essay, I propose to critically review existing theories of work and skill, examine the major research methods and findings, and identify analytic paths that seem especially promising.

THE CONTINUING DEBATE OVER SKILL REQUIREMENTS

When educational psychologists and human capital theorists use the concept of skill, they typically have in mind the properties of the worker rather than of the job. Often, researchers in such disciplines employ skill as an independent variable, as when they predict variations in wage levels. For sociologists concerned with skill, however, these priorities are usually reversed. Reflecting our greater concern with work structures, most sociological research on skill centers on the requirements of jobs. With important exceptions, sociologists typically view skill as a *dependent* variable, as when we attempt to explain variations in the level of skill within occupations, firms, or economies over time.

The great majority of studies have been concerned with the consequences of technological change for the skill content of work. Although there has been some shifting of theoretical boundaries in recent years, it is fair to say that two perspectives have dominated the literature.[1] On one hand are varying formulations of an upgrading perspective, originally articulated by Blauner (1964) and others, and which continue to inform current research (Adler, 1986; Hirschhorn, 1984; Zuboff, 1988). On the other hand are theories of occupational downgrading or deskilling, most forcefully stated by Braverman (1974, 1975), which have received widespread discussion in both the United States and Great Britain (see Form, 1987; Knights & Wilmott, 1990; Thompson, 1989, 1990; Wood, 1989). Although there are important variations within each theoretical camp, the essential claims and assumptions of each perspective can be outlined in the following terms.

Upgrading theories tend to embrace a technologically determinist point of view which sees the development of production technique as the major influence shaping task design. Adherents tend to see the rise of automated work processes as signaling a qualitative break with earlier trends in skill requirements, leading us "beyond mechanization" into "post-hierarchical" or even "post-capitalist" work processes. For such theorists, the coming of automation promises to free workers from the constraints of machine-paced work, enlarging their control over the immediate work environment. Increasingly, workers can (indeed, must) envision the totality of the production process in order to oversee and control it. Finally, employment in technologically advanced firms enables workers to form closer and more collegial ties with supervisors, engineers, and technicians, resulting in more cooperative relations between management and workers than has prevailed under earlier stages of capitalism.[2]

Deskilling theorists dispute each of these assertions. Although some have viewed Braverman (1974) and allied theorists as technological determinists (see Kelley, 1990, p. 192), careful reading suggests otherwise. Indeed, deskilling theorists typically seek to *debunk* notions of technological determinism and are nearly unanimous in asserting that social relations shape workplace technology rather than the reverse. Following Winner's (1980, 1987) thesis that "artifacts have politics," studies by Noble (1979) and Wilkinson (1983) claim to show how certain types of machine designs demonstrably embody managerial inclinations (cf. Gorz, 1972; Kraft, 1979).

In further contrast with the upgrading school, deskilling theorists perceive a direct line of *continuity* between mass production processes and their newer, automated equivalents. Indeed, a central claim of deskilling studies is that information technologies actually deepen the subordination of workers to the dictates of their employers, in that they enable management to remove whatever technical intelligence remains in the workers' grasp. Seeking to translate workers' productive capacity into the maximum amount of labor actually performed, management is forced to loosen workers' grip on technical knowledge and expertise, which had provided a critical means of resisting managerial controls. What therefore emerges is a sharpening division between the labor of conception (or planning) and execution (doing). At its core, the argument implies that the accumulation of capital gives rise to a relentless, if empirically uneven, trend toward the homogenization and degradation of labor.

Beginning in the late 1970s, deskilling theory began to dominate discussions of skill and work process. As the debate unfolded, however, the theory's limitations became increasingly apparent. The theory ignores the effects that

workers' resistance has on the distribution of skill, thereby overestimating the triumph of Taylorism (Palmer, 1975; Stark, 1980; Wilkinson, 1983). So concerned is the theory with scientific management that it fails to observe the rise of *non*-Taylorist systems of labor control, such as "responsible autonomy" (Friedman, 1977), "bureaucratic control" (Edwards, 1975, 1979), as well as "hegemonic" regimes that elicit workers' consent (Burawoy, 1983, 1985; Littler & Salaman, 1982). Finally, the theory tends to idealize craft labor, exaggerating its prevalence in earlier periods and ignoring the exclusive and sectionalist politics that often underlie it (Form, 1980; Monds, 1976; Stark, 1980). These and other criticisms have been amply registered elsewhere and need not be recounted here (see the discussions in Attewell, 1987a, 1987b; Knights & Wilmott, 1990; Thompson, 1989; Wood, 1982). How have scholars responded to this cumulative critique?

Some authors sought to reformulate the theory, overcoming its weaknesses and giving rise to a heterogenous body of analysis that scholars have begun to call "labor process theory" (Knights & Wilmott, 1990). Essentially, writers in this genre retained important assumptions that underlie Marxist and to some extent neo-Weberian analysis, yet without remaining wedded to the specific premises of deskilling theory. Addressing the problem of human agency that has plagued deskilling theory, researchers explored the ways in which shopfloor politics and industrial relations systems influence the distribution of skill within firms and industries (Hyman & Streeck, 1988; Penn, 1982; Wilkinson 1983). Of particular importance has been a continuing effort to identify the varied forms that managerial control over labor has assumed, together with the historical conditions that gave rise to each (Burawoy, 1985; Friedman, 1990; Thompson, 1989, 1990).

Other writers adopted a "contingency" approach toward skill changes that is agnostic on the question of overall historical processes. As Wood (1982) puts it, "the quest for general trends, such as progressive deskilling of the work force, or general conclusions about the impact of new technologies, are likely to be both theoretically and practically in vain" (p. 18). Hence contingency theorists set themselves the task of identifying the conditions that mediate the outcome of job redesign (Kelley, 1990), commonly focusing on such factors as the location of the firm within the economic core or periphery (Form, Kauffman, Parcel, & Wallace, 1988), the presence of labor unions and seniority systems (Cornfield, 1987; cf. Kelley, 1990), as well as patterns of conflict and cooperation within the firm (Child, Loveridge, Harvey, & Spencer, 1984; Wilkinson, 1983).

Still others questioned the wisdom of labor process theory. Thus Storey (1985, p. 194) argued that "it is perhaps not an exaggeration to say that the

labour process bandwagon has run into the sand," and has now been "holed and patched beyond further repair." Such disillusionment rests not merely on theoretical criticism: It reflects a widely shared belief that the substantive findings of skill research show little or no support for the major empirical claims that labor process theories have advanced. For example, Adler (1988) concluded that the literature on skill requirements has dealt a "resounding rejection" to the theory of deskilling: "Not one of the systematic, aggregate studies . . . shows a deskilling trend, and most show a clear upgrading" (p. 3). For Adler, the reason why deskilling theory has retained its attraction "for so long by so many in the face of so much data that apparently contradict it" (p. 6; cf. Form, 1986) rests purely on its polemical appeal.

Review of the research findings suggests, however, that the case against deskilling theory is far more equivocal than many have presumed. Critical problems of conceptualization and measurement continue to hinder our ability to make strong inferences about changes in skill levels, and the linkage between empirical studies and the theories they purport to test has often been weak. Before we interpret the evidence as reliably refuting deskilling theory —and certainly, before we call for the abandonment of labor process theory writ large—closer attention must be paid to the methods used in skill research.

RESEARCH STRATEGIES IN THE STUDY OF SKILL

Empirical studies of skill requirements divide into three distinct groups. The first includes quantitative studies that use nationally representative data to measure changes in aggregate skill requirements over time. The most well-known studies in this group rely on the *Dictionary of Occupational Titles* (*DOT*; Spenner, 1979, 1983, this issue), although other strategies have also been applied.[3] The second includes quantitative studies with samples that are more spatially restricted than the first group, such as nationwide data on single industries, regionally delimited data on a variety of industries, or some combination of the two (Hull, Friedman, & Rodgers, 1982; Kalleberg & Leicht, 1986; Kelley, 1990; Vallas, 1987, 1988; Wallace & Kalleberg, 1982). The third group includes qualitative studies that explore changes in particular occupations or firms over time (Cockburn, 1983; Cornfield, 1987; Halle, 1984; Hirchhorn, 1984; Kraft, 1979; Noble, 1984; Wilkinson, 1983; Zuboff, 1988).

The aggregate strategy has had the most pronounced effect on the debate: In fact, the "resounding rejection" of deskilling theory that Adler perceived rests entirely on aggregate designs. This is not the place to develop

a comprehensive critique of aggregate research (see Spenner and Attewell in this issue). It must suffice to observe that serious problems continue to handicap aggregate studies, particularly those based on the *DOT*, and that we draw strong inferences from them only at great peril.

AGGREGATE DESIGNS

In his comprehensive assessment of the literature on skill, Spenner (1983) pointed toward several dangers that confront aggregate research (see also Cain & Treiman, 1981) and identified three major threats to the validity of studies based on the *DOT*. First, skill ratings across different editions were not independent of one another: Earlier scores prejudiced later ratings. Second, it remains unclear whether *DOT* experts scored the actual content of the job titles or were influenced by their prestige (Spenner, 1983, p. 830). Third and finally, new occupations were poorly represented in the *DOT's* sampling of job titles, which means that "the *DOT* probably underestimates the true change in job content" (Spenner, 1983, p. 830). Given that the most rapidly growing mass occupations are low-paying service jobs (Bellin & Miller, in press; Bluestone & Harrison, 1986) it seems plausible to assume that the *DOT* estimates of skill changes are biased in the direction of upgrading. These and other problems raise serious doubts about the validity of the *DOT* measures, which researchers have only now begun to sort out (see Spenner, this issue).

These problems do not exhaust the pitfalls of research based on the *DOT*. Beginning with Bright's (1966, pp. 209-210) enumeration of 12 distinct facets of the worker's contribution to the production process, researchers have grown increasingly aware of the need for multidimensional constructs of skill. Building on Spenner's (1983) seminal analysis of two core dimensions of skill—occupational complexity and autonomy-control—researchers have added further dimensions to his approach. Thus Kelley (1988) developed a three-dimensional model that assesses jobs in terms of breadth, conceptual demands, and the responsibility required for the execution of tasks. Adler (1988) went further, distinguishing four dimensions in the study of skill, several of which address the qualitative facets of skill rather than just its quantitative level or degree. Despite increasing recognition of the need for nuanced, multidimensional conceptions of skill, the *DOT* measures are largely restricted to a single dimension of skill (i.e., complexity) with virtually no attention given to such theoretically decisive dimensions as autonomy-control, discretion, responsibility, and other related constructs. Because *DOT* measures fasten on a single aspect of a larger and more

complex phenomenon, studies based on them may well misspecify the nature of changes in work content over time. Such distortion is especially likely if changes in the different dimensions of skill, such as complexity and control, vary in opposite directions simultaneously.[4]

A further limitation in studies based on the *DOT* is their tendency to concentrate on *absolute* changes in skill levels, without examining shifts in the *relative share* of technical knowledge held by particular groups and classes (Armstrong, 1988, pp. 150-51). The issues here run directly parallel to those involved in debates over the absolute and relative emiseration of the working class.[5] Even if the technical competence required in working class occupations were to increase, greater expansion of the knowledge controlled by engineers and other technologists might easily dwarf such increases in workers' skills, yielding a net reduction in the latter group's share of production knowledge and technique. In the absence of firm-level data, however, aggregate research is not likely to detect such relative shifts. In truth, a wide gap exists between aggregate studies of skill and the theory they purport to test.

CASE STUDIES

The need for caution in interpreting aggregate data becomes even clearer when we explore the results of the second and third research strategies involving different forms of case study design.

Much of the literature on the transformation of craft occupations in the machine tools, printing, and metalworking industries *has* revealed an inclination among employers to concentrate technical knowledge and expertise in the hands of managerial or professional employees, much as deskilling theory expects (Cockburn, 1983; Kalleberg, Wallace, Loscocco, Leicht, & Ehm, 1987; Noble, 1984; Penn, 1982; Shaiken, 1984; Wallace & Kalleberg, 1982; Wilkinson, 1983). Such an inclination is not uniformly distributed throughout these industries, however, but varies with the characteristics of particular firms. Thus Kelley's (1990) study of 1,015 plants in 21 metalworking industries found that the tendency to deskill manual workers is clearest in large, multiplant establishments whose workers enjoyed union representation. By contrast, managers in smaller, single-plant establishments were significantly more likely to allow manual workers to program automated machines. Although Kelley's findings provide at least partial support for notions of "flexible specialization," they also demonstrate the prevalence of rigid, centralized uses of new technologies in the commanding heights of the economy.

A related group of studies suggested that where management does seek to remove skill from the workers' domain, realization of this trend depends on such considerations as informal shop floor relations, the strength of trade union organizations as well as local labor market conditions. Thus the craftworkers in Wilkinson's (1983) studies often proved able to subvert management's thrust for control, maintaining important elements of their craft skills. Similarly, the chemical workers in Halle's (1984) study maintained a hidden stock of knowledge about the production process, periodically drawing on it to keep management at bay. Finally, Penn's (1982) historical analysis of skilled metalworkers in Great Britain concluded that "it was the differences in forms of worker organization and resistance during the transition to highly mechanized factory production"—combined with local labor market conditions—"that largely determined whether or not specific groups of workers were skilled" after mechanization was complete (p. 104).

Case studies of white-collar occupations seem too inconsistent to support any clear inferences. Some studies provided evidence of deskilling (Baxter, 1987; Costello, 1985; Crompton & Jones, 1984; Glenn & Feldberg, 1979; Hartmann, Kraut, & Tilly, 1987; Haug, 1977; Vallas, 1987), while others found an upgrading trend (Attewell, 1987a, 1987b; Shepard, 1971). Occasionally, a complex set of outcomes emerged, as in the study by Appelbaum and Albin (1989). They found that some insurance companies adopted a worker-centered strategy of job redesign that upgraded skills, but that others (chiefly the larger firms) adopted an "algorithmic" model of work organization whose goal was to "reduce decision-making as much as possible to a set of self-contained rules . . . implementable by a computer" (p. 252; cf. Zuboff, 1988). Again, the data belie simplistic portrayals in terms of a single master trend.

Obviously, case studies suffer from several characteristic limitations. Their findings cannot easily be generalized beyond the particulars of a single case, and they typically overlook compositional shifts in skill requirements. Yet case studies often compensate for these limitations by focusing on the full range of skill dimensions (including autonomy-control) involved in the debate. They can often identify the social processes that underlie shifts in skill requirements, which might easily elude aggregate research. Finally, the fine-grained analysis that case studies afford can serve to raise important questions about measures of skill that rely on formal sources of data, such as interviews with officials or written job descriptions.

Recall that the workers in Halle's (1984) study amassed practical knowledge about chemical processing that often served as an important lever in their relations with management. Workers' jobs did not require them to

develop such knowledge; indeed, management seemed unaware of its very existence. Yet the fact remains that workers *did* possess considerable practical expertise, and that the actual distribution of skill diverged quite sharply from that which purely formal accounts would provide. Halle's study prompts us to ask whether shop floor realities are, in fact, reflected in formally derived data on skill, and whether organizational processes might introduce important sources of distortion into data gathered at a distance from the shop floor.

Considerations such as this prompted Penn (1982) to conclude: "The real significance of skill within the manual working class cannot be grasped from aggregate data; we must examine the local labour markets and local industrial relations structures where most of the battles over skill are fought" (p. 108). Although this conclusion is surely too extreme, it does point toward the need for a more cautious view of aggregate studies (as Spenner, 1983, originally advised) than researchers have typically assumed.

None of these observations should be viewed as advocating the rehabilitation of deskilling theory. Without doubt, some of the most salient themes in Braverman's (1974) analysis must be jettisoned, for reasons outlined earlier. The danger is that disaffection with the deskilling hypothesis will prompt researchers to discard the concerns of labor process theory more broadly. Clearly, however, there is much in the labor process literature that is of enduring value: its emphasis on the conflictual relations between capital and labor, for example, which give rise to management's chronic problem of control; its effort to link forms of work organization to the prevailing mode of production; and, perhaps most important, its recognition that the distribution of skill rests on relationships that are fundamentally social and political in their nature, rather than simply outgrowths of technical exigencies.

WHERE DO WE GO FROM HERE?

In recent years, theorists have sought to transcend the simple rivalry between deskilling and upgrading perspectives. Increasingly, theorists acknowledge that changes in skill requirements involve far more complex and contradictory processes than can be grasped using such simple dichotomies. Penn (1985) argued, for example, that deskilling and upgrading are not mutually exclusive possibilities but rather conflicting trends that can and often do coexist within the same firm or industry (cf. Penn & Scattergood, 1986). Likewise, DiPrete (1988) developed a theory of "status redefinition,"

which focuses on shifts in organizational hierarchies rather than isolated occupational groups.

Amid such theoretical innovations, three recent developments seem especially important: (a) efforts to understand the conflicting organizational principles that inform the process of workplace automation, as in the work of Zuboff (1988) and others; (b) the growth of comparative perspectives on skill and work structures; and (c) studies in the "social constructionist" vein, which view the definition of skill as a matter of occupational power and ideology.

NEW TECHNOLOGIES AND ORGANIZATIONAL CONTRADICTIONS

Perhaps the most widely popularized attempt to synthesize or transcend conflicting perspectives on work and skill lies in the work of Hirschhorn (1984) and Zuboff (1988). Viewed from one perspective, these authors sought to rejuvenate upgrading theory. From a different vantage point, however, these authors owe at least as much to Marx as to writers such as Bell or Blauner. Indeed, their argument essentially posits a growing contradiction between the forces and relations of production within technologically advanced firms.[6]

This contradiction is most apparent in Zuboff's (1988) account. What is novel in her work is that she attends to *both* the exigencies of new technologies (typically the concern of upgrading theorists) *and* the prevailing structure of managerial power and authority (the natural lair of deskilling theory). In her view, effective use of the new information technologies demands important changes in workers' functions: Increasingly, workers must develop greater conceptual or "intellective" skills, using a wider range of information in their work than ever before. Such trends typically collide against vested organizational interests, however, as managers sense a growing threat to their traditional power and authority.

Rather than viewing skill requirements as shaped by a single trend, theorists such as Zuboff detect the presence of two conflicting principles at work: the logic of technique (which requires that workers enjoy greater access to production knowledge and expertise) and the logic of managerial power (which insists that production knowledge remain the property of an elite). The key issues then become precisely how these organizational contradictions are resolved and which of the conflicting principles is likely to prevail.

Both Hirschhorn and Zuboff assumed that in a context marked by sharpening economic competition, firms must eventually choose the more rational (i.e., profitable) path—the logic of technique. They foresaw a growing integra-

tion of work and learning and a wider transition to organizations that are "post-hierarchical" in their nature. It is possible to raise questions about their conclusion. Neither Hirschhorn nor Zuboff identified social mechanisms or agents that seem capable of insuring the transition to a post-hierarchical workplace. Moreover, it is by no means clear that corporations are likely to adopt innovative forms of work organization at a time of sharpening competition (cf. Noble, 1984). Finally, because both Zuboff and Hirschhorn viewed technology as exogenous to societal forces, they failed to ask how the specific features of a nation's economy, educational system, or political apparatus will influence the process of organizational redesign (Cohen & Zysman, 1987; Gallie, 1978; Piore & Sabel, 1984).

Despite such flaws, this emerging theory of organizational tension and contradiction has begun to integrate elements from existing theories, thereby providing a more comprehensive account. In contrast to the naive technological determinism of theorists such as Blauner, Zuboff was quite aware of management's attachment to power and authority. Unlike orthodox deskilling theorists, she observed that information technologies spawn *new forms* of skill that are distinct from older, manually based knowledge (Adler, 1986, 1988). Indeed, in perspectives such as this, the very distinction between upgrading and deskilling theory itself begins to break down.

INTERNATIONALIZING THE DEBATE

Particularly in the United States, skill researchers have made little effort to explore how societal differences may impinge on the distribution of skill and expertise. This situation is beginning to change (Gallie, 1978; Kalleberg, 1988; Kelley, 1986; Littler, 1982, 1990). Theorists have begun to recognize the impossibility of understanding the effects of technology on work structures, for example, without addressing national variations in trade union organizations, patterns of schooling and occupational certification, as well as other aspects of organizational environments.

The article by Heisig and Littek (following issue) will surely accelerate the trend toward more comparative research. As these authors show, deskilling theory has been extremely influential in the Federal Republic of Germany, much as in the United States and England. Yet ironically, the popularity of the theory acted to obscure the ways in which the distinctive features of West German society led employers to adopt models of work design that bear little resemblance to Taylorism. West German employers can take for granted the existence of a large stratum of qualified white-collar workers who have been technically and socially prepared to assume autonomous positions as

trustworthy employees. Moreover, qualified administrative employees have been able to *use* their technical knowledge as a resource with which to shape the job redesign process, insuring the maintenance of their autonomy (Child et al., 1984). For these reasons, Heisig and Littek argue that West German employers ultimately abandoned the deskilling strategy, adopting a "skill-oriented modernization policy" instead.

Readers will perhaps view Heisig and Littek's analysis as an extension of the Piore and Sabel (1984) theory of flexible specialization (see also Kern & Schuman, 1984, 1987). Piore and Sabel, of course, based their views on changes in *product* markets, which they claimed have grown more highly variable and balkanized than in the era of mass consumption. In contrast, the thrust of Heisig and Littek's contribution stresses the impact of *labor* markets (and educational systems more broadly) on the structure of work as such (cf. Maurice, Sorge, & Warner, 1980). By drawing attention to schooling as a formative influence affecting work organization, their analysis thus contributes to and widens the debate on national differences in the distribution of skill.

THE SOCIAL CONSTRUCTION OF SKILL

Virtually all of the studies discussed to this point viewed "skill" as a relatively straightforward component of job design. In this respect, we see a partial convergence between positivist and Marxist perspectives, in that both adhere to variants of a materialist epistemology. The state of the art in skill research methods has, of course, been most fully developed by positivists, as Spenner's contribution to this issue makes clear. Yet a number of analysts has begun to depart from the positivist framework, which they view as implicitly technicist. Some researchers in this vein have drawn inspiration from the literature on "tacit skills" (see Kusterer, 1978; Manwaring & Wood, 1985). In other cases, the focal concern stems from an interest in the link between gender inequality and the perception and evaluation of skill. Either way, the notion is that the labeling of certain jobs or occupations as "skilled" reflects a wide array of social and ideological processes quite apart from the demands of workers' tasks. The point here is that rather than taking skill requirements for granted, we need to define the social valuation of work as an object of study in its own right.

The constructionist view of skill has not given rise to any single well-defined school of thought. One version of the thesis has been applied to the study of craft occupations (see especially Hobsbawm, 1964; Turner, 1962) and, to some extent, the professions as well (Collins, 1979; Johnson, 1973;

Parkin, 1979). Drawing on Weberian theory, this argument holds that "skill" is often based at least as much on occupational ideology as on industrial requirements (see Attewell, this issue). By imbuing their tasks with the aura of skill and limiting potential entrants into the field, incumbents try to secure certain privileges for themselves, monopolizing social positions whose tasks require less preparation than they proclaim.

Some researchers have recently cast doubt on this formulation. For example, More (1980, 1982) has argued that trade union organizations seldom possess the breadth of market power needed to construct and maintain the "skilled" label as such. More studied the survival of apprenticeship systems in Great Britain and concluded that their persistence is rooted in the logic of the production process, rather than the actions of labor organizations. More spoke for many other theorists when he assumed that "false" skills cannot long survive the heat of economic competition. However, this view may oversimplify the nature and valuation of skill, for it rests on a distinction between "real" and "counterfeit" skills that may belie reality. For one thing, even jobs that require similar levels of "real" technical knowledge will be socially evaluated in quite different ways. Typically, the status and power of the incumbents shape the degree to which their skills are acknowledged and rewarded. Moreover, the relation between skill labels and technical realities may be more complex and reciprocal than skeptics have assumed. As Sabel (1982) suggested, craftworkers whose skills have eroded may nonetheless stake out claims to *new* technical knowledge, thus restoring the substance of their skilled status. In such cases, labels need not decay but may instead become or construct organizational reality.

Perhaps the most promising applications of the constructionist thesis, however, are those which stem from feminist research on gender disparities in pay. The guiding insight here is succinctly put by Phillips and Taylor (1980), who argued that "far from being an objective economic fact, skill is often an ideological category imposed on certain types of work by virtue of the sex and power of the workers who perform it." (p. 79) This version of the constructionist thesis contends that social conventions and ideologies routinely enter into job evaluations and classification, to the clear detriment of women workers (England & Dunn, 1988). Precisely *how* this occurs—how gender politics shape the process of job evaluation—is the subject of Steinberg's contribution (this issue). Focusing on the social processes involved in the evaluation of men's and women's jobs, she demonstrates that values and ideology are smuggled into even the most seemingly objective job evaluation systems—even into those that advocates of comparable worth have embraced. Steinberg's article is especially important in that it begins to

break down the wall between comparable worth research and theories of skill that too often prevails among sociologists of work more broadly.

The article by Wajcman (following issue) also contributes to the emerging constructionist perspective but from a different vantage point. According to Wajcman, comparable worth researchers have viewed job evaluations as resting primarily on normative and ideological influences. In so doing, they tacitly embrace an idealist perspective that overlooks the importance of material realities at work. Gender disparities are not rooted only in the evaluation of work; in addition, they are embedded in the very design of tools and tasks. Wajcman contends that there is nothing inherent in manual work that requires its implements to be as heavy and unwieldy as they are. Rather, the bundles of tasks that gain currency implicitly reflect *male* characteristics and capacities. Her point is that research on the link between gender politics and skill levels cannot address merely the *perception* or valuation of work but must extend its focus into the very technology of work as such.

CONCLUSION

While there are encouraging developments on the horizon in skill research, many areas and issues remain unexplored. One such issue concerns the causal order of the link between technology and skill. At least some of the studies discussed in this article have explicitly assumed that workplace technologies do indeed shape the contours of workers' tasks (Adler, 1986; Zuboff, 1988). Yet other researchers vehemently reject this assumption, viewing it as inherently tainted or ideological (Noble, 1977, 1984). It remains unclear which view will prevail or even whether these two approaches are fundamentally at odds. Surely, technologies *do* change the context in which work is performed; and surely, as parts of human culture, they *are* shaped by values and ideologies—especially those of the powerful. Obviously one important area of research concerns the reciprocal effects of ideology and technique.

A second issue concerns the link between skill and worker consciousness. Much of the literature on skill has implicitly assumed that the content of workers' jobs will powerfully shape workers' social and political attitudes. Yet for a variety of reasons, this premise has not been systematically explored. Although Kohn (1969, in press) and his colleagues amply demonstrated the connection between work content and personality, the link between skill and social consciousness remains poorly understood. One methodological hindrance stems from the lack of standard survey measures of

skill. Symptomatically perhaps, Kalleberg and Leight (1986) invoked measures drawn from the Quality of Employment Survey but with results that seem at best mixed. The measures in my own research (Vallas, 1987, 1988) are also far from optimal. Clearly there is much room for improvement in survey instruments that purport to measure skill requirements.

A related concern lies in the need for comparative and historical research on the role that skill divisions play in the process of class formation. Form (1976, 1986) viewed skill divisions as an enduring source of stratification within the contemporary working class, especially when (as often happens) such divisions run parallel to ethnic and racial boundaries. Yet because Form viewed skill divisions as a necessary outcome of the modernization process, he paid little heed to social and political sources of variation in skilled workers' consciousness. The question therefore remains to be addressed: Why do skilled workers adopt especially strong leftist attitudes in some national contexts, while in other contexts, they wax conservative? The question has only now begun to attract attention among researchers concerned with the process of class formation (Hamilton, 1967; Haydu, 1988; Katznelson & Zolberg, 1986; Sabel, 1982). Clearly, sociological research on skill is just beginning to organize its own tasks.

NOTES

1. Owing to space limitations, the following discussion cannot consider the widening literature on flexible specialization in any detail (see Piore & Sabel, 1984; Wood, 1989).

2. Various expressions of this perspective are Blauner (1964), Bell (1973), Shepard (1971), and Hull et al. (1982). More sophisticated statements are Hirschhorn (1984), Adler (1986, 1988), and Zuboff (1988), discussed in more detail later. I view notions of "flexible specialization" as distinct from the upgrading tradition in that they reject technological determinism and place major emphasis on the structure of markets and cultural tastes in the shaping of the production process (see readings in Wood, 1989).

3. Thus some researchers used national survey data to reconstruct changes in skill levels (Baron & Bielby, 1982; Form & McMillan, 1983; Mueller et al., 1969), while others mapped skill data onto census occupational codes to measure changes in the class structure over time (Wright & Martin, 1987; Wright & Singelmann, 1982).

4. Elsewhere (Vallas, in press), I explored a case in which precisely this occurred, where rising levels of workers' skills have gone hand in hand with increasing managerial control over the labor process as a whole.

5. Adler (1988, p. 6) noticed this point, but read deskilling theory as positing only absolute declines in skill requirements over time. For a different view, see Armstrong (1988, p. 151).

6. There is a strong resemblance between the argument of Hirschhorn, Zuboff, and Adler and earlier theories of "new working class" (see Gorz, 1964; Low-Beer, 1978, Mallet, 1975).

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