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Work Employment Society 1991 5: 319

DOI: 10.1177/0950017091005003002

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Abstract: The debate about the long-term direction of skill trends has occupied a central place in economic sociology, but there has been a virtual absence of relevant representative data. This paper draws on a major new source of survey data to assess three perspectives on skill change. Using a number of different indicators of skill, it examines whether changes in the occupational structure do reflect an expansion of higher skilled jobs. It then considers the extent to which people have experienced upskilling or deskilling within occupational classes. Finally, it looks at the implications of the growth of the service sector, of technological change and of gender for the distribution of skills and for the experience of skill change. It concludes that, while there is little evidence of extensive deskilling, there has been a marked tendency towards the polarization of skills in the 1980s.

PATTERNS OF SKILL CHANGE: UPSKILLING, DESKILLING OR THE POLARIZATION OF SKILLS?

Duncan Gallie

Introduction

A central concern of social scientific analysis of work and work organization has been with the way in which economic change affects the level of skill and the distribution of skills within the working population. We can distinguish three broad lines of argument. The first, which might be described as the 'optimistic perspective', postulates that the technological development of the advanced industrial societies implies steadily more complex types of work task and therefore higher levels of skill (e.g. Kerr *et al.* 1960; Blauner 1964). This change both results in an upward shift in the overall occupational structure of the workforce (marked in particular by the relative growth of non-manual occupations and the decline of manual) and leads to skill increases within occupational categories. These changes in the character of work tasks and work skills, it is argued, have major implications for patterns of work organization. With higher levels of skill, employers become increasingly dependant upon the willingness of employees to use their initiative, and organizations must be designed in a way that allows employees greater discretion at work.

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A second perspective, however, suggests a very different scenario of long-term change. A number of writers have built upon the theories of 'scientific management' to argue that the dominant tendency is towards a decline in the real skill content of jobs (e.g. Braverman 1974; Crompton & Jones 1984). These authors do not ignore the striking expansion of non-manual work, nor do they deny that formal skill gradings might suggest rising levels of skills. Where they differ is in their interpretation of these phenomena. The growth of non-manual occupations, they argue, has been accompanied by a profound internal transformation of their character. As non-manual work has become more central to production, it has been increasingly routinized and mechanized – a tendency accelerated by the rapid diffusion of office automation. Non-manual employees lose their relatively privileged work situation and become broadly similar in their skill levels to manual employees. At the same time, mechanization and automation undercut traditional skills among manual employees, a process reflected in the decline of pre-job training times. In introducing organizational change employers may well find it useful to relabel posts in a way that sweetens the pill of a declining quality of work, offering employees increased organizational status and even the appearance of promotion. But this expansion of higher grades is deceptive: it reflects an industrial relations' strategy rather than any real increase in skill levels. The underlying dynamic behind the process of deskilling is thought to be an increased concern by management to tighten control over the work process. A high level of employee discretion decreases predictability and gives the workforce power to resist managerial efforts to achieve higher productivity and higher levels of profit. By routinizing work, predictability is increased and the capacity of employees to resist is weakened through the greater substitutability of labour.

A third position combines elements of the first two. Rather than postulating some general tendency towards either upskilling or the lowering of skill levels, the central development is seen to be an increasing polarization of the workforce between those who benefit from economic change through an improvement in their work situation and career chances and those who are trapped in low skilled and generally disadvantaged forms of employment. There are different versions of the argument. Some maintain that there is a growing division between a primary labour market for the higher skilled, with work systems based on high levels of employee autonomy backed up by training and career incentives, and a secondary labour market, where management makes little effort to maintain skills through training but relies on intensifying work effort through deskilling and direct supervisory control (Edwards 1979; Edwards *et al.* 1975). The primary sector is sometimes identified with large firms in near monopolistic product market situations, and the secondary sector with smaller companies in competitive market situations. Another version lays explanatory

emphasis for the growth of the primary sector on the implications of advanced technologies for the growth of firm specific skills (Doeringer & Piore 1971). This, it is suggested, places pressure on firms to provide adequate training and to create a work environment that encourages employees to remain in the firm, thus minimizing lost training investment. This effective conversion of part of the workforce into a fixed cost is accompanied by the development of another sector of insecure secondary labour that can be easily disposed of if there is a fall in demand (Berger and Piore 1981). Yet other versions of the polarization argument stress the difference between developments in manufacturing industry, where employment is predominantly full-time and the unions are well rooted, and those in the service sector where a higher proportion of employment is part-time, casual and low quality.

This paper seeks to address some of the issues raised by this debate. First, using a number of different indicators of skill, it examines whether changes in the occupational structure do reflect an expansion of higher skilled jobs. Second, it considers the extent to which people experienced upskilling or deskilling within occupational classes in the early 1980s. Finally, it looks at the implications of the growth of the service sector, of technological change and of gender for the distribution of skills and for the experience of skill change.

The data are drawn from the ESRC's Social Change and Economic Life Initiative. This was based on six urban labour markets selected to provide contrasting labour market conditions. Three of the labour markets – Swindon, Aberdeen and Northampton – had known relatively buoyant employment conditions for the better part of the 1980s, although more recently there had been a sharp deterioration in the economic situation in Aberdeen. The other three labour markets – Coventry, Rochdale and Kirkcaldy – had experienced prolonged recession through the 1980s, although there were some signs of the emergence of a new and more dynamic sector in Kirkcaldy. In each of the six localities interviews were carried out in 1986 with 1,000 people. Respondents for the survey were randomly selected from the overall non-institutional population aged between 20 and 60.¹

Occupational Change and Skill

There is general agreement that there has been a long-term rise in non-manual employment. Routh (1987), for example, has traced this across the century through a detailed comparison of the census data.

While the non-manual categories were rapidly expanding, the manual workforce was declining in both relative and absolute terms. On the eve of the First World War, nearly 80 per cent of the occupied population were

manual workers; by 1987, the workforce was roughly evenly divided between manual and non-manual (48 per cent non-manual, 52 per cent manual).

A major problem in making rigorous comparisons across time is the lack of commensurability of the different occupational classification systems used in different censuses. A very similar picture of the general trends, however, emerges if we compare in our own data the distribution of occupations of parents and children coded to a common classification system. While the original coding was in terms of a very much more detailed register of occupational titles (Prandy classification) than is provided by the Registrar General's classification, the most convenient way to study the general pattern is to look at the data aggregated into the Goldthorpe occupational class schema which is increasingly being accepted as the most robust of the more aggregated classification systems (Goldthorpe 1987; Marshall *et al.* 1988). Given the sample numbers, we have adopted a version of the class schema that groups classes 1 and 2 into a single service class of professionals, administrators, managers, higher technicians and non-manual supervisors. We have also put together semi and unskilled manual workers and routine sales and service workers into a single category of the non-skilled manual class. This type of comparison between parents and children does not give an accurate snapshot of the social structure for some specific point in the past, but it is likely to be a good indication of general trends of change. Table 1a shows clearly that, for both men and women, there has been a marked shift towards non-manual work between the types of jobs that the parents were engaged in when the children were 14 years old and the types of jobs that the members of our sample currently held. Whereas 37 per cent of the fathers had had non-manual jobs, this was the case for 49 per cent of the sons. Similarly, the proportion of women in non-manual work has risen from 31 per cent to 51 per cent. There has been a particular sharp rise in the proportion in the Goldthorpe 'service class'. On the other hand, there has been a fairly steep decline in both the skilled and non-skilled working classes.

Further confirmation of the pattern of change can be found if the more prosperous local labour markets are compared with those that had suffered more profoundly from economic recession. If we look at those currently in employment, the more prosperous labour markets had the highest proportion of non-manual workers and the lowest proportion of manual (Table 1b). The difference ranged from Aberdeen at one end of the spectrum, where 59 per cent of employees were in non-manual work, to Kirkcaldy at the other where less than half of employees (45 per cent) were non-manual. Even at locality level, then, economic growth would appear to be clearly related to change in the occupational structure.

However, while this general pattern of occupational change is difficult to contest, what has been much more controversial is the significance that

Table 1

(a) Class Distribution: Respondents and Parents.							
	Men	Father's Class	Women	Mother's Class			
Service (%)	34	23	21	8			
Lower Non-Manual (%)	7	6	27	21			
Technical/Supervisory (%)	8	8	3	2			
Skilled Manual (%)	22	30	7	17			
Non-Skilled Manual (%)	30	36	42	51			
All Non-Manual (%)	49	37	51	31			
(b) Classes by Area: Current Employees							
	Aberdeen	Coventry	Kirkcaldy	Northampton	Rochdale	Swindon	Total
Service (%)	34	27	27	33	31	34	31
Lower Non-Manual (%)	19	18	12	19	16	15	17
Technical/Supervisory (%)	6	5	6	6	6	7	6
Skilled Manual (%)	13	18	18	16	13	10	15
Non-Skilled Manual (%)	28	33	36	27	33	32	31
All Non-Manual (%)	59	50	45	58	53	54	54
N	727	606	596	660	634	649	3872

Table 2 Skill Characteristics by Class

	% O Level equivalent currently required	% no training	% learned to do the job in less than a month
Service	85	34	10
Lower Non-Manual	61	52	21
Technical/Supervisory	50	49	24
Skilled Manual	51	43	17
Non-Skilled Manual	12	76	52
	% responsible for work of others	% consider job skilled	
Service	65	91	
Lower Non-Manual	22	68	
Technical/Supervisory	64	70	
Skilled Manual	27	86	
Non-Skilled Manual	13	40	

should be attached to such changes. The optimistic scenario relies heavily on the view that the growth of non-manual work in terms of such classifications represents a real increase in the skill content of jobs. Defenders of the pessimistic scenario argue that such classification systems are often arbitrarily arrived at or are based on wholly outdated conceptions of the skill involved in particular types of job. It has to be said that the relationships between such classifications and skill is problematic. The definition of the Registrar's General's class schema has gone through some bewildering changes. At one stage presented as a measure of the social standing of occupations, it was converted into a measure of skill ranking with curiously little reorganization of its constituent categories. Certainly, we have little information about the criteria on which decisions about skill ranking were reached. The Goldthorpe class schema does not claim to provide a hierarchical ranking of skills. It seeks to classify people in terms of the different types of employment relations in which they are involved. This leaves open the precise linkages between such categories and skill criteria *per se*. Similarly, the analysis of social change through the use of such schemas raises the issue of the extent to which changes in class distribution reflect changes in general skill levels, as distinct from mere changes in the distribution of occupational titles or changes in other aspects of people's employment situation.

To examine this, we clearly need to compare occupational classes in terms of more specific criteria of skill. This, however, is easier said than done, given that one aspect of the controversy between optimists and pessimists involves the meaning of skill and hence what constitutes an appropriate indicator of skill. Very broadly, the pessimists have tended to adhere to what might be termed a 'craft definition' of skill, in which skill content is most effectively measured by the amount of task-specific training required. The optimists, on the other hand, have argued that one of the most fundamental characteristics of social change is precisely a change in the nature of skill. Increasingly, it is suggested, effective work performance depends upon the use of more general educational skills and people's ability to exercise responsibility. Given our current, very inadequate, state of knowledge about such issues, the most prudent course is to take into account a variety of rather different indicators of skill. In particular, we have focussed upon five indicators: first, people's reports about the qualifications that somebody would need to get their type of job if they were applying for it now; second, the length of training that people received for their kind of work after completing full-time education; third, the amount of time that it had taken them, after they first started the type of job, to learn to do it well; fourth, whether or not they had direct responsibility for supervising the work of others, and fifth, whether they themselves considered their work to be skilled. Together, these various measures cover both the 'craft' and the 'general education/responsibility' conceptions of skill.

To what extent do the class categories represent different levels or types of skill? If we take the Goldthorpe classes, a first point to note is that the service class is quite clearly differentiated from all others. For instance, if we take the qualification levels that are currently required, some 85 per cent of service class employees report that at least O Level or its equivalent would be required, whereas in the class that comes closest to this – the lower non-manual workers – the proportion was only 61 per cent (Table 2). Those in the service class were also quite clearly the mostly likely to have received training for their work, they were the least likely to think that they could learn to do the job well in a short period of time, and they were the most likely to think of their job as skilled.

However, when we turn to the lower non-manual, the technician/ supervisory and the skilled manual categories, there are few grounds for asserting any clear skill ranking between classes. Rather, we appear to be dealing with rather different types of skills. For instance, lower non-manual workers were substantially more likely than employees in the other two classes to be in jobs where at least O Level or its equivalent would be required. On the other hand, they were less likely than skilled manual workers to have had training for their type of job or to think of their own work as skilled. Those in the technician/supervisory class were much akin to skilled manual workers in terms of qualifications needed and they were rather less likely to be trained or to feel that they needed experience before being able to do the job well. Where of course they rank much higher is in the responsibility their work carries. With the exception of responsibility, these three classes are closer to each other on the various skill dimensions than they are to other classes. In so far as there are differences, we are dealing with quite distinct dimensions of skill and any simple ranking would be misleading.

What does, however, emerge quite clearly from the data is the sharp break between these three intermediary classes and the non-skilled manual workers. The latter come at the bottom of the skill hierarchy on every one of our indicators and the gap between them and the class closest to them is usually very large. For instance, only 12 per cent of non-skilled manual workers were in jobs where employers were requiring at least O Level or its equivalent, whereas in the next lowest class on this dimension – the technician/supervisory class – the figure was 50 per cent. As much as 76 per cent of non-skilled manual workers were in jobs that required no training at all, whereas even among the lower non-manual employees the figure was only 52 per cent. Non-skilled manual employees were twice as likely as those in any other class to say that they could learn to do their job well in less than a month. Finally, this was the only class in which a majority of employees regarded their work as unskilled. Whereas 68 per cent of lower non-manual workers, 70 per cent of those in the technician/supervisory class and 86 per cent of skilled manual workers thought their work was skilled, the figure for non-skilled manual workers falls to 40 per cent.

It is, then, the respective sizes of the service and non-skilled manual classes (rather than of the non-manual and manual categories) that must be viewed as the key indicators of general skill levels. In these terms, it is still clear that the general trend has been towards the expansion of more skilled occupations. Taking the service class, for instance, 23 per cent of fathers but 34 per cent of sons were in this category, while the proportions among women had increased from 8 per cent to 21 per cent (Table 1a). Similarly, there has been a clear decline in the proportion of the workforce in non-skilled manual work. Whereas 36 per cent of fathers had been non-skilled manual workers, this was the case for only 30 per cent of sons; 51 per cent of mothers had been in this type of work, compared with 42 per cent of daughters. Similarly, if the current class structures of the more prosperous and more recessionary labour markets are compared, there is a consistent pattern in which the size of the service class is larger in the more prosperous labour markets and the size of the non-skilled manual class is smaller. The more prosperous labour markets reveal an upward shift in the skill distribution, which cannot be dismissed easily as a mere artefact of labelling procedures.

Patterns of Change in Skill within Occupational Classes

An increase in skill levels due to the expansion of higher-skilled occupational classes may be offset by a sharp deterioration of skill levels within classes. It is necessary to examine directly whether or not people have experienced skill changes. Again, given the variety of conceptualizations of skill, it is important to examine patterns of change using more than one measure. People were first asked about whether they felt that the level of skill that they used in their job had increased, decreased or stayed the same over the previous five years, and then whether there had been changes in the level of responsibility involved in their job.²

The first point to note is that on each of these indicators, a much higher proportion of employees report an increase in the skill level of their jobs than report a decrease. Overall, as can be seen in Table 3, 52 per cent of employees indicated that the level of skill they used in their job had increased over the five years, whereas it had decreased for only 9 per cent. An even higher proportion – 60 per cent – said that the responsibility involved in their job had increased, while only 7 per cent said that there had been a decrease. The frequency with which people reported skill increases varied considerably, however, by class. Among service class employees, some two-thirds (67 per cent) reported that the skills involved in their job had increased over the last five years. The fiercest controversy in the literature has centered on the experiences of lower non-manual and skilled

Table 3 Changes in Skill and Responsibility

% increase or decrease in skill	All employees 1986		Employees in same class 1981-6		Employees in same OUG 1981-6		Employees with no 'job' change 1981-6	
	% Increase	% Decrease	% Increase	% Decrease	% Increase	% Decrease	% Increase	% Decrease
Service	67	4	65	3	64	2	59	1
Lower Non-Manual	55	7	52	5	51	5	43	2
Technical/Supervisory	56	9	50	5	48	4	47	3
Skilled Manual	50	8	49	8	47	6	38	7
Non-Skilled Manual	33	15	33	12	33	5	27	4
All	52	9	50	7	49	4	42	3
	(3101)		(2609)		(2059)		(1238)	
% increase or decrease in responsibility								
Service	72	4	70	4	68	3	62	1
Lower Non-Manual	60	8	58	6	57	4	48	1
Technical/Supervisory	75	4	72	1	71	1	67	2
Skilled Manual	59	6	59	5	58	3	51	2
Non-Skilled Manual	42	10	43	7	40	2	33	2
All	60	7	58	5	57	3	49	2
	(3100)		(2604)		(2055)		(1238)	

manual workers. Our evidence here is quite unambiguous. While workers in these classes were less likely than service class workers to have experienced a skill increase, it was still the case that about half felt that the level of skill that they used in their job had become greater, and people were very much more likely to have experienced an increase in skill than a decrease. Whereas 55 per cent of lower non-manual employees and 50 per cent of skilled manual felt that their jobs now demanded a higher level of skill, not more than 8 per cent in either category felt that the skill level of their work had decreased.

The real break in employment experiences would again appear to be between the intermediate classes and the non-skilled manual workers. While even among latter, the proportion that reported a decline in their skills was a mere 15 per cent, it is notable, nonetheless, that the experience of a skill increase was very much rarer than in any other class. Only 33 per cent felt that the skill level of their work had increased during the previous five years, while the majority (53 per cent) felt that it had remained unchanged. Similarly, the non-skilled manual class was the only one in which a majority of employees (58 per cent) felt that the responsibility involved in their work had either stayed the same or decreased.

The experience of an increase in the level of skills that people use in their job might reflect two rather different processes. It might be the result of upward occupational mobility or of changes in work at the same broad occupational level. We can explore this by constructing mobility profiles for the period 1981 to 1986. Those who remained within the same Goldthorpe class over this period are classified as immobile, while those who moved up from the intermediate or manual into the service class, or from the manual working class into one of the intermediate classes, are classified as upwardly mobile. Conversely those who moved from a service class position to an intermediate class or to the working class are taken as downwardly mobile, and the same holds for those who moved from an intermediate class to the working class. How did the subjective experience of skill change vary with these different patterns of mobility?

A first point to note is that the great majority of employees had not experienced any significant class mobility over this period. Overall 84 per cent were in the same class position in 1986 as they had been in 1981. Some 6 per cent had been upwardly mobile into the service class and a further 4 per cent from the manual working class into one of the intermediate classes. Downward mobility was less frequent than upward mobility over this period, with some 2 per cent moving from the service class to an intermediate class position and 4 per cent being downwardly mobile into the manual working class.

It is clear that those that had been upwardly mobile were considerably more likely to have experienced an increase in their skill levels. The greatest increase in skills (78 per cent) was among those that had moved from the

manual working class to the service class, followed by people who had changed from an intermediate class to the service class.³ Mobility between the manual and the technical/supervisory or lower non-manual classes was also accompanied for the great majority (68 per cent) by an increase in skill levels. The picture when one turns to the indicator of responsibility in work is similar. Those that have been upwardly mobile in terms of their class position have overwhelmingly taken up work requiring greater responsibility.

On the other hand, the downwardly mobile in class terms are also distinctive in that they are the only category in which we find substantial levels of deskilling. For instance, 33 per cent of people who had moved from a service class position to the manual working class felt that their work involved a lower level of skill than before, and this was the case of a similar proportion of those that had moved from an intermediate class to the working class. Similarly, with the experience of changes in responsibility, it is those that have been downwardly mobile in class terms that had had the sharpest experience of the degradation of work. Overall, 32 per cent of those that had been downwardly mobile had moved to work involving less responsibility. This primarily reflected the experiences of those that had moved from non-manual to manual work.

The inclusion of the upwardly mobile, then, is certainly likely to raise the proportions that have experienced skill increases, while the inclusion of the downwardly mobile reduces them. If we focus on those that had remained in the same class over the five years, however, it is striking how little difference the exclusion of the mobile categories makes (Table 3). We still find that only a very small proportion of employees (7 per cent), felt that their work had been deskilled. At the same time, there remain very considerable variations in people's experiences by class. Whereas 65 per cent of service class employees had experienced a skill increase over the period, the proportion among non-skilled manual workers falls to 33 per cent. Similarly, 70 per cent of service class employees had seen the responsibility involved in their job increase, while this was the case for only 43 per cent of the non-skilled manual workers.

It might be that there is still mobility, albeit, of a limited kind, within classes and that it is the experiences of those that have benefitted from such career moves that accounts for the generally low level of deskilling. Similarly, classes may differ in the extent to which they provide opportunities for upward mobility and this may explain the wide discrepancies in experiences by class. We examined this by focussing down first on those that had remained within the same occupational group between 1981 and 1986 and second, most stringently, on those that had experienced no change either in their employer or in the type of work they were doing over these years. The pattern among those that had remained within the same occupational group is virtually indistinguishable from that of employees that had remained in the same class: we find very similar overall proportions that had experienced

upskilling and very similar inter-class differences. If we turn to the wholly immobile group – those for whom we can be sure that there has been no element of career mobility – there is some decline in the proportions that had seen their skills increase over the period, but the broad picture remains the same (Table 3). The likelihood of having experienced a skill increase remains very much higher than that of having been deskilled. Indeed, those that have experienced no mobility at all are also the least likely to have been deskilled (3 per cent). This confirms that deskilling, in so far as it occurs, is very rarely experienced by people that remain at the same job; rather it is connected with changes between jobs.

Finally, the sharply diverging experiences of service class and non-skilled manual employees cannot be accounted for in terms of differential patterns of intra-class mobility. One might have expected career moves to have been a particularly important source of the experience of upskilling within the service class, but in practice, the difference between service class and non-skilled manual workers remains every bit as sharp when career movers are eliminated. It is clear that the experience of upskilling has been widespread in the service class even among those who remained in the same jobs (59 per cent), while among non-skilled manual workers it has been very rare (27 per cent).

In short, even if one discounts the effects of significant upward mobility through the occupational structure, there is very little evidence of substantial deskilling. For the great majority that have remained in the same general position in the occupational structure, the experience has been either an increase in, or a continuity of, the skills and responsibility involved in their work. In so far as people have experienced deskilling, this flows from a significant change in their location in the occupational structure. It is only among those that had been downwardly mobile that we find really significant levels of deskilling. At the same time, our evidence does provide some support for the view that a polarization of skills is occurring. This does not take the form of a contrast between a sector where skills are rising and a sector where they are declining. Rather the contrast is between those in higher occupational classes that have experienced an enrichment of their skills and those in non-skilled manual work whose position has remained static. In general, recent changes appear to be aggravating past differences in skill levels in that those in more skilled work were more likely to have increased their skills, while those in less skilled work were overwhelmingly likely to have remained at the same skill level.

The Implications for Skill of the Growth of the Service Sector

What are the processes underlying these patterns of skill differentiation? To begin with the conflicting arguments about skill have frequently been

Table 4 Class Composition of Sectors

	Nationalized Industries	Private Manufacturing	Public Services	Private Services	All Manufacturing	All Services
Service	27	23	45	25	23	35
Lower Non-Manual	11	10	17	25	10	21
Technical/Supervisory	9	5	6	6	6	6
Skilled Manual	24	30	5	8	29	6
Non-Skilled Manual	29	32	27	36	32	32
% of all employees	4	29	31	30	33	61
N	(151)	(1077)	(1162)	(1099)	(1236)	(2292)

linked to rather different views about the implications of the growth of the service sector. For the optimists, this represents the expansion of knowledge-based occupations and leads to an increase in the qualifications and skill required in work (Bell 1974). For the pessimists, the expansion of the service sector is characterized by the growth of a cheap, poorly qualified, workforce that is confined to routine, repetitive work (Braverman 1974).

If we compare, in Table 4, the overall occupational class distributions between manufacturing and services, we find little evidence of a clear trend towards lower-level jobs. Rather, the service class is larger in the service sector than in manufacturing (35 per cent compared with 23 per cent), while the proportion of employees in non-skilled manual work is similar. The other major difference is the much higher proportion of skilled manual workers in manufacturing and of lower non-manual workers in services. However, we have seen earlier that it would be misleading to see such differences as constituting a skill shift in any particular direction.

For the purposes of these debates the manufacturing and service sectors are often discussed as though they were internally homogeneous. Yet it seems more probable that there are very important lines of internal differentiation and one of these is likely to be the distinction between the public and private subsectors. In fact, our data shows that, while the class compositions in public and private manufacturing are broadly similar, they differ substantially between the public and private services. The service class is very much larger in the public than in the private services, while the non-skilled manual class is considerably bigger in the private services. In the private services, the service class is roughly the same size as in manufacturing, while the non-skilled manual class is larger than in any other sub-sector (36 per cent). To the extent, then, that the growth of the services is based on private sector growth, there is some support for the view that it is generating a particularly high proportion of low-level jobs.

We have examined more closely the nature of intersectoral differences by comparing classes in manufacturing and services in terms of our earlier skill criteria.³ Overall, the service and lower non-manual classes are fairly similar in the two sectors, while there are some indications that skilled manual workers may have higher skill levels in the service sector. The two classes for which service sector work does appear to be associated with lower skill levels are the technician/supervisory class and the non-skilled manual class. This was the case in both the public and the private services. The exceptionally high proportion of non-skilled manual workers in private services is then compounded by the fact that jobs in this category are of an even lower skill level than their equivalents in manufacturing.

Finally, how do peoples' experiences of skill change compare in the two sectors? The basic pattern found earlier in which the experience of upskilling was very much more frequent than that of deskilling holds for

Table 5 Changes in Skill and Responsibility by Sector

	Nationalized Industries	Private Manufacturing	Public Services	Private Services	All Manufacturing	All Services
<i>% increase in skill</i>						
Service	75	71	66	65	72	66
Lower Non-Manual	63	60	44	61	60	53
Technical/Supervisory	46	60	48	63	57	55
Skilled Manual	40	50	43	56	49	51
Non-Skilled Manual	44	40	26	26	40	26
All	54	53	50	50	53	50
<i>% increase in responsibility</i>						
Service	74	80	69	77	79	71
Lower Non-Manual	40	59	55	65	57	61
Technical/Supervisory	90	83	59	79	85	68
Skilled Manual	63	59	57	60	60	58
Non-Skilled Manual	46	45	38	42	45	40
All	62	61	57	61	61	59

both manufacturing and the services (Table 5). Overall, 53 per cent of employees in manufacturing and 50 per cent in services had experienced a skill increase over the last five years, while only 9 per cent in either sector felt that their skill level had declined. We also find again in each sector the very wide disparities in experience by class. However, there is one striking contrast between sectors – namely, in the degree of disadvantage experienced by non-skilled manual workers in the services compared to manufacturing. Whereas in manufacturing 40 per cent of non-skilled manual workers had increased skill, in the services this was the case for only 26 per cent. The pattern is the same in both the public and the private parts of the service sector. Non-skilled manual workers in the services were also less likely to have increased the responsibility in their jobs, although the difference between manufacturing and services was less substantial – 40 per cent in services, compared with 45 per cent in manufacturing.

Overall, then, the transition from a manufacturing to a service-based economy does not of itself have major implications for patterns of skill. The general distribution of skills in services is if anything higher. What is clear, however, is that there is a deep fissure within the service sector. The private sector is characterized by a particularly high proportion of low-skilled jobs. Furthermore, as with the public services, these jobs are lower skilled than in manufacturing and they have given employees much less chance for increasing their skills in recent years. The structure of work in the service sector, then, aggravates the general tendency towards a polarization in skill experiences.

It might be argued that this simply reflects the type of workers that are available for work in this sector. To examine this we can compare the qualifications that employees have actually obtained with those that are currently required for their jobs (Table 6). This reveals a very interesting pattern. Taking the proportions for at least O Level or its equivalent, we find that overall there is a broad matching of requirements and qualifications in the service class and among skilled manual workers. For the technician/supervisory class, there is some suggestion that, in manufacturing industry, there is a shortfall of employees with the requisite qualifications, while in the service sector a proportion of employees have higher qualifications than they need. It is, however, in the non-skilled manual class that the really major discrepancies emerge between employee qualifications and job requirements. A substantial number of employees in both manufacturing and services have higher qualifications than required, but the tendency to overqualification is particularly marked in the services (and especially in the private services). Indeed, it is notable that, while non-skilled manual work in the services requires similar and possibly lower qualification levels than in manufacturing, the actual qualification levels of employees are significantly higher. It seems likely then that it is the way that jobs are structured, rather than the capacities of the individuals that fill

Table 6 Qualifications Required and Own Qualifications: % O Level equivalent

	Nationalized Industries	Private Manufacturing	Public Services	Private Services	All Manufacturing	All Services
<i>Service</i>						
Required	90	80	92	76	82	86
Own	91	78	91	77	80	86
O-R	+1	-2	-1	+1	-2	0
<i>Lower Non-Manual</i>						
Required	75	59	66	55	61	59
Own	58	61	67	66	61	67
O-R	17	+2	+1	+11	0	+8
<i>Technical/Supervisory</i>						
Required	70	57	44	40	60	43
Own	64	54	57	59	56	59
O-R	-6	-3	+13	+19	-4	+16
<i>Skilled Manual</i>						
Required	43	48	68	45	47	53
Own	36	48	53	53	47	53
O-R	-7	0	-15	+8	0	0
<i>Non-Skilled Manual</i>						
Required	15	13	10	12	13	11
Own	30	25	34	39	25	36
O-R	+15	+12	+24	+27	+12	+25

them, that accounts for the exceptionally low levels of skill in the service sector.

Automation and Skill

What was the impact of advanced technology on people's experience of skill change? One of the most contentious debates in the literature has focussed on the implications of technical change for skill levels (Wood 1982; Lane 1988; Martin 1988). In general this debate has suffered from a heavy reliance on case studies, of unknown typicality, that have provided very diverse pictures of the pattern of change. This has been the case both for studies of manual work (Braverman 1974; Wilson 1988; Clark *et al.* 1988) and for studies of non-manual work (West 1982; Wainwright and Francis 1984; Webster 1986). The one more representative survey of the relationship between technical change and skill (Daniel 1987) concluded strongly in favour of the view that technical change tended to raise the skill level of jobs. This, however, was based entirely on the views of managers. Employees are likely to be closer to the cutting edge of such change, yet there is currently little satisfactory data about the overall trends in their experiences.

Overall 39 per cent of employees in our localities were working with automated or computerized equipment. It might have been expected that the use of advanced equipment would be less prevalent in the recessionary labour markets. However, while it was certainly the case that it was less common in Kirkcaldy (34 per cent), and Rochdale (32 per cent), it is notable that Coventry is very comparable with the more prosperous labour markets. This may partly reflect the processes of automation occurring in car manufacturing, since Coventry was distinct for the high proportion of its non-skilled manual workers using advanced technology.

If we now look at the way in which the use of automated equipment relates to our skill measures, the picture that emerges is a very clear one. On each indicator, work with advanced technology was associated with higher skill levels (Table 7). For instance, of those in jobs involving the use of automated or computerized equipment, 73 per cent of employees reported that at least O Level or its equivalent was required for new recruits, whereas this was the case for only 37 per cent of those that did not use advanced technology. Only 39 per cent of people using automated equipment said that they had not received training for the type of work that they were doing, as against 62 per cent of those not using automated equipment. Further, people reported substantially longer on-the-job learning times with automated equipment. Where such equipment was not used, 35 per cent felt that it had taken a month or less to learn to do the job well, whereas this was the case with only 15 per cent of those using advanced equipment.

Table 7 Advanced Technology and Skill Levels By Class

	% with O Level	O Level + currently required	% No training	Experience needed less than 1 month	Consider job skilled	Responsible for supervising others
<i>Using advanced technology</i>						
Service	87	90	30	7	94	67
Lower Non-Manual Technical/Supervisory	73	74	47	17	75	27
Skilled Manual	62	71	29	14	80	83
Non-Skilled Manual	59	61	36	13	88	44
	48	32	54	35	59	22
All	72	73	39	15	82	49
<i>Not using advanced technology</i>						
Service	82	80	39	15	86	62
Lower Non-Manual Technical/Supervisory	56	44	59	25	60	15
Skilled Manual	55	35	61	29	63	50
Non-Skilled Manual	46	47	47	18	85	21
	28	7	81	56	36	11
All	49	37	62	35	60	27

Table 8 Advanced Technology and Skill Change by Class

	Using Advanced Technology % experiencing increases in		Not Using Advanced Technology % experiencing increases in	
	Skill	Responsibility	Skill	Responsibility
Service	74	78	57	65
Lower Non-Manual	66	68	41	50
Technical/Supervisory	66	88	48	65
Skilled Manual	66	71	44	53
Non-Skilled Manual	53	59	27	37

Conversely, 40 per cent of employees working with advanced technology, as against 30 per cent of others, thought that it required a year or more experience. Finally, 82 per cent of those using automated equipment regarded their jobs as skilled, compared to 60 per cent of those not using it.

An important point to note is that the use of automated or computerized equipment varies considerably by class. For instance, 57 per cent of service class and 51 per cent of lower non-manual employees used it, compared with only 29 per cent of skilled and 19 per cent of non-skilled manual workers. Technicians and supervisors formed an intermediary group (40 per cent). In every category, the use of automated equipment was associated with higher skill demands. However, this was least marked with respect to service class work and it was generally of fairly moderate importance for skilled manual work. It was particularly in the technician, supervisory and lower non-manual categories that advanced technology was related to a higher level of qualifications required for new recruits.

The conclusion that the use of advanced technology is generally associated with a rise in skill levels is reinforced when we examine people's experience of changes in the skill requirements of their work (Table 8). Whereas 67 per cent of those using automated equipment felt that the skill they used in their job had increased over the previous five years, this was the case for only 39 per cent of others. The pattern was consistent across each of the localities and at each class level. However, it was particularly marked with respect to non-skilled manual, lower non-manual and skilled manual work. Further, the argument that advanced technology is related to a higher level of responsibility for employees appears well supported: 74 per cent of those using technologically advanced equipment had experienced an increase in responsibility, compared with 49 per cent of those doing other types of work. The pattern is again very similar across classes.

These results are entirely consistent with the picture that has emerged from interviews with employers (Daniel 1987). The concordance between the two sets of data strongly suggest that the skill changes that have been examined are changes in the requirements of the job, rather than changes in the knowledge and experience that people bring to the same job. This is reinforced by the earlier evidence that there is a difference on the various skill *level* measures between those who were working with advanced technology and those who were not. It is unlikely, however, that these trends reflect a deterministic impact of new technology. Technology *per se* has been shown to be relatively neutral in its implications for work organization (Jones 1982; Hartmann *et al.* 1984; Giordano 1988; Kelly 1988) and, indeed, automation may widen the scope for managerial choice. The general association between technical change and higher skill levels is likely to reflect factors such as the prevailing nature of managerial views about effective ways of enhancing employee motivation and the bargaining

Table 9 Qualifications and Training of Men and Women Employees

	% O Level + currently required	% without training	Experience needed less than 1 month	Responsibility for supervising others	Considers job skilled
<i>Men</i>					
Service	87	32	9	70	93
Lower Non-Manual	70	40	15	35	70
Technical/Supervisory	60	41	16	72	75
Skilled Manual	55	41	12	29	89
Non-Skilled Manual	14	66	36	18	54
All Men	59	44	18	45	79
<i>Women</i>					
Service	82	37	13	56	85
Lower Non-Manual	58	56	23	17	68
Technical/Supervisory	22	71	49	38	54
Skilled Manual	27	57	39	16	68
Non-Skilled Manual	10	84	65	8	29
All Women	43	63	38	24	57

power of employee work groups (Gallie 1988). The introduction of new forms of technology is primarily important in accelerating organizational change, since it gives such issues greater immediacy and it generates greater social structural fluidity.

Gender and Skill

A third factor strongly related to the level of skill is gender. As can be seen in Table 9, men were more likely to be in jobs where at least O Level or its equivalent was required (59 per cent compared with 43 per cent). Conversely, women were far more likely to be in jobs where no qualifications were currently required: 50 per cent of women were in such jobs, whereas, among men, the proportion fell to 32 per cent. There were also striking differences in training between men and women. Less than half of male employees (44 per cent), but nearly two-thirds of women employees (63 per cent) had received no training at all for the type of work that they were currently doing. Finally, 38 per cent of women were in jobs that required less than a month to learn to do well, compared with 18 per cent of men. In short, on the basis of these indicators, the skill requirements of women's jobs would appear to be substantially lower than those of men. It should be noted that these indicators do not take account of arguments about the importance of tacit skills in women's work (Dex 1988). The differences they suggest, however, are reflected in people's subjective perceptions of their jobs. Overall, 79 per cent of men, but only 57 per of women, regard their work as skilled. The difference emerges very clearly in each locality.

The pervasive character of gender segregation in the occupational structure is now well-established. In each of the localities, women were less likely than men to be in service class occupations and very much more likely to be in lower non-manual occupations. Similarly, in the manual categories women were predominantly in the non-skilled manual class while men were more evenly divided between skilled and non-skilled manual work. This raises the possibility that the differences between men and women in terms of qualifications required, training and experience needed are another way of expressing these major differences in allocation between broad occupational classes.

However, our data suggest that differences by gender are even more pervasive than this. What is notable is that within each occupational category women come out lower on each of the skill indicators than men. The consistency of the pattern is altogether remarkable. For instance, among lower non-manual employees, 70 per cent of the men, but only 58 per cent of the women are in jobs where new recruits would be expected to have the equivalent of O Level or higher levels of qualification, while 40 per cent of the men but 56 per cent of the women are without training. Further,

15 per cent of men but 23 per cent of women in lower non-manual jobs said that it had taken less than a month to be able to do the job well. The differences are less marked with respect to service class occupations, but otherwise they are of a similar order of magnitude across classes. This indicates that, even when similarly classified, women are in fact in very different types of work from men.

Has there been a difference in the extent to which men and women have experienced changes in their skill levels in recent years? Our evidence would suggest that men have benefited to a considerably greater extent than women from the process of upskilling. For both men and women, an increase in skills was substantially more likely than a decrease (Table 10). However, whereas a majority of men (56 per cent) had increased their skills in the previous five years, this was the case for only 45 per cent of women. There is also a substantial difference by gender in experiences of change in responsibility: 66 per cent of men as against 50 per cent of women considered that their responsibility had increased. There is some indication then that differences in skill levels between men and women may have been widening in the course of the 1980s.

How are we to account for such significant gender differences in skill experience? We have seen that a major factor associated with both skill levels and skill change has been whether or not people were working with advanced forms of technology. At least part of the difference in recent experiences between men and women may be related to the fact that women are substantially less likely to be working with such equipment. Whereas 46 per cent of men were in jobs that involved the use of computerized or automated equipment, this was the case for only 33 per cent of women. There remain substantial differences in qualifications required, training and on-the-job experience needed even between men and women working with advanced technology. However, as can be seen in Table 11, it is striking that, if technology is controlled for, men and women would appear to have had very similar experiences of skill change: 70 per cent of men working with technically advanced equipment had increased their skills compared with 64 per cent of women. Where people were not working with advanced equipment, a minority of both men and women had experienced a skill increase (44 per cent and 35 per cent respectively).

There was also a clear association between women's experiences of skill change and the degree of gender segregation. As an indicator of gender segregation, we asked people: 'In general, is your type of work done exclusively by men, mainly by men, by a fairly equal mixture of men and women, mainly by women or almost exclusively by women'.⁴ Six per cent of women employees were in types of work primarily carried out by men, while just over a quarter (26 per cent) were in occupations that were seen as having a fairly equal mixture of men and women. The majority of women were in 'feminized' occupations, with 46 per cent in work mainly done by

Table 10 Changes in Skill and Responsibility by Sex

	% increase in skill		% increase in responsibility	
	Men	Women	Men	Women
Service	68	64	75	67
Lower Non-Manual	56	55	66	58
Technical/Supervisory	61	38	79	59
Skilled Manual	52	42	63	28
Non-Skilled Manual	40	24	51	33
All Men	56	45	66	50

Table 11 Skill and Impact of Advanced Technology by Sex.

	Using advanced technology		Not using advanced technology	
	Men	Women	Men	Women
% O Level equivalent currently required	76	67	44	31
% no training	33	48	54	70
% learned to do job in less than 1 month	11	22	23	46
% responsible for work of others	59	31	33	20
% considers job skilled	87	73	72	49
% increase in skills	70	64	44	35
% increase in responsibility	77	65	57	42

women and 22 per cent in work exclusively done by women. As can be seen in Table 12, women in male occupations were twice as likely as women in exclusively female occupations to have experienced an increase in their skills (66 per cent compared with 37 per cent). Indeed women in male occupations were more likely to have had a skill increase than men in this situation. However, men retain their advantage in the mixed sex occupations – with some 66 per cent of men as against 49 per cent of women being upskilled. A virtually identical pattern emerges for changes in responsibility.

Finally, a third factor that would appear to be of major importance is the prevalence of part-time employment. It is particularly women in part-time employment that are in jobs with lower skill requirements than those of men (Table 13). Women in full-time work are closer to the pattern of male employees than they are to that of female part-timers. For instance, women in full-time work are almost as likely to be in jobs requiring at least O Level or its equivalent as men (58 per cent compared with 59 per cent among men). In contrast, only 24 per cent of part-timers were in this type of work. Similarly, women in full-time employment are only marginally more likely to be in jobs not requiring qualifications than the average for male employees (34 per cent compared to 32 per cent), while a majority of women in part-time work (70 per cent) were in jobs requiring no qualifications. The same pattern emerges with training and with the need for on-the-job experience. Moreover, if we turn to the changes that people have experienced in their skills over the last five years, it is notable that, once part-time workers are excluded, the gender difference disappears entirely: 58 per cent of women in full-time employment experienced an increase in their skill levels compared with five years earlier, whereas this was the case for 56 per cent of men. On the other hand, among women in part-time work, a mere 26 per cent had experienced an increase in the skill required of their job.

We have seen that the chances of women increasing their skill varies powerfully by the degree of occupational and workplace gender segregation. But why should this be the case? Given the importance of the full-time/part-time divide for women's employment experiences, one possibility is that gender segregation is important because of the way in which it is linked to different types of employment contract. This is indeed an important part of the explanation. The proportion of women in full-time employment grows as one moves from segregated to desegregated jobs. It is clear that a considerable part of the effect of gender segregation can be attributed to the greater prevalence of part-time work in the more highly segregated settings (Table 14). Full-timers in mainly 'female' work are actually more likely to have experienced an increase in skills than those in non-gendered occupations and they are only a little behind women employed in predominantly male occupations. While women full-timers in a

Table 12 Increasing Skill and Responsibility By Occupational Segregation

	<i>Job is done:</i>				
	Almost exclusively by Men	Mainly by Men	Equal Men/ Women	Mainly by Women	Exclusively by Women
% Men increasing skill	51 (920)	57 (756)	66 (285)	61 (17)	— (1)
% Men increasing responsibility	62 (922)	67 (758)	74 (285)	64 (17)	— (1)
% Women increasing skill	66 (11)	67 (60)	49 (322)	44 (584)	37 (280)
% Women increasing responsibility	75 (11)	76 (60)	57 (322)	48 (580)	40 (279)

Table 13 Comparison of Women in Full-Time and Part-Time Work

	% No qualifications required	% O Level equivalent + required	% No training	% 1 year + training	% less > 1 month experience needed	% 1 year + experience needed
Women in PT.	70	24	78	9	58	10
Women in FT.	34	58	51	24	23	27
All Men	32	59	44	35	18	45
	% Consider Job Skilled	% Responsible for supervising others	% Experience increase in skills	% Experience increase in responsibility	% Using advanced technology	
Women in PT.	38	10	26	34	19	
Women in FT.	72	35	58	61	45	
All Men	79	45	56	66	46	

Table 14 % of Women Increasing Skill by Degree of Occupational Segregation: Full-Time and Part-Time Employees

	<i>Job is done:</i>				
	Exclusively by Men	Mainly by Men	Equal Men/ Women	Mainly by Women	Exclusively by Women
% increasing <i>skill</i>					
Full-Timers	72 (10)	65 (49)	54 (221)	59 (303)	52 (122)
Part-Timers	—	59 (8)	30 (87)	25 (258)	21 (140)
% increasing <i>responsibility</i>					
Full-Timers	83 (10)	77 (49)	64 (221)	62 (300)	41 (121)
Part-Timers	—	59 (8)	40 (87)	29 (256)	36 (140)

predominantly male occupation have an advantage over other women full-timers in their likelihood of experiencing an increase in responsibility, there remain striking differences when we compare full-timers and part-timers within each category. For instance, where occupations were non-gendered, 64 per cent of women in full-time employment but only 40 per cent of part-timers had experienced an increase in responsibility. Where occupations were mainly 'female', 62 per cent of full-timers compared with 29 per cent of part-timers had seen their responsibility increase. The main persisting disadvantage for women full-timers was in the lower responsibility in work of those in exclusively female settings. But, overall, it seems clear that women's skill experiences are more decisively affected by the prevalence of part-time work than they are by gender segregation.⁴

Conclusion

The central concern of this paper has been to assess a number of conflicting arguments in the literature about the direction of skill change. It has focused in particular on three theses: the 'optimistic' perspective that there has been a generalized upskilling of the workforce, the 'pessimistic' perspective that there has been extensive deskilling and, finally, the view that there has been a growing polarization in the distribution of skills and in the experience of skill change.

Overall, our evidence suggests strongly that those that have argued that there is some pervasive tendency to deskilling either throughout the occupational structure, or in particular occupational classes within it, are mistaken. We found that the experience of deskilling was very rare and this was true for all occupational classes. It was only among those that had been downwardly mobile between social classes that deskilling occurred with any frequency. The evidence was more favourable to the optimistic perspective. It showed that the upward shift in the occupational structure did indeed reflect the expansion of higher skilled jobs, even when a range of different indicators of skill were used. Further, in most occupational classes, the commonest experience has been that of upskilling. This was true not only for the higher level service class positions, but also for lower non-manual workers, technicians and skilled manual workers.

However, a closer examination of the data shows that the argument that is best supported is that of a polarization of skill experiences between classes. The already major skill differentials between the intermediary (let alone the service class) and the non-skilled manual class appear to have been accentuated in the 1980s. Those that already had relatively higher levels of skill witnessed an increase in their skill levels, while those with low levels of skill saw their skills stagnate. The growth of the service sector has clearly been one of the structural factors that has contributed to this. Its

public sector has been a major source of the growth of the service class, while the expansion of its private sector has been associated with the presence of a particularly large and exceptionally low skilled category of non-skilled manual work. The polarization of skills is also closely associated with technological change. Those that have been in a position to use advanced technology in their work have seen their skills increase; those that have not had this possibility, have been much more likely to see their skills remain unchanged. Finally, the evidence points to a deep gender divide in skill experiences. It is men above all that have benefited from the progress of skills in the 1980s, while women are much less likely to have seen their skills increase. The central factor connected with this would appear to be the existence of a major sector of part-time female work, in which the existing levels of skill are typically low and which has remained untouched by the processes that have elsewhere contributed to skill enrichment.

Notes

1. The Initiative is an inter-university research programme in which all of the major research instruments were collectively constructed. The fieldwork was conducted by the Public Attitude Surveys Research Limited.
2. The question wording was: 'I'd like to compare your current job with what you were doing five years ago. For each of the following things, would you say there had been a significant *increase* between then and now, a significant *decrease* or little or no change.
 - the level of skill you use in your job
 - the responsibility involved in your job
3. The relevant tables can be found in D. Gallie (1988) 'Technological Change, Gender and Skill' *Social Change and Economic Life Initiative, working paper no 4*.
4. The aspect of gender segregation considered here is that of 'occupational' segregation by gender. The same analyses were repeated for 'workplace' segregation (the extent to which, at their place of work, women worked primarily with other women). The results were virtually identical. The relevant tables are available in a working paper (see note 3).

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