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"THAT'S NOT MY JOB": DEVELOPING FLEXIBLE EMPLOYEE WORK ORIENTATIONS

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It is widely argued that modern manufacturing settings require employees to adopt a customer-focused strategic orientation and a broad and proactive role orientation. Yet empirical investigation of this issue is lacking. We describe the development of measures of both types of work orientation and present two field studies that examine how these orientations change. Findings suggest that, although the implementation of new production practices can in itself lead to the development of a strategic orientation appropriate to modern manufacturing, change toward a more flexible role orientation additionally requires the introduction of autonomous forms of working.

There can be no doubt that major change is taking place in manufacturing. Traditional priorities and practices, epitomized by mass production, are being challenged by a new paradigm. This is evident from the variety of terms that have recently been coined, such as "lean production" (Womack, Jones, & Roos, 1990), "world class manufacturing" (Schonberger, 1986), "integrated manufacturing" (Dean & Snell, 1991), "time-based flexible manufacturing" (Alasoini, 1993), and "new wave manufacturing" (Storey, 1994). These terms reflect different emphases, but they are bound together by a common heritage and meaning. First, they emerged against the background of worldwide economic recession and the pressure this recession placed on companies to enhance their competitiveness. Second, these terms embody the strategic view that such competitiveness is best achieved through increased responsiveness to customer demand, by controlling costs whilst simultaneously improving quality and tailoring output more specifically to customer requirements. Finally, all represent approaches that rely heavily on enabling technologies and techniques, among which just-in-time (JIT) and total quality management (TQM) are prominent.

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A key question raised by this manufacturing zeitgeist is whether JIT, TQM, and other enabling initiatives are sufficient in themselves to realize the new competitive goals, or whether wider individual and organizational change is also necessary. Opinion strongly supports the latter conclusion. Turnbull, for example, contended that "the organization and management of employees, together with their attitudes, are perhaps the most important (and certainly the most idiosyncratic) resource on which productivity and competitive performance ultimately depend" (1986: 203). Similarly, Taira noted that "inertia" threatens adjustment to the new manufacturing approach because fundamental "change in attitudes, habits and outlook" (1996: 102) is required.

Inherent in what has been a very general debate on the organizational implications of the new manufacturing paradigm are a number of more particular, but as yet largely untested, assumptions. The first of these that is of interest here is that success depends on understanding and internalization by shopfloor employees of the new strategic objectives. In other words, there is an assumption that there is a need for a new *strategic orientation* among employees. This assumption involves a move away from a traditional view that it is sufficient for shopfloor employees to restrict their effort to maximizing volume. Instead, a strategic orientation involves employees' endorsing key strategies such as increased flexibility, the minimization of inventory control, preventive problem solving, continuous improvement, and other principles of modern organizations. If employees do not develop such an orientation, it is unlikely that their efforts will be focused on reducing costs, improving quality, or increasing responsiveness to customers. Linked to this assumption is the view that the development of such a strategic orientation among employees can be achieved in a relatively straightforward way. That is, it is assumed that the implementation of the relevant technologies and techniques combined with the appropriate training and communication will be sufficient to shape employees' strategic beliefs in the anticipated manner (Hayes, Wheelwright, & Clark, 1988). This assumption is consistent with observations made in manufacturing settings that employees endorse strategic views under these conditions (e.g., Taira, 1996) as well as with well-established evidence from social psychological studies that "persuasive communication" can change people's belief structures (Fishbein & Azjen, 1975).

The notion of strategic orientation is particularly significant in that it provides the springboard for the second assumption, that it is also necessary for individuals to generalize that set of beliefs to their own work roles. It is one thing for employees to endorse a set of general organization-wide principles and quite another for them to carry those through to the extent that they change their views of their own work responsibilities. In other words, a clear message in the literature is that change in strategic orientation is not sufficient and that employees also need to develop new and complementary *role orientations*. More specifically, it has been suggested that employees need to embody a broader and more proactive approach to their roles in

which they both own, or feel responsible for, work beyond their immediate operational tasks (an aspect of role orientation that we refer to as ''production ownership'') and recognize the importance of acquiring and using a wide range of skills and knowledge to enable them to contribute at that broader level (an aspect of role orientation we refer to as the ''importance of production knowledge''). This concept of role orientation aligns with Davis and Wacker's (1987) description of roles as opposed to jobs (cf. Ilgen & Hollenbeck, 1991), which they expressed as follows: ''In a narrow 'job-description sense,' one's job is a particular task assignment that may change daily; in a broad 'role' sense, one's job is to help carry out the responsibilities assigned to the team, to participate in team decisions, to cross-train, and to use one's judgment to contribute to the team's productivity, maintenance, and development'' (Davis & Wacker, 1987: 433). Many others have suggested that it is just such change in the ways employees see their own work that is a key element of success in modern manufacturing (e.g., Bratton, 1993; Cummings & Blumberg, 1987; Hayes et al., 1988; Lawler, 1992, 1994; Parker, Mullarkey, & Jackson, 1994; Tailby & Turnbull, 1987; Zammuto & O'Connor, 1992).

Associated with the above views, however, is a further assumption of key interest in this article; that the required role orientation will only develop if employees are also given more autonomy over their work. It has long been recognized that tightly defined jobs with low autonomy tend to encourage narrow perspectives in their incumbents. Baldamus, for instance, described how exposure to highly repetitive jobs creates a state of traction (or inertia) that operators then seek to maintain: ''He [the operator] will strive to obtain a job where traction is relatively strong and interferences to traction small. He will also tend, normally, to take the external situation for granted . . . to follow the line of least resistance'' (1961: 65). More recently, Karasek and Theorell noted that frequently observed responses, such as ''That's not my department'' and ''It's not good to rock the boat around here,'' reflect a narrow role orientation that derives from ''learned responses to early job experiences in which taking initiative and using extra skill and judgment were severely penalized as overstepping the bounds of one's (unnecessarily restricted) authority'' (1990: 174). Many others have commented on the narrowing effect a lack of autonomy has on people's perceptions of their work roles (e.g., Bruggeman, Groskurth, & Ulich, 1975; Frese, 1982; Wood, 1990). These observations lie behind the repeated calls for the implementation of high involvement or empowerment strategies in support of modern manufacturing (e.g., Buchanan & McCalman, 1989; Lawler, 1992, 1994; Susman & Chase, 1986; Taira, 1996; Zammuto & O'Connor, 1992). Aktouf, for example, argued that ''the Tayloristic vision of employees as a cost factor and a passive cog has now become a liability that must be discarded as quickly as possible to make room for a humanistic vision, whereby the employee is seen as an active and willing participant in the organization'' (1992: 426). Similarly, Bratton suggested that management should ''treat employees as a valued asset rather than a variable cost, see training and development as an asset,

and view empowerment and high trust employment relations as prerequisites to recruit and retain an effective and committed workforce'' (1993: 398).

In short, a relatively coherent set of assumptions can be discerned. First, that the implementation of the new manufacturing practices will require and result in a change in strategic orientation among production employees and that this change will be facilitated by parallel efforts to enhance people's understanding of the new practices through processes such as communication and training. Second, that the success of the new approach will depend on a compatible change toward a broader role orientation on the part of shopfloor employees and that the development of that orientation will require the implementation of more autonomous forms of work organization.

Although the above assumptions may be plausible, they remain virtually untested. Moreover, they are not universally held. Some commentators believe that the new manufacturing initiatives will not result in the development of a more flexible work orientation by virtue of their intensification and de-skilling effects (e.g., Delbridge, Turnbull, & Wilkinson, 1992). Thus, these assumptions call out for empirical investigation. In this article, we focus on the facilitation of change in work orientations and investigate these basic propositions: (1) The introduction of new manufacturing initiatives, when accompanied by efforts to increase employee understanding by such means as communication and training, will lead to the development of a more appropriate strategic orientation among employees. And (2) efforts to increase understanding about new manufacturing initiatives will not be sufficient to allow employees to develop a broader and more proactive role orientation; such change additionally requires an increase in job autonomy.

This need for systematic research, however, highlights a particular difficulty. Despite the importance of strategic and role orientations within the debate on modern manufacturing, little attempt has been made to develop appropriate measures of either construct. Research has continued to focus on traditional affective-reaction outcome measures, such as job satisfaction and strain. Thus, the first step was to determine if strategic and role orientation could be measured. Only then would it be possible to move on to test propositions about whether these orientations change as a result of the introduction of modern manufacturing practices and more autonomous forms of work organization. The present article describes a sequence of three studies that followed this path.

STUDY 1: THE MEASUREMENT OF WORK ORIENTATION

The aim of the first study was to develop appropriate measures of work orientation. We set ourselves the goal of producing scales with good internal reliability for which we could demonstrate some initial construct validity. One of the major difficulties was that the discussion of work orientation in the relevant literature so far has been at a very general and ill-defined level. Thus, the starting point was to clarify the basic construct of work orientation and the major dimensions of relevance.

The Construct of Work Orientation

The general construct of orientation is related to such existing concepts as personal constructs (Kelly, 1955), schemata (Bartlett, 1932), and belief structures (Sproull, 1981), all of which are based on an underlying assumption that people have different constructions of the world and that these differences are meaningful. The concept of work orientation thus has a clear emphasis on how people construe their work roles and work environments, rather than on their affective reactions to the job or environment; concepts like job satisfaction and psychological well-being tap such reactions. Essentially, work orientation taps the cognitive or belief component of work attitudes rather than the affective component. The concept of work orientation can also be distinguished from the sociological construct of orientation toward "work in general" (Goldthorpe, Lockwood, Bechhofer, & Platt, 1968) by its focus on people's constructions of their work within a specific context. Work orientation is nevertheless broader than the specific skills and knowledge that are required for successful task performance, such as those included in an expert system model; knowledge of how to prevent a fault in a particular system is an example. Work orientation is also different from such concepts as proactive personality (Bateman & Grant, 1993) and higher-order need strength (Hackman & Oldham, 1976), which are assumed to be relatively stable personal dispositions. We argue that work orientations can change and develop in response to change in the external environment.

The concept of work orientation requires a referent, and in this case our referent was modern manufacturing. As discussed earlier, at least two types of work orientation are important in this context: strategic orientation and role orientation. These aspects and their relevance within modern manufacturing are described further.

Strategic orientation, the first type of work orientation, concerns employees' understanding and general acceptance of principles that derive from broader strategic objectives. For example, accepting the principle of learning new and different tasks is important if a company has a strategy of increasing flexibility. This concept of strategic orientation is particularly important within modern manufacturing as many of the strategies are based on principles that are fundamentally different from those inherent in traditional manufacturing. For example, Oliver and Davies (1990) described case studies of the implementation of cellular manufacturing and just-in-time in which problems occurred because the principles underlying these initiatives did not align with past assumptions (such as the modern principle that production is pulled by demand rather than pushed by resource capacity). Employees equated a stock of unfinished work with job security, so that the absence of a stock of visible work-in-progress was very threatening. Oliver and Davies suggested that what is required is not just a change in work practices but a change in thinking, from "just-in-case thinking to just-in-time thinking" (1990: 564). That is an example of what we mean by strategic orientation. Employees need to change the way they construe their work

environments in a way that is consistent with the relevant organizational strategies.

The second type of work orientation, role orientation, is related to strategic orientation in that much of the change in work roles results from the introduction of new organizational strategies. For example, the need for shopfloor employees to adopt the idea of relating to customers arises out of the need for greater responsiveness to customer demand. An understanding of the latter strategy will naturally facilitate the development of new role views. Nevertheless, although strategic orientation is about the general understanding of new strategies, role orientation is more explicitly concerned with people's actual acceptance of the effects of the strategies on their daily work activities. Thus, role orientation (or role perception, as Porter and Lawler [1968] called a similar construct), is defined in terms of the problems, tasks, and competencies an individual sees as relevant to his or her work role and effective performance of that role. Role orientation can thus be seen to represent the psychological boundary of a role. Note that our focus is on those problems, tasks, and competencies that an individual could reasonably be expected to include as part of his or her role, given the opportunities within the environment. Concepts such as organizational citizenship refer explicitly to behaviors that go beyond role requirements, such as volunteering for extra activities, sportsmanship, and civic virtue (Bateman & Organ, 1983).

We consider role orientation as having two aspects. The first, *production ownership,* concerns the work problems and goals that someone "owns" or feels responsible for. For example, an employee who sees his or her role exclusively in terms of operating a designated machine has narrow production ownership. By contrast, a much broader role orientation, or high production ownership, would be indicated by that individual's also feeling concern for high product quality, customer satisfaction, and working as part of a team. The second way of conceptualizing role orientation is the extent to which employees recognize the importance of gaining and using a wide range of skills and knowledge in order to perform effectively. Thus, a narrow role orientation is shown by someone who sees the most important performance requirement as "doing what I am told," and a broader, more proactive role orientation is shown by someone who recognizes that key competencies of a role include, for example, working effectively in a team and using personal initiative to prevent problems. We refer to this second aspect of role orientation as the *importance of production knowledge.*

In summary, we have conceptualized work orientation as a construct that includes at least two dimensions: people's beliefs about strategies that exist within their work environments (strategic orientation) and their beliefs about the boundaries of their specific work roles (role orientation). In turn, role orientation has two facets: production ownership and the importance of production knowledge. We turn now to the development of measures to assess strategic orientation and the two dimensions of role orientation.

Development of Scales to Assess Work Orientation

Stage 1: Item selection and content validity. We generated a large number of items from reading materials and from interviews with those involved in new and traditional manufacturing initiatives. Three raters then independently sorted the items into the categories of work orientation: strategic orientation, production ownership, and the importance of production knowledge. They were also asked to sort the role orientation items into further subcategories that we identified in the literature to ensure the concepts were adequately covered (these subcategories are explained below). We retained only items that were consistently coded and excluded those that duplicated others. To determine interrater agreement in the assignment of items, we calculated Cohen's (1960) kappa coefficient using the HANDY KAPPA program (Jackson, 1983). Kappa values were all greater than .60, the recommended minimum level (cf. Hill, 1991), and most were greater than .75, the median being .87. These results show the items were reliably assigned to the categories. *Z*-scores resulting from testing the hypothesis of no-more-than-chance agreement (Fleiss, 1971) were all statistically significant, showing that assignment to categories was significantly better than chance. Efforts were also made to ensure there were no gaps in covering the construct domain.

Stage 2: Scale formation and description. The items selected from stage 1 were summed to form a scale of strategic orientation and two scales to assess production ownership and the importance of production knowledge. The Appendix shows the full item wordings for each scale. Our focus was on ensuring that the measures adequately covered the domain of the construct, as established in stage 1. The scales and the instructions given to respondents were as follows:

Strategic orientation was tapped by a ten-item scale assessing endorsement of key modern manufacturing principles. Respondents were asked to rate, on a five-point scale, the extent of their agreement or disagreement with statements about relevant principles, such as inflexibility, preventive problem solving, inventory control, JIT production, and employee performance. All key principles relevant to the context were assessed with at least one item. An example (item 5) is: "It is important to keep making products, even if they go to stock rather than directly to customers," where disagreement with the statement is taken as showing an understanding of JIT principles. Because the items deliberately tapped a level of awareness and understanding of the principles, items were worded as the antithesis of the target belief, so that the "wrong" answer would seem plausible to people who did not have strong views or understanding. We summed ratings on the total set of items (with items reverse-coded) to obtain a score for strategic orientation.

The scale for the *production ownership* aspect of role orientation measures the range of production problems that people feel that they "own." Respondents were asked to indicate the extent of their personal concern

about the occurrence of each of nine problems on a scale ranging from 1 (to no extent) to 5 (to a large extent). A sample item is: "To what extent would it be of concern to you if the quality of products in your area was low?" To legitimize perceptions of nonconcern, the instructions stated that some problems might not be of concern to respondents but might rather belong within the domain of supervisors or managers. In developing the scale, we focused on three categories of problems, *goal achievement* (e.g., slow delivery times, customer dissatisfaction, poor product quality), *operational inefficiencies* (e.g., large amount of rework and in-progress inventory), and *work group cohesion and coordination* (e.g., conflicts, selection of new members, lack of skills).

The scale measuring the *importance of production knowledge,* the second aspect of role orientation, assesses whether employees recognize the importance for their effective performance of a broad range of skills, knowledge, and behavior. We focused on five categories of competencies that our experience and reading suggested are important for high performance in modern manufacturing: *cognitive activities* (e.g., anticipating problems, finding the root cause), *team working* (e.g., resolving conflicts, sharing ideas), *knowing local production requirements* (e.g., knowing how to schedule work, knowing work priorities), *understanding of wider manufacturing* (e.g., knowing company objectives), and *self-direction* (e.g., being self-motivated, using initiative). At least two items were developed to assess each of these categories, with a total for the scale of 15 items. A sample item is: "For you to perform effectively, how important is it to know about the whole production process?" Responses were on a scale ranging from "not at all important" (1) to "extremely important" (5).

Empirical Investigation of Reliability and Construct Validity

The empirical investigation had two aims: to establish basic psychometric properties and to provide a test of construct validity.

To enable the test of construct validity, we carried out the study within a traditional manufacturing company. A minimum requirement of work orientation measures is that they distinguish between staff members (i.e., supervisors and specialist staff) and shopfloor employees within a traditional manufacturing company. In such environments, employees have simple jobs with minimal autonomy in which they are expected to have concern only about their immediate day-to-day tasks. Staff members, in contrast, typically have jobs that involve decision-making, planning, and problem-solving elements. They are expected to show awareness and interest in the broader production process, as well as a more forward-thinking approach to production issues. Within modern manufacturing organizations, shopfloor employees, or operators, are essentially required to develop work orientations that resemble those traditionally held by supervisors. If the orientation measures do not discriminate between staff and employees within a traditional setting, they are unlikely to be sensitive to the changes in orientation for operators in modern manufacturing environments. The test of construct validity was thus

that, within the traditional manufacturing company at which the test was conducted, the work orientation scores of staff members should be significantly higher than those of operators.

Methods. The study took place within the production department of a medium-sized engineering company (about 200 employees) in the north of England. Although the company had introduced several new manufacturing methods to facilitate adjustment to market demands, it still operated under a traditional paradigm. The new methods it used were customer audits of quality, a computer-controlled production scheduling system (MRP-II), and the gradual introduction of single-operator machining cells. However, these changes did not involve any of the key features of JIT and TQM, were introduced in a nonstrategic manner, and were implemented with minimal emphasis on human resource issues. Only staff members were involved in discussions about changes, and even this involvement was limited. Employees had no training about the new initiatives, and there was no systematic means of communication. Moreover, the company introduced the changes whilst maintaining a traditional form of work organization based on Taylorist principles: machine operators had no influence over the scheduling of work, product designs, or the programming of CNC (computer numerically controlled) machines; quality inspection, machine set-up, and maintenance were carried out by separate shopfloor employees. Foremen performed a traditional supervisory role (e.g., coordinating work, allocating jobs), and production planners determined the scheduling of work and the routing of parts throughout the process.

Seventy-one employees completed questionnaires on their own time and handed them back to the researcher, who was one of the authors. All employees received feedback on the results. Complete data on all the key measures were received from 44 shopfloor employees and from 16 staff members, including 7 foremen, 5 production planners, and 4 production engineers. All respondents were men.

Results. The study showed that the scales have adequate psychometric properties. Estimates of internal reliability (Cronbach's alpha) were as follows: strategic orientation, .79, production ownership, .94, and importance of production knowledge, .93. These coefficients are all greater than .70, suggesting that the items within each scale are tapping the same construct and that each scale is sufficiently highly intercorrelated to be considered internally reliable. For each scale, the removal of any single item did not substantially increase the alpha coefficient, indicating that all items should be retained. The distributions of scores for the scales were not skewed and, as indicated by the mean scores, there were no ceiling or floor effects (strategic orientation, $\bar{x} = 3.43$, s.d. = 0.95; production ownership, $\bar{x} = 3.38$, s.d. = 1.10; and importance of production knowledge, $\bar{x} = 3.52$, s.d. = 0.89).

The work orientation measures were moderately related to one another, suggesting they tapped similar but not identical constructs. The correlation between the two role orientation measures, production ownership and the importance of production knowledge, was .59 ($p < .01$). The correlation

between strategic orientation and production ownership was .52 ($p < .01$), and the correlation between strategic orientation and the importance of production knowledge was .37 ($p < .01$). It should be noted at this point that in the subsequent studies correlations between the role orientation scales and strategic orientation did not exceed .45. Correlations between the two role orientation scales were generally greater (from .30 to .66), but these values are not likely to be problematic, given the high reliability of these scales.

At this stage, we should have performed a full factor analysis to examine the independence of the measures and to determine the appropriateness of the items within each measure. However, such an analysis was not possible in the current study (and in the subsequent studies) because of the small size of the sample. Our research approach was to conduct a set of well-defined studies that together lent support for the theoretical propositions rather than to conduct large-scale and less focused studies. Thus, we conducted a partial investigation of the independence of the measures by comparing the correlation between each item and the sum of the remaining items in that scale (the corrected item-total correlations) to the correlations between each item and the other scales.

Results of this analysis, which are shown in Table 1, provide evidence that the measures are independent from each other. As can be seen, the mean corrected item-total correlations are all above .45 and are higher than mean

TABLE 1
Corrected Item-Total Correlations[a]

	Strategic Orientation			Production Ownership			Importance of Production Knowledge		
Item	Item-Total	Item-PO	Item-IPK	Item-Total	Item-IPK	Item-SO	Item-Total	Item-PO	Item-SO
1.	.60	.32	.00	.79	.48	.37	.72	.23	.39
2.	.63	.30	.11	.76	.26	.23	.53	.23	.06
3.	.35	.25	.00	.75	.26	.28	.71	.46	.30
4.	.71	.30	.18	.72	.64	.32	.86	.54	.27
5.	.37	.09	.04	.77	.52	.30	.75	.52	.28
6.	.33	.15	.16	.66	.37	.31	.64	.44	.26
7.	.31	.28	.19	.63	.54	.32	.81	.54	.27
8.	.44	.37	.32	.79	.53	.45	.77	.48	.19
9.	.48	.36	.43	.73	.48	.47	.78	.52	.34
10.	.51	.44	.32				.49	.40	.19
11.							.44	.32	.12
12.							.57	.44	.01
13.							.72	.43	.26
14.							.57	.38	.58
15.							.63	.45	.42
Mean *r*	.48	.27	.18	.73	.45	.34	.67	.44	.26

[a] PO = production ownership, IPK = importance of production knowledge, and SO = strategic orientation.

correlations of items with the other scales. For example, each production ownership item is correlated at a level greater than .60 with the total scale (mean r = .73), and these items have lower correlations with the strategic orientation scale (mean r = .34) and with the importance of production knowledge scale (mean r = .45). In addition, as would be expected, since these are both measures of role orientation, there are higher item-scale correlations between production ownership and the importance of production knowledge than between either of these measures and strategic orientation.

Turning to the test of construct validity, we expected that staff members (supervisors and specialists) would have significantly higher scores on the work orientation scales than shopfloor employees. The data supported this expectation (see Table 2). Staff members scored significantly higher than shopfloor employees on strategic orientation ($p < .001$), production ownership ($p < .001$), and importance of production knowledge ($p < .001$). These findings suggest that the work orientation measures fulfill the minimal requirement of distinguishing between staff members, who have broader, more autonomous jobs and greater exposure to strategic principles, and operators, who have traditional narrow jobs and limited exposure to information about strategies. (Note that we found consistent results when we compared the work orientation scores of supervisors and operators for the sample in study 2, which is reported below.)

In addition to the above validity check, there was a clear convergence between the questionnaire results and the interviews conducted with shopfloor employees. Their comments revealed a reactive, accepting attitude to problems (e.g., "You're bound to scrap an odd one occasionally, it's inevitable like") and nonstrategic perspectives on production goals and initiatives (e.g., seeing customers as "just names on sheets"). They also had a narrow focus on the immediate set of tasks (e.g., "I'm responsible for turning my work out and making sure it's turned out properly. That's about it really"), consistent with their low role orientation scores. The newly developed

TABLE 2
Group Means and Comparisons, Study 1[a]

Variable	Shopfloor Employees	Staff Members	t[b]
Strategic orientation	3.24	3.93	−4.11***
	(0.63)	(0.37)	
Role orientation: Production ownership	3.06	4.22	−4.04***
	(1.01)	(0.86)	
Role orientation: Importance of production knowledge	3.22	4.34	−5.21***
	(0.85)	(0.23)	

[a] For shopfloor employees, n = 44; for staff members, n = 16. Standard deviations are in parentheses.

[b] df = 55–58.

*** $p < .001$

scales thus appear to function as viable indicators of rich and fundamental views elicited in interviews.

Summary of Study 1

New measures to assess the constructs of strategic orientation and role orientation were developed. In an initial study, the strategic orientation scale and the two scales measuring role orientation (production ownership and the importance of production knowledge) were shown to be internally reliable and to fulfill the minimal requirement of distinguishing between members of different role groups. There was thus sufficient evidence that the orientation measures were adequate for the purpose of proceeding with further studies.

We now turn to the key issue of concern in this article: the investigation of change in work orientation occurring as a result of the introduction of new manufacturing initiatives.

STUDY 2: A NEW MANUFACTURING INITIATIVE WITH NO CHANGE IN EMPLOYEE AUTONOMY

This study was a longitudinal examination of the effects on employees' work orientation of a company's introduction of a JIT-TQM initiative that was accompanied by attempts to increase employees' understanding of strategic principles through such means as training and communication but that did not involve any change in employees' autonomy. As discussed earlier, under these circumstances we would expect a change in strategic orientation, but not one in role orientation.

The study took place within the assembly section of a company that designs and manufactures vehicle seats and seat mechanisms for car manufacturers in the United Kingdom and Europe. To improve its responsiveness to customer demands, the company had reorganized production into ten product-based cells. However, to achieve a high level of performance with minimal yearly price increases, management decided to implement further aspects of JIT and TQM within the assembly area of the production cells. The main focus of the initiative was to use operator expertise to attack and remove non–value-added activities—those that did not directly contribute to the finished product—within the production process. Doing this involved training employees in principles and methods of JIT (the training package was modeled on the Toyota production system described by Monden [1983]) and involving representative employees in the process of redesigning work flows to remove waste.

Interviews and observation suggested that, prior to the introduction of the initiative, operators did not work flexibly and control was concentrated in the hands of line and cell leaders. With the exception of involving some employees in planning the changes, management neither intended nor attempted to increase employee autonomy with the introduction of the JIT-TQM initiative. There was no change in the section's authority structure or in other key aspects of work, as shown by this comment from an assembler

who had experienced the changes: "My job is still the same as it always has been with the exception of a little less room in some areas and a little more in others."

The initiative was introduced in two stages. We took two sets of measures, six months apart, and began our assessment at a point when some employees (the "early change group") had started the initiative but others (the "later change group") had yet to start. The group of primary interest was the later change group (n = 20), whose members were surveyed both before and after the initiative was introduced in their work area. The early change group (n = 15) provided a natural comparison. Table 3 shows the relationship between the timing of interventions and the measurement points.

Hypotheses

We have argued that change in strategic orientation is not dependent on enhanced autonomy but develops as a result of organizational attempts to increase employee understanding and acceptance of new initiatives. Given that the specific initiative studied involved continual employee training and communication, our first hypothesis was that there would be significant increases in strategic orientation scores for the later change group. As the early change group continued to receive communication and training in JIT-TQM principles, we also predicted an increase in scores for these employees.

Our secondary hypothesis was that if general exposure to information about JIT-TQM and its principles serves to enhance people's strategic awareness, then those employees exposed to change for the longest time (i.e., the early change group) should have higher scores on strategic orientation than the later change group. These hypotheses are summarized as follows:

> *Hypothesis 1a. There will be significant increases in strategic orientation scores for both the later change group and the early change group.*
>
> *Hypothesis 1b. The early change group, having experienced the JIT-TQM initiative longer, will have significantly higher strategic orientation scores than the later change group.*

TABLE 3
Design of Study 2: Introduction of a JIT-TQM Initiative without Enhanced Autonomy[a]

	Month									
Group[b]	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Early change group	X			O						O
Later change group				O			X			O

[a] X = introduction of the initiative; O = a measurement point.
[b] Early change group n = 15; later change group n = 20.

Given that the introduction of the JIT-TQM initiative did not involve increased autonomy (and we conducted analyses to check this), there was no reason to expect an increase in role orientation scores for the later change group. Similarly, there was no reason to expect that the role orientation scores of the early change group would be higher than those for the later change group.

Methods

Measures. Employee work orientation was assessed using scales of *strategic orientation, production ownership,* and the *importance of production knowledge* as in the initial study, with the wording of items adapted to customize them for the specific context of the company used as the site of study 2 (see the Appendix). The mean alpha coefficients across the two time points were .80 for strategic orientation, .80 for production ownership, and .87 for the importance of production knowledge. The correlation between the two measures of role orientation, production ownership and the importance of production knowledge was .30 ($p < .01$) at time 1 and .50 ($p < .01$) at time 2. The correlation between production ownership and strategic orientation was .39 ($p < .01$) at time 1 and .35 ($p < .05$) at time 2. The correlation between the importance of production knowledge and strategic orientation was .17 at time 1 and .06 at time 2.

Jackson, Wall, Martin, and Davids's (1993) measures of job control developed especially for production environments were used to examine the effects of the initiative on autonomy. Timing control assesses the extent to which an individual has the opportunity to determine the scheduling of his or her work, and method control assesses the extent to which an individual has choice in how to carry out tasks. These scales were shown to have adequate internal reliability and test-retest reliability and to discriminate between different jobs in two samples (Jackson et al., 1993). In this study, we combined the scales to form one more parsimonious scale, which we labeled *task control.* Cronbach's alpha coefficient of internal reliability, averaged over the two measurement periods, was .81. An additional eight-item measure of autonomy, *boundary control,* was also used. This measure assesses the extent to which people have control over boundary activities, such as carrying out routine maintenance and selecting new employees. The average alpha coefficient of the scale within the current study was .80.

Procedures and sample. Questionnaires were administered by the researchers to small groups of employees during work hours. Confidentiality was emphasized, and the study was described as an independent evaluation of the effects of the JIT-TQM initiative. Response rates were high (approximately 80 percent at each measurement occasion). There were 35 employees who had complete data at both periods, 15 in the early change group and 20 in the later change group. The mean age of respondents was 36.8 years; their mean length of time in the company was 4.3 years; and their mean length of

time in their current job was 2.7 years. All respondents were men. There were no statistically significant differences between the groups with regard to these demographic variables.

Results and Discussion

As expected, the JIT-TQM initiative did not affect levels of employee autonomy. That is, there were no significant increases in perceptions of task control or boundary control for either group. The predictions outlined earlier thus stand.

Table 4 shows means and standard deviations for all work orientation variables at each time and results of repeated-measures analyses of variance for each dependent variable. Simple effect analyses, which examine change over time separately for each group, were considered most appropriate since we made precise predictions about the patterns of change expected for each group. We used one-tailed tests since the hypotheses concerned change in a specified direction.

The main hypothesis (Hypothesis 1a) was supported. Strategic orientation scores significantly increased within both the early change group ($p < .001$) and the later change group ($p < .05$).

Hypothesis 1b was supported in that the early change group had higher strategic orientation scores than the later change group at both measurements (although these differences were only significant at time 2). Similarly, as would be expected, the increase was greater within the early change group (which had already had some exposure to the JIT-TQM initiative before the study's first measurement point) than for the later change group (which experienced this initiative during the course of the study). Taken together,

TABLE 4
Means and Simple Effect Tests of Work Orientation, Study 2[a]

	Later Change Group			Early Change Group		
Variable	**Time 1**	**Time 2**	**F^b**	**Time 1**	**Time 2**	**F^b**
Strategic orientation	3.08	3.22	3.58*	3.32	3.71	20.24***
	(0.70)	(0.62)		(0.62)	(0.63)	
Role orientation: Production ownership	3.07	3.08	<1	3.22	3.45	1.34
	(0.79)	(0.76)		(1.07)	(1.04)	
Role orientation: Importance of production knowledge	3.74	3.56	4.57[c]	3.76	3.54	4.95[c]
	(0.55)	(0.46)		(0.48)	(0.46)	

[a] Later change group $n = 20$; early change group $n = 15$. Standard deviations are in parentheses.

[b] $df = 1, 33$.

[c] Since the hypotheses only concerned an increase in scores, these changes were not significant. With a two-tailed test, they would be significant with an alpha of .01.

* $p < .05$, one-tailed test

** $p < .01$, one-tailed test

*** $p < .001$, one-tailed test

these results suggest that the increase in strategic orientation scores relates in some way to the introduction of the JIT-TQM initiative rather than simply reflecting a testing effect.

Regarding change in role orientation scores, consistent with our expectations, there was no significant increase for the later change group. More specifically, there was no change in production ownership and a significant decrease in the importance of production knowledge ($p < .01$). Also consistent with the framework, there were no significant differences between the early change group and the later change group on either role orientation measure at time 1 or time 2.

Thus, the implementation of this manufacturing initiative led to the development of a strategic orientation more appropriate to modern manufacturing. However, the results obtained were consistent with the view that employees experiencing the initiative but no change in autonomy would not develop a broader, more proactive role orientation. Indeed, their scores on the importance of production knowledge decreased, indicating they attached less importance to various skills and types of knowledge that would enable high performance; this outcome probably reflects the intensification and narrowing of jobs reported in interviews by some operators.

Thus far, results are consistent with the general proposition that strategic change involving attempts to increase employee understanding can bring about the development of a more appropriate strategic orientation and are also consistent with the proposition that change in autonomy is needed for change in role orientation. However, to test the latter proposition more fully, we needed evidence from an organization in which strategic change was combined with the introduction of more autonomous jobs. The next section presents such a case.

STUDY 3: A NEW MANUFACTURING INITIATIVE INVOLVING ENHANCED AUTONOMY

This study examined the effect of the introduction of a JIT-TQM initiative that, for most production employees, was accompanied by enhanced autonomy. We thus expected to see the development of a broad, proactive role orientation as well as a more appropriate strategic orientation for these employees. For some comparison groups of employees, alternative outcomes were predicted.

The study was conducted in an American-owned electronics company in the United Kingdom that designed and produced control equipment for use in process industries. The company was medium-sized, with about 170 employees in manufacturing. It had been under increasing pressure from customers to improve quality and reduce delivery times without increasing the cost of products. The company had thus introduced a series of manufacturing initiatives. Our focus was on the production department, where there were about 65 employees directly engaged in making and testing printed circuit boards and assembling these into customized control sys-

tems. The work was characterized by the production of small batches of a wide variety of products (about 230 product types). The first initiative to affect these employees was the introduction of TQM. All employees attended training courses, and great emphasis was put on getting products "right the first time." This training was followed by a pilot project, the introduction of a product cell. In a product-cell system, employees are grouped into product-based rather than functional cells in order to facilitate the smooth flow of products that is necessary for JIT production. The success of the pilot project then led the organization to introduce product cells across the whole shopfloor. This study focused on the introduction of product cells, an initiative that was an extension of TQM and the first phase of JIT within the company.

In contrast to the initiative in previous study, this JIT-TQM initiative integrally involved devolution of control to employees. Autonomous work teams were formed around the product cells, and multiskilled employees were given the authority to manage day-to-day activities involved in meeting production targets. Quality inspection became the responsibility of the team, and those originally employed as inspectors became a separate group of "quality auditors" who monitored processes rather than products. Responsibility for testing was also devolved to the team although, in contrast to quality personnel, the highly skilled test engineers were integrated into product-cell teams and were expected to become multiskilled. Teams developed their own publicly displayed charts of their work schedules, primary performance indicators, and skill matrixes; they also recorded their own absence data. The extent of autonomy was similar to that in the high-performance work teams described by Buchanan and McCalman (1989) and recommended by others (e.g., Lawler, 1992).

Overall, the adoption of the JIT-TQM initiative proved very successful for the company. Lead times were reduced from 14 weeks to two days; inventory costs were reduced to 20 percent of the initial costs; delivery integrity (meeting customer delivery dates) was improved from 50 percent to 97 percent, and quality (monitored in terms of zero-defect boards and quality yield) was substantially improved.

Three groups within the sample are of specific interest here. The first group is the pilot enrichment group ($n = 7$), which consisted of employees who were reorganized into the pilot project product cell. The reorganization meant a substantial change in their work roles, including an increase in autonomy. The second group, the main enrichment group, consisted of operators previously in conventional jobs who were formed into autonomous work groups over the period of the study ($n = 32$). The third group, the de-skilled specialist group, consisted of specialist test engineers whose prior skilled role was impoverished by the movement to product-cell teams ($n = 7$). The test engineers were integrated into the product cells and expected to undertake a broader range of tasks, but in practice this meant they worked with a narrower range of products and had less opportunity to use their technical skills. Table 5 shows the design of the study.

TABLE 5
Design of Study 3: Introduction of a JIT-TQM Initiative with Varied Effects on Autonomy[a]

	Month									
Group[b]	0	3	6	9	12	15	18	21	24	27
Pilot enrichment group	X_1	O								O
Main enrichment group		O	X_1							O
De-skilled specialist group		O	X_2							O

[a] X_1 = introduction of the JIT-TQM initiative, with enhanced autonomy; X_2 = introduction of the initiative with de-skilling of jobs. O = a measurement point.

[b] Pilot enrichment, n = 7; main enrichment, n = 32; de-skilled specialist, n = 7.

Hypotheses

We expected that each group would develop a strategic orientation more appropriate to the new manufacturing methods as all employees received education and communication relevant to the initiative during the course of the study. Nevertheless, we also expected that, at the start of the study, members of the pilot enrichment group would have a more appropriate strategic orientation than those in the main enrichment group. At this time, employees in the pilot group had already been extensively involved in setting up the product cell and had received substantial training. For example, in the early stages of the team's development, engineers, supervisors, and managers worked closely with team members to coach them in the new ways of working. Thus,

> *Hypothesis 2a. There will be an increase in strategic orientation scores over time for all groups.*
>
> *Hypothesis 2b. At time 1, employees in the pilot enrichment group will have significantly higher strategic orientation scores than those in the main enrichment group.*

In relation to role orientation, we made the following more precise predictions: We expected no change over time in role orientation for the pilot enrichment group and for the de-skilled specialist group, because no change in autonomy occurred during the measurement span of the study for either group; and we predicted an increase in role orientation scores for the main enrichment group following the enhancement of autonomy that occurred after the first measurement. Further, since members of the pilot enrichment group were already working as a semiautonomous team prior to the first measurement occasion, we predicted that role orientation scores would be higher at time 1 for this group than for the main enrichment group. Thus,

> *Hypothesis 3a. There will be an increase in role orientation scores for the main enrichment group but not for the pilot enrichment group or the de-skilled specialist group.*

Hypothesis 3b. At time 1, employees in the pilot enrichment group will have significantly higher role orientation scores than those in the main enrichment group.

Methods

Measures. We assessed employee work orientation by scales measuring strategic orientation, production ownership, and the importance of production knowledge in the same way as in the previous studies, allowing for contextual variations (see the Appendix for the slight variations in specific item content). We estimated internal reliabilities using Cronbach's alpha coefficient and averaged these over time 1 and time 2. Mean reliabilities for strategic orientation, production ownership, and the importance of production knowledge were .72, .88, and .87, respectively. The correlation between the two measures of role orientation (production ownership and the importance of production knowledge) was .66 ($p < .01$) at time 1 and .31 ($p < .05$) at time 2. The correlation between production ownership and strategic orientation was .42 ($p < .01$) at time 1 and .29 ($p < .05$) at time 2. The correlation between the importance of production knowledge and strategic orientation was .23 ($p < .05$) at time 1 and .26 ($p < .05$) at time 2. Autonomy was assessed by the same task control and boundary control scales used in study 2. Mean internal reliabilities were .82 and .72 for task control and boundary control, respectively.

Procedures and sample. Questionnaires containing the above measures were administered on two occasions. Time 1 occurred after the pilot group had been formed but before product cells were put in place in the rest of the assembly area. Time 2 occurred 23 months after the first measurement. In each case, members of the research team administered questionnaires to small groups of employees (up to 15 at a time) during work hours, and confidentiality was emphasized. Response rates were high (at least 80 percent) for each administration. Sixty-three employees completed the survey at time 1, and 53 employees completed it at time 2. However, not all employees were available at both times because of holidays, illness, turnover, or production pressures. The final sample used here consists of 46 individuals who provided complete data on all variables on both measurement occasions.

The mean age of respondents was 34.6 years, and their mean length of time in the company was 3.6 years. No significant differences were found between groups on either variable. The sole demographic difference was on gender: the proportions of women in the pilot enrichment group and the de-skilled specialist group were much lower (30% and 20%, respectively) than that in the main enrichment group (70%).

Results

This section has three parts. First, we examine changes in autonomy in order to check our assumption that the introduction of product-cells and autonomous work groups did result in an increase in worker autonomy for

the enrichment groups. Second, we consider patterns of change and group differences in strategic orientation. Finally, we look at results for the role orientation scales. A separate repeated-measures analysis of variance was conducted for each variable. The statistical tests used were simple effect tests of change over time for each group. One-tailed tests were used since the hypotheses concerned change in a specified direction.

As expected, the only group to report an increase in autonomy over the time frame of the study was the main enrichment group. In this group, there was a significant increase in scores for both task control ($p < .001$) and boundary control ($p < .001$). There was no significant change in autonomy for the pilot enrichment group (for whom jobs were changed before the first measures were taken), although, as expected, the pilot enrichment group reported significantly higher task control ($p < .01$) and boundary control ($p < .001$) than the main enrichment group at time 1. There was no significant increase in autonomy for the de-skilled specialist group. Indeed, examination of the means for this group showed a general decrease in scores.

Having shown that the manufacturing initiative affected levels of employee autonomy in the expected way, we turn now to results for the major hypotheses. Table 6 reports group means and standard deviations for all work orientation variables at each measurement time.

The findings for strategic orientation give partial support for the expectation of an increase in scores on this aspect for all of the groups (Hypothesis 2a). There was a significant increase over time for the main enrichment group ($p < .01$) and for the de-skilled specialist group ($p < .05$). For the pilot

TABLE 6
Means and Simple Effect Tests of Work Orientation, Study 3[a]

Variable	Pilot Enrichment Group			Main Enrichment Group			De-skilled Specialist Group		
	Time 1	Time 2	F[b]	Time 1	Time 2	F[b]	Time 1	Time 2	F[b]
Strategic orientation	3.44 (.37)	3.51 (.37)	<1	3.14 (.47)	3.42 (.59)	8.93**	3.54 (.40)	3.91 (.35)	3.31*
Role orientation: Production ownership	4.32 (.64)	4.19 (.76)	<1	2.67 (.81)	3.41 (.93)	16.83***	3.41 (.48)	3.68 (.78)	<1
Role orientation: Importance of production knowledge	4.03 (.68)	4.13 (.76)	<1	3.27 (.69)	3.70 (.57)	17.97***	3.71 (.74)	3.51 (.44)	<1

[a] Standard deviations are in parentheses. For the pilot enrichment group, $n = 7–8$; for main enrichment, $n = 30–32$; for de-skilled specialist, $n = 7–8$. Ranges are shown as data are missing on some scales.

[b] For all F-tests, $df = 2, 31$ or $2, 32$.

* $p < .05$, one-tailed test

** $p < .01$, one-tailed test

*** $p < .001$, one-tailed test

enrichment group, although they had significantly higher scores on strategic orientation scores than the main enrichment group ($p < .05$) at time 1, as predicted by Hypothesis 2b, there was no further significant increase in strategic orientation scores.

The next set of hypotheses concerns change in role orientation. As expected, there was no increase in role orientation scores for either the pilot enrichment group or the de-skilled specialist group. In contrast, examination of the means for the main enrichment group shows a significant increase for both production ownership ($p < .001$) and the importance of production knowledge ($p < .001$). The pattern of no change for the groups in which there was no change in autonomy and an increase in role orientation scores for the group whose jobs were enriched during the study period is entirely consistent with Hypothesis 3a.

Hypothesis 3b concerns comparison of the time 1 role orientation scores of the pilot enrichment group and the main enrichment group. Once again the data supported our expectations: the pilot enrichment group, which was functioning as an autonomous group at this time, showed significantly higher scores on both production ownership ($p < .001$) and the importance of production knowledge ($p < .01$).

Discussion

The research hypotheses of key interest in this study, those concerning change in role orientation, were supported. For the group whose job autonomy was enhanced with the introduction of product cells, employees reported increased ownership for a range of problems and recognized a wider range of knowledge and skills as important in performing their roles. These results are consistent with management perceptions and with employee comments in interviews. For example, the production supervisor described how the introduction of product cells "created a strong sense of ownership of the products assembled by the team" (Lodhia, 1992: 91). In interviews, operators made comments about goals and problems at time 2 to a much greater degree than at time 1. For example, when asked how the company was performing at a time after the introduction of product cells, one operator stated: "We have to do our best to stay on top—make sure the boards and the stuff we ship out are the right boards and the right quality that the customer wants. So we stay on top, and we don't need to get behind again." Similarly, after the job enrichment, operators made comments such as: "We are working towards a customer order and know exactly where the jobs are going and when they've got to go for" and "My actual goal is customer satisfaction, I'll do anything to make sure the job goes out on the day it's meant to." A broad role orientation was also reflected in another operator's account of her innovative suggestion to management that operators could be involved in explaining production processes to visiting customers.

Inspection of mean scores for the pilot enrichment group shows that the role orientation scores for this group are consistently higher than scores for the main enrichment group, even after job redesign in both groups. More-

over, the high scores are maintained over a long period, suggesting this difference does not simply reflect a temporary Hawthorne effect (such as feeling positive by virtue of being a member of a special group). Instead, the results suggest a greater degree of change in role orientation for the employees in the pilot enrichment group. This increase might be partly a result of membership in a pilot group that received extensive training and support in the early days of implementation, and it is possible that these aspects alone led to the development of employees' broader role orientations. However, perhaps even more critical were the specific tasks carried out by employees within the pilot enrichment group. Making the product involved both assembly and staging aspects of production, which meant not only that the tasks were of much wider scope than those the other groups performed, but also that the group was buffered from others and was therefore able to function more autonomously. In support of the latter explanation, the levels of reported autonomy at time 2 were higher for the pilot enrichment group than for the main enrichment group.

Consistent with the finding that there was no change in job autonomy, there was no significant increase in production ownership or the importance of production knowledge for the pilot enrichment group or for the de-skilled specialist group. Indeed, for the latter, there was a tendency for scores to decrease. This pattern is consistent with comments from some test engineers suggesting a narrowing of perspective. One person commented as follows: "I have a very narrow view of company products," and another stated this: "With product lines [cells] my focus on different types of boards has gone and I only know about how to fix 3 types of boards, whereas I once could have a chance of fixing about a 100 types."

The hypotheses concerning strategic orientation were partly supported. As predicted, scores increased for both groups exposed to product cells over the measurement period, suggesting that general factors that these groups were exposed to, such as supervisory communication and training courses, facilitated better understanding of strategic principles. Consistent with this, at the start of the study the pilot enrichment group members who were already working in product cells had significantly higher strategic orientation scores than employees in the main enrichment group. However, contrary to what was expected, there were no further increases in scores for the pilot group. One explanation concerns the special nature and timing of the changes for this group. As participants in the pilot group, members had undergone extensive training and coaching prior to the sitewide changes and the start of the study. For example, two managers and one engineer worked extensively with the group in its start-up days. Perhaps further sitewide communication after this time did not substantially add to employees' knowledge base and thus did not enhance their understanding and endorsement of core strategic principles.

One issue that we have not yet addressed is statistical power. This is a particular concern for those analyses where no effects were predicted, as the statistical tests may have had insufficient power to find an effect (so there is

an increased likelihood of type II error). This issue applies to study 2 as well as to study 3; thus, we turn now to some additional analyses that involved samples from both studies.

ADDITIONAL ANALYSES

Although reduced power is a particular concern, the differences in means where no effects were predicted are sufficiently small to suggest that more power would not have altered the conclusions. In studies 2 and 3, the change in mean scores for those instances in which there was no significant increase ranged from −.22 to .23. In contrast, for the main enrichment group in study 3, for which there was a significant increase, the mean scores for the importance of production knowledge and production ownership increased by .74 and .43, respectively.

Nevertheless, we felt it was important to conduct some extra analyses to further address the issue of power. We thus combined samples from study 2 and study 3 and formed two groups. Group 1 was the main enrichment group from study 3 ($n = 32$); group 2 contained all the remaining employees from studies 2 and 3 whose jobs were not enriched with greater autonomy over the study period ($n = 51$). We predicted an increase in strategic orientation for both groups and an increase in role orientation for group 1 only. Thus, for group 2 we expected no change in role orientation, and we examined this prediction utilizing a larger sample.

As before, we conducted a repeated-measures analysis of variance for each of the work orientation scales (''partialing out'' organizational effects using dummy coding) and assessed simple effects of change over time for each group. By way of a manipulation check, we noted that there was a significant increase in autonomy for group 1 (the main enrichment group) but not for group 2. As we expected, we found a significant increase in role orientation scores for group 1 but not for group 2 and found a significant increase in strategic orientation scores for both groups (see Table 7). Thus, the finding of no change in role orientation scores was obtained with a larger sample size and a more powerful statistical test.

GENERAL DISCUSSION

This article addresses the neglected issue of employee work orientations. In an initial study, we described the development of measures to assess two types of work orientation, strategic and role, and demonstrated that the measures were adequate for the purposes of this study. We then presented two field studies that examined the effects of introducing new manufacturing initiatives on employees' work orientations. In the first, a JIT-TQM strategy was accompanied by efforts to inform employees through communication and training, but there was no attempt to enhance employee autonomy. As expected, strategic orientation increased over time, but role orientation did not broaden. In the next study, where an initiative was introduced in conjunction with a deliberate attempt to enhance autonomy,

TABLE 7
Means and Simple Effect Tests of Work Orientations, Groups 1 and 2[a]

Variable	Group 1[b]			Group 2[c]		
	Time 1	Time 2	F[d]	Time 1	Time 2	F[d]
Strategic orientation	3.14	3.42	13.80***	3.26	3.53	19.19***
	(.47)	(.59)		(.61)	(.59)	
Role orientation: Production ownership	2.67	3.41	20.56***	3.31	3.45	1.33
	(.81)	(.93)		(.92)	(.94)	
Role orientation: Importance of production knowledge	3.27	3.70	21.04***	3.81	3.65	5.37**
	(.69)	(.57)		(.55)	(.54)	

[a] Standard deviations are shown in parentheses.

[b] The main enrichment group from study 3.

[c] Includes the later change group and early change group from study 2 and the pilot enrichment and de-skilled specialist groups from study 3.

[d] For all *F-tests, df = 1, 80 or 1, 81.*

* $p < .05$, one-tailed test

** $p < .01$, one-tailed test

*** $p < .001$, one-tailed test

those employees who reported greater control also developed more flexible role orientations. Taken together, results from these studies support the proposition that change in strategic and role orientation is facilitated in different ways.

A potential practical implication of this finding is that organizations need to adopt two levels of interventions when introducing new manufacturing practices. To facilitate the development of a more appropriate strategic orientation, initiatives that enhance understanding of modern principles are needed. These can be formal programs (such as training or communication schemes) but can also include efforts to change systems that reinforce traditional manufacturing principles—removing individual productivity bonus schemes that send a strong message to employees that quantity is more important than quality is an example. However, to facilitate a broader role orientation in which employees have a more strategic and proactive outlook, restructuring jobs and authority structures is likely to be necessary. As Aktouf stated, a change in power structure is needed to develop proactive, broad-thinking employees "because such a change must be a lived experience and it can be neither contrived nor commanded" (1992: 419). This recommendation for "empowerment" is one that is frequently espoused but is not often achieved in practice. It seems that organizations either ignore work organization issues when introducing new practices (Storey, 1994) or try to bring about the required attitude change by adopting coercive human resource management strategies (Delbridge et al., 1992).

The association between autonomy and role orientation is also important from a research perspective. Specifically, it is consistent with the premise that work redesign can promote employee learning and development.

One possible mechanism is that autonomy allows hands-on learning in which people have the opportunity to interact with the environment and become more involved in, and more knowledgeable about, the wider production process. This experience might then lead to broader ownership of problems and a more proactive view of performance. Indeed, the resulting movement toward a flexible role orientation can be seen in terms of Argyris's (1957, 1964) developmental criteria. Argyris characterized the "child" as passive, reactive, dependent, and seeking immediate need gratification and the "adult" as proactive, independent, and able to tolerate delayed gratification. An employee who feels ownership for a range of strategic problems can be seen as closer to the adult end of Argyris's spectrum than someone who feels concern for only a limited range of problems with immediate consequences. The following quote from one of the operators whose autonomy was enhanced (study 3) supports this developmental explanation:

> I've matured quite a lot, definitely have, because before . . . you work in this environment with a supervisor telling you what to do and you've got this thing inside you that "OK, they are like parents, I am a kid" and you tend to work like that. . . . With this team-work, people treat you like an adult which is a really good thing. And if they are going on to product cells in the whole factory, and if they treat more and more people like adults, I think, you know, a lot of people will grow up.

The idea that autonomy facilitates learning and development is an important extension of existing job design research, which has traditionally focused on how work redesign impacts affective reaction variables, such as job satisfaction and well-being. It also highlights an alternative mechanism for enhanced performance. Better performance resulting from job redesign is usually explained in terms of motivational processes (i.e., motivated workers work harder and take more care). Or, if explained in nonmotivational terms, the better performance is viewed as a result of more efficient work systems that allow quicker responses to problems. A learning process is an alternative explanation (cf. Frese & Zapf, 1994; Wall, Jackson, & Davids, 1992). As a result of active and autonomous engagement in more tasks, people develop new understandings of their roles and how they should be performed. In Porter and Lawler's (1968) terms, employees develop a more appropriate role perception that then guides the direction in which they expend their effort. Clearly, a critical link in such a proposition is that between work orientation and performance. Such a link has been assumed to date, but not tested. We discuss the need for such tests as part of a broad research agenda suggested by this article.

A key limitation of our studies is the small samples used, which give rise to problems concerning power and generalizability. An extra analysis demonstrated that lack of power was unlikely to explain the absence of change in role orientation. A further argument against power as an explanation for the results is the qualitative data that supported the statistical con-

clusions. The issue of generalizability, however, remains a concern. Our strategy was to find and compare organizational initiatives that were very similar in their JIT-TQM emphasis but offered clear contrasts on the enrichment dimension. Thus, our preference was for focused research designs, which possess strong internal validity relative to the propositions, rather than for larger-scale and less focused designs. Despite our approach, it is clear that further studies are needed, and we hope our article will promote research in this area. Such studies could be extended to nonmanufacturing contexts (for example, TQM and the associated customer ethos is increasingly prevalent within service industries) and to employees in higher-level positions (for example, one could examine supervisors' changes in role orientation as they move from a controlling role to one emphasizing coaching and boundary management).

A further limitation of the studies concerns the measurement of work orientation. The measures developed here were appropriate for the purposes of testing the research propositions, but there is clearly room for further development of the scales, and our results suggest it would be worthwhile to invest effort in doing so. Issues that are likely to emerge concern the degree to which generalized measures that transcend contexts can (or should) be developed, the independence of the measures, and the dimensions within the measures. Studies with larger samples that permit factor analysis are needed to establish the latter aspects. The differential validity of the scales in relation to similar concepts, such as organizational citizenship (Bateman & Organ, 1983) and proactive personality (Bateman & Grant, 1993), should also be investigated. Moreover, although the work orientation measures developed here serve their intended purpose of evaluating broad-based changes, fine-grained changes in orientation will probably require qualitative methodologies.

A further research priority, as described above, is to examine the relationship between performance and work orientation. To date, it has been assumed that employees require a certain type of work orientation in order to perform effectively within modern manufacturing contexts. We also obtained promising results in exploratory tests of the relationship between orientations and supervisory ratings of performance within the case studies described here. However, given the complexity involved in predicting performance, these analyses are not reported here. Studies should be specifically designed to look at this issue, and close attention should be given to how performance is assessed (objectively or subjectively, individually or collectively) and to the dimensions of performance that are measured (multiple aspects might be appropriate, such as role innovation and flexibility). For meaningful tests of an association between work orientation and performance, it will also be important to consider contingencies that might affect the relationship. Barrick and Mount (1991) argued that a link between personality and performance can only be established under "weak" conditions in which behavior is not constrained, such as in jobs with high autonomy. Applying this reasoning here, work orientation might relate to performance

only when employees have sufficient autonomy to behave in a way that is consistent with their orientation.

The type of production environment will be a further contingency to consider. In environments in which the technology is simple and the environment is stable, organizations might be able to achieve sufficient gains from new initiatives without enhancing autonomy or developing employees (Clegg, 1984; Lawler, 1992; Slocum & Sims, 1980). A case in point concerns the organization described in study 2, which, in spite of maintaining a traditional work design, obtained benefits of the JIT-TQM initiative in terms of lead time, work-in-progress, space, and housekeeping. This was a relatively stable environment in which the driving force for change was reducing cost. In contrast, where the production environment is highly uncertain (e.g., where there are frequent changes in product design and turbulent markets), perhaps only an autonomous and flexible workforce with broad role orientations can cope with the changing demands. The company described in study 3 is illustrative. Management required greater flexibility and higher quality and saw both outcomes as dependent on developing a flexible, thinking, and highly committed workforce. As Jones and Scott (1987: 35) suggested, to attain such "intangible and qualitative" benefits, changes to work roles and authority structures are essential.

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APPENDIX

The following items and stems, given verbatim, composed the scales used in study 1.

Strategic Orientation

This is a list of statements made by people about work in general. We would like to know *your* opinion on these issues. Please rate whether you agree or disagree.

1. In the long run, production is more efficient if people stick to what they already know,

rather than learning new things.
2. Efficient workers get on with what they've been told rather than questioning things.
3. Fixing problems as they arise is more efficient than trying to prevent them.
4. When an organization is running smoothly, there's no need to think about changing things.
5. It is important to keep making products, even if they go into stock rather than directly to customers.
6. In a production department, time spent not producing is time wasted.
7. The most important goal of a production department is to keep producing no matter what.
8. When I see lots of work on the shopfloor waiting to be finished, I feel confident of this company's future.
9. If I know what to do and how to do it, I am not concerned about why.
10. It is not my job to make important decisions about my work.

The response scale was 1, strongly disagree; 2, disagree; 3, not sure; 4, agree; 5, strongly agree. All items were reverse-coded.

Role Orientation: Production Ownership[a]

To what extent would the following problems be of personal concern to you (note that some of these problems may be someone else's concern, such as your supervisor's, or they may not be a problem):

1. Orders for the products you deal with were repeatedly not being met on time.
2. Customers for the products you deal with were dissatisfied with what they receive.
3. The quality of the products made in your work area was not as good as it could be.
4. There was much unfinished work sitting in your area.
5. There was a pile of completed work in your area.
6. The way some things were done in your work area meant a lot of re-work was needed.
7. Others in your work area were not pulling their weight.
8. People in your work area were not coordinating their efforts.
9. There was a lack of well-trained people in your work area.

The response scale ranged from 1, to no extent, of no concern to me, to 5, to a very large extent, most certainly of concern to me.

Role Orientation: The Importance of Production Knowledge[b]

How important are the following skills and knowledge for you to do your job effectively?

1. Knowing the root causes of production problems that occur.
2. Being able to measure and analyse problems in the production process.
3. Being able to anticipate and prevent production problems.
4. Being able to make decisions as part of a group.
5. Being able to involve and motivate people.
6. Being able to understand other people's points of view.
7. Understanding how work flows in your work area.
8. Knowing what skills everyone in your work area has.
9. Knowing the priorities of work in your area.
10. Knowing the requirements of your end customer.
11. Knowing the overall objectives of the company.
12. Knowing what is different about the products made in this company compared to those made by competitors.

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[a] Items tapping problems concerning the categories goal achievement, operational inefficiencies, and group cohesion and coordination are items 1–3, 4–6, and 7–9, respectively.

[b] Items tapping cognitive activities, team working, knowing local production requirements, understanding of wider manufacturing, and self-direction are 1–3, 4–6, 7–9, 10–12, and 13–15, respectively.

13. Being willing to challenge and question the way things are done.
14. Being willing to take on and accept new responsibilities.
15. Being able to work out what to do when instructions are vague.

The response scale ranged from 1, not at all important, to 5, extremely important.

Study Variations

Study 2. Role orientation—production ownership: As above, except item 6 was "In your assembly area, products were being handled unnecessarily." Role orientation—the importance of production knowledge: As above, except item 12 was "Being able to get on with a job without raising objections, even if the way it's done is not the best" (reverse-coded).

Study 3. Strategic orientation: Items 6, 7, and 8 were replaced by "I could do my job perfectly well without knowing the company's overall objectives," "I find it reassuring if there is always a large pile of work waiting for me to work on," and "I can't be expected to be concerned about mistakes other people make." Role orientation—production ownership: As above, except item 3 was "In your assembly area, products were being handled unnecessarily." Item 8 was replaced by two different group-cohesion items appropriate to the context. "There are strained relations among some members of your work group" and "Too many people in your area want to go on holidays at the same time." Role orientation—the importance of production knowledge: Item 4 was "Knowing how to assess the performance of the work group." Instead of items 10–12, the following items assessed self-direction: "Knowing how to allocate tasks without the supervisor," "Knowing how to put over an idea," and "Knowing how to go about resolving problems." Finally, replacing item 15 was "Understanding the costing in your work area."

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