Resistance to Teamworking in a UK Research and Development Laboratory

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Abstract

This article presents an ethnographic exploration of resistance to teamworking in a UK research and development laboratory named RDL. It focuses on the nature of autonomy and responsibility and the implications for resistance. It finds that resistance is shaped by the laboratory technicians' individualistic interactions with technology, the laboratory layout and the technicians' desire for personal task-related autonomy and individual responsibility rather than team-based accountability. However, although resistance is linked to an individualistic interpretation of work it is supported by collective collusion. The article also finds that resistance is not necessarily anti-work. It is simultaneously oriented towards the interests of the company and individual technicians through the technicians' desire to perform their job well. Finally, the article demonstrates the local and constructed nature of resistance.

Keywords: Individual Autonomy, Collective Collusion, Resistance to Teamworking, Flexibility, Responsibility, Technicians, Technology.

Introduction

Approaches to workplace resistance are typically concerned with the relationship between managerial control and workers' everyday struggles for autonomy (Burawoy, 1979; Collinson, 1994; Hodson, 1995; Nichols and Beynon, 1977) and with resistance to the disciplinary mechanisms inherent in initiatives such as teamworking (Sewell and Wilkinson, 1992). This article explores resistance to teamworking by technicians employed in a UK research and development laboratory (RDL) which is owned by a chemicals company named 'Plastico.' In the early 2000's RDL became a semi-independent, self-financing unit selling its

expertise and developing bespoke products for external customers. Teamworking was intended to support this strategy.

The article's objectives are to (1) identify the form of teamworking envisaged by Plastico managers, (2) explore the technicians' interpretations of teamworking and (3) explain the relationship between the RDL labour process and the technicians' resistance.

The article begins with a discussion of teamworking and resistance followed by an overview of the organisational context, methodology and methods. Next is an ethnographic description of the organisation of work and proposed teamworking and the technicians' interpretations of work. The article concludes with a further discussion of teamworking and resistance at RDL.

The article finds that teamworking in RDL involved a shift from individual to collective responsibility and greater functional flexibility. Teamworking was viewed as a threat to personal autonomy and accountability and its potential for work intensification was recognised. Resistance was linked to the labour process through the technicians' individualistic relations with technology, the laboratory layout and their desire for individual autonomy and responsibility. However, resistance was also supported by a degree of collective collusion.

Teamworking

Teamworking involves collective participation in a task or process (Nijholt and Benders, 2010). Distinctions are drawn between high and low-road teams. The former are characterised by self-regulation, commitment and autonomy while the latter contains limited autonomy, direct control and low-skill (Bacon and Blyton, 2000; Proctor and Mueller, 2000). Similarly, Gallie et al. (2012) distinguish between self-directed teams which exert

influence over effort, choice, task execution and quality standards and semi-autonomous teams that have some control over work activities but are not self-managing.

Previous research has also explored whether teamworking facilitates autonomy (Delbridge et al., 2000a) and its potential for surveillance and control (Barker, 1993). Team autonomy involves routine operational decisions and more fundamental decisions over allocation, scheduling and quality of work and improvement of work processes (Nijholt and Benders, 2010). Research suggests that fundamental forms of autonomy are limited. In a study of low-road teams in the auto-components industry Delbridge et al. (2000b) suggested limited responsibility for the pace and allocation of work and product quality, but considerable responsibility for routine production tasks. They also found that team leaders exerted high levels of managerial control (Delbridge et al., 2000b).

Even among highly skilled technicians, research suggests that teamworking affords limited autonomy. In a study of technicians in the IT industry, Darr (2000) described how customer service teams had no discretion over task allocation, pace of work or team composition. Projects were assigned by the customer engineering manager, although teams did have the autonomy needed to deal with operational problems.

A more nuanced account is advanced by Findlay et al. (2000). Participants in their study of teamworking reported increased job satisfaction, creativity and responsibility alongside work intensification and task simplification. Similarly, Gallie et al. (2012) found that self-directing teams possessed high levels of task discretion and displayed higher levels of organisational commitment. Semi-autonomous team members in contrast, had no more task discretion than non-teamworkers.

Autonomy can be individual or collective. Individual autonomy is argued to allow workers greater personal control over their work. Collective autonomy is distributed throughout the

team but can be hijacked by particular individuals (Sprigg et al., 2000). Teamworking assumes the replacement of supervisors with team leaders (Proctor and Mueller, 2000) who often retain supervisors' hierarchical position and withhold autonomy from the wider team (Gorgeu and Mathieu, 2005). LaNuez and Jermier (1994) argue that resistance is often linked to a loss of individual autonomy because workers are likely to pursue personal control. Further critical accounts of teamworking link it to peer pressure control whereby teams are made collectively responsible for production and product quality (Barker, 1993; Harley, 1998).

A key concept in the teamworking literature is functional flexibility which involves team members performing a wider range of tasks. Horizontal flexibility integrates rigidly defined tasks whilst vertical flexibility integrates tasks containing different degrees of skill (Atkinson and Meager, 1986). Functionalist accounts of teamworking have been criticised because they imply collaboration, vertical flexibility and complexity, most of which are limited in reality (Findlay et al., 2000; Kalleberg, 2001; Pollert, 1991). Functional flexibility is also argued to facilitate work intensification, role confusion and a more compliant workforce (Desombre et al., 2006; Findlay et al., 2000).

Debates around teamworking also characterised a recent study of creative project teams in the gaming industry. Hodgson and Briand (2013) explored whether the project management system enables meaningful autonomy. They questioned whether creative project teams involve empowered, flexible, knowledge-based production methods and a shift beyond hierarchical control. Hodgson and Briand (2013) investigated a project management system purporting to be collegiate, democratic and participative rather than hierarchical and controlling. They concluded that the organisation's claim to a flat democratic structure and culture was unfounded. Power relations within the project team remained because the

team leaders directed processes and steered discussions. Team autonomy was limited by management deadlines and targets.

Hodgson and Briand (2013) also described evidence of resistance. The programmers accepted the regime, but the animators and artists resisted by providing insufficient information in team meetings. This undermined the managers' ability to grasp the project's progress. The animators and artists also valued the individual ownership of their work. Their autonomy was nevertheless circumscribed because the work was orientated by the vision of the art director. Hodgson and Briand (2013) argue that although the project team members had some collective choice over tasks and work methods, decisions over work effort, targets, resource allocation and team selection were imposed.

This research bears similarities to Hodgson and Briand's (2013) study. The RDL technicians were knowledge workers who were asked to work collaboratively and were engaged in creating original products. Similar issues of hierarchy, control and autonomy characterised their labour. The technicians also shared the animators' and artists' values around the individual ownership of work. These issues are further explored following a review of the resistance literature.

Resistance

Resistance can be formal or informal and collective or individual (Mumby, 2005). Hodson (1995) distinguishes between passive resistance such as withholding information and avoiding work and active strategies such as machine and social sabotage. Social sabotage involves the undermining of supervisors' authority through open criticism and a cynical orientation to work (Collinson and Ackroyd, 2006).

Examples of collective informal resistance include Nichols and Beynon's (1977) chemical plant operatives using informal job-rotation to carve out rest periods. This resistance was

orientated to improving employment conditions. It was anti-work and outside union-management negotiations. Employees have also used informal resistance to exert their superior knowledge by following management instructions despite knowing that chaos would ensue (Thompson, 1983).

Knowledge is a crucial resource for resistance. It can be bureaucratic or technical and production focused. Resistance relates to how knowledge is deployed in particular organisational conditions (Collinson, 1994). Knowledge-based resistance includes restricting information to managers and ignoring organisational campaigns (Collinson, 1994). Thus, Hodgson and Briand's (2013) animators' and artists' refusal to provide information resulted in managers having incomplete knowledge of the status of projects. Ultimately however, although the animators and artists were successful in evading the control technologies inherent in project management, their managers successfully imposed alternative personalised hierarchical control through the art director.

With respect to collective and individual resistance, it can be argued that a more nuanced distinction is needed. What appear to be individual acts of resistance, such as work avoidance, withholding information and cynicism, may be rooted in collective complicity (Mulholland, 2004). In her study of call centre workers, Mulholland (2004) argued that seemingly individual resistance is rooted in collectivism. She argued that the collective analytical framework supports an exploration of how work groups evolve into defensive alliances. It also aids understanding of how workers collude and collaborate. Mulholland (2004) suggested that the collective framework is necessary because the labour process requires collaboration. She further argued that the emergence of informal resistance at the call centre was linked to the weakness of the trade union.

Examples of resistance included the call centre operatives talking to answer-phones and faking sales rather than calling a new customer. This is collective because the operatives collectively denied all knowledge of the practice (Mulholland, 2004). Collective collusion also involved informal smoking breaks which provided an opportunity for grievance sharing and the development of solidarity. According to Mulholland (2004), these were not isolated incidences of defiance but were part of a wider pattern of work rejection.

In summary, resistance involves struggles to carve out autonomy and freedom within the labour process, whether this is through misbehaviour, sabotage or the exercise of knowledge. The extent to which these forms of resistance were found in RDL is now explored through ethnographic observation and description. This begins with an outline of RDL and the methodology used in the exploration.

Organisational Context and Methodology

Plastico was located in Northern England. It employed 300 people and it produced chemicals used to manufacture plastics, adhesives and cleaning products. 80% of production employees belong to the trade union. RDL was the company laboratory and until semi-independence its services were exclusive to Plastico. Following semi-independence it was forced to sell laboratory services to external customers and return a profit. It also sold its expertise to Plastico.

RDL employed 10 technicians, a Senior Technician (ST) and a Laboratory Manager (LM). All possessed a BSc Chemistry and all but two technicians were male. The LM was responsible for day-to-day activities while a senior Plastico production manager (PPM) had strategic responsibility. The Plastico Human Resource Director (HRD) was responsible for HR in RDL. The laboratory was located on the second floor of a two-storey building. Six workstations were set out in a 'U' shape around and facing the external walls of the first bay. Four further

outward facing workstations were situated in an adjoining bay. To alter this arrangement would require a refit of the laboratory. Each technician was assigned their own equipment for which they took complete responsibility. The LM and ST shared an office and there was a separate staff room.

The research was inductive, qualitative and ethnographic and involved immersion into the daily life of RDL. It employed non-participant observation, interviews and documentary evidence. The fieldwork involved two six-hour visits per week for six-months. Non-participant observation included observing the daily activities of staff and participation in conversations. Observation notes were made throughout. Notes included descriptions of events, actions and conversations and also theoretical notes, feelings and hunches (Emerson et al., 1995).

Unstructured and semi-structured interviews were conducted with groups and individuals. They took place in the staff room during the coffee and lunch breaks or in the laboratory as technicians carried out their work. The interviews were recorded and their purpose was to elicit the interviewees' understandings of the research topic (King, 2004) in order to explore the local and constructed nature of resistance.

Unstructured informal conversations were ongoing throughout each day of the fieldwork and were embedded in daily interaction with participants. The excerpts given were chosen because they emphasised teamworking, resistance and the labour process but other topics such as the economic viability of the company and previous work experience were discussed.

The formal interviews focused on the labour process, teamworking and resistance. One formal interview with each technician, the ST, the LM, the PPM, the HRD and the trade union convener was conducted. Formal interviews with the technicians lasted for between

one and two hours. The interviews with the LM and ST were one-hour fifteen minutes and one-hour thirty minutes respectively. The interviews with the PPM, HRD and union official were also of one hour-thirty minutes duration. Documentary evidence was interpreted in terms of what is said, who said it and why it was produced. The technicians' job descriptions were, for example, jointly developed by the PPM and the HRD to promote teamworking. Newsletters were produced by senior managers.

Analysis of the field notes and interviews involved dividing data into interpretive elements; examining it for relationships and connections with the literature and hunches derived from the fieldwork (Jorgensen, 1989). The interpretation process used indigenous typologies and analyst-constructed typologies (Marshall and Rossman, 2011). Indigenous typologies are based on the interviewees' meanings and use of language, for example, their descriptions of the organisation and nature of work, the nature of responsibility, the technology and teamworking. Analyst-constructed typologies are based on the researcher's theory-laden interpretations, for example, the various typologies of teamworking, autonomy and resistance and notions of individualism. The search for patterns highlighted the relationship between the technicians' interaction with machinery and their individualistic orientations, the relations between senior managers, laboratory managers and the technicians and the relationship between forms of autonomy and resistance. Data was then reassembled to develop explanations followed by an evaluation of the explanation. Access to RDL was achieved through a manager who did not participate in this research.

Teamworking at Plastico and RDL

Teamworking was established on the plant in the early 2000s through formal agreement with the then Transport and General Workers Union (now Unite). According to the Unite official:

> The union recognised that the company was under threat from cheaper producers abroad and we had to accept some changes. Teamwork brought staffing cuts and the men work harder. We don't like it but we had no choice and reluctantly agreed to it.

Each plant team had a team leader and a production manager was responsible for 10 teams. Team members were expected to engage in job-rotation. This requirement was enshrined in the production operatives' job descriptions, which were written to support the teamwork agreement. For example:

- Operatives are expected to perform a variety of production tasks as and when required.
- Production operatives are required to adopt a flexible approach to their work.

Teamwork on the plant exemplified the low-road semi-autonomous teams described by Delbridge et al. (2000b) and Gallie et al. (2012) and involved routine decisions over task allocation within the team. Before the introduction of teamworking such decisions were taken by the supervisor. However, because supervisors were recast as team leaders the former hierarchy remained intact.

The attempt to introduce teamworking to RDL was linked to a perceived need by senior managers for changes in the organisation of work to support semi-independence. It involved changes to the technicians' job descriptions and a campaign to persuade them of the need for teamworking. Before semi-independence the technicians' role was to perform daily safety and quality checks on chemicals used in production. Their formal job description was to:

- Prepare samples.

- Carry out routine analytical tasks; record and interpret test results; perform mathematical calculations using IT; prepare and present data.
- Maintain laboratory equipment.
- Conduct safety checks and follow safety procedures.

The Technicians' work was distributed and performed on an individual basis. During an informal conversation at the start of the fieldwork, the LM provided some background information on the traditional organisation of work:

> Each technician was given a worksheet that the ST or me had put together. We decided who did what following discussion with each technician around personal preferences and expertise. There was never much discussion. They all had certain jobs that they enjoyed, were good at and which were their jobs. They just got on with it without interference from me or the ST. When they had finished they would report their results to one of us and we would collate them.

Following semi-independence routine checks for Plastico remained important but were augmented by contracts to perform similar services for other companies. Moreover, contracts to design, create and develop products for external customers became an increasing portion of RDL's work. According to edited extracts from the laboratory website:

> RDL provides expertise and support to a variety of industries. Its services range from specific problem solving, quantification and testing using chemical and material analysis to innovative research and development projects to support customers transform their ideas into new products. Our staff are highly experienced and skilled in a range of laboratory techniques. Projects are delivered in a timely and cost effective way.

The revised technician job description document described the design and development role and the need for collaboration in pursuit of product development. The technicians were now expected to:

- Update their knowledge of technical developments.
- Conduct research on relevant topics in collaboration with team colleagues.
- Work flexibly within a team structure to design and develop products to the specification of individual customers.

The PPM believed that teamworking was essential to successful research and development because it forces individuals to share knowledge for the benefit of the project. In a formal interview he argued that:

> We must get the technicians organised into flexible teams with team leaders like the plant operatives. The technicians should be collaborating rather than doing their own thing. They should share ideas and pool their knowledge to create new products for customers. Each team would be responsible for dealing with testing procedures for specific customers and for taking on development projects for new customers.

Despite the PPM's exhortations there was no evidence of any change at RDL. The LM described the distribution of work following the shift to semi-independence and the internal and external market:

> We (the LM and the ST) decide who will work on what project, but we take account of their personal preferences and expertise. We decide what tests need doing and put them on the worksheets. They get on with it and report back to us. If it is a design and development project we will work up the prototype with the technicians.

The LM's description of the distribution and organisation of work was supported by the following observation of the distribution of work.

The day always started with staff arriving between 8:15am and 8:45am. They began by making tea or coffee and some would eat breakfast together. During this time there was much chatter and banter. The talk was usually about non work-related issues, for example holidays and television programmes. They rarely discussed their work.

Just before 9am the technicians would prepare their own work station and calibrate their machines. At this point the LM or ST would distribute the work following discussions with individuals regarding their preferences. The technicians then performed their work without interference from the two managers and reported back their results. An example during the fieldwork was the development of a product to prevent discolouration in paints. It involved three technicians individually testing various chemical recipes to find the optimum mix. Results were reported back in a meeting between the ST and the three technicians. Production of the final prototype was managed by the ST.

A description of this routine on one specific day is as follows. Three technicians were working on the above project. Their day involved working through pre-existing planned experiments and engaging in a one-hour long afternoon meeting with the ST to discuss the results to date. They began their tasks at 9am and worked independently of one another and the two managers. There was no discussion of the tasks prior to the afternoon meeting. Two further technicians were working on ongoing routine tests for Plastico. These involved checks on the ingredients used in the manufacture of a cleaning fluid. Again they performed their work independently. The remaining five technicians were called into the office of the LM to be given new tasks. One was to identify and eliminate a contaminant in a new adhesive product for an external customer. This required three technicians including the ST.

The three remaining jobs were routine quality testing procedures for Plastico products. The Manager asked who would like to work on the external project. T10 said that she would rather not because she had always been responsible for the routine testing of the quality of the raw materials for a detergent and her preference was to retain that responsibility. T3 and T8 volunteered for the project. T1 and T2 said that they did not mind picking up the remaining routine testing.

The three technicians allocated the routine testing were given worksheets and begin their tasks independently. The two technicians working on the project were also given worksheets containing experiments already devised by the ST. A plan was made for all three to meet the following day to compare their initial results.

Following the distribution of tasks the technicians performed their work quietly and independently. There was very little interaction or conversation between individuals until the tea breaks. During breaks the staff room again became lively with chatter, joking and banter which included the LM and ST. This pattern of work and social interaction was repeated throughout the fieldwork.

This observation along with the LM's descriptions of work allocation before and after the attempt to introduce teamworking suggests that little had changed following the move to semi-independence. Before semi-independence the laboratory managers would specify which technician would perform particular tests, although the technicians were consulted about their preferences and given some choice. The technicians performed the tests using individual autonomy and personal discretion. This system remained in place despite the new job description stating that the technicians should work flexibly within a team structure. Other than the technicians working with managers to develop the prototype, work was still

organised around individuals. From the perspective of senior managers this could obstruct production:

> According to the PPM the problem with the way they work at the moment is that they are all good at what they do but they stick to what they like. Also, if one of them is off sick or on holiday their work gets left until they return. And no one is responsible because everyone has their own worksheets. That includes the LM and ST because they have their own tasks (HRD).

The HRD's comment suggested that he and the PPM believed that the traditional individualised way of working was problematic because staff were not taking responsibility for covering the work of absent colleagues. There was also no clear line of responsibility for ensuring that work was completed on time. Although this system was problematic before the shift to semi-independence, it became, from their perspective, more problematic in the market-led operation in which meeting customer expectations was crucial to securing further contracts.

The extent to which the fears of the PPM and HRD were justified is however, questionable. When asked by the author to give examples of the laboratory staff failing to deliver a project on time, or of work being left due to staff absence or holidays, neither could remember such an event occurring.

The form of teamworking envisaged by the PPM and HRD was similar in structure to that on the plant:

> We will have two teams of four and one of three. The LM will distribute projects to teams. Team members will decide between them who does what depending on their personal preference and expertise. Team leaders will be responsible for making sure that everything runs smoothly (PPM).

The PPM and HRD had developed a four-stage implementation strategy. This involved:

1. Formal agreement with the trade union.
2. Altering the technicians' behaviour through a campaign of persuasion.
3. The introduction of formal teamwork structures.
4. Review and evaluation of teamworking.

Trade union agreement was secured a year before the fieldwork and the Unite official was mildly sympathetic to the management position:

> I cannot see how we can say no when the plant operatives have been doing it for ages. But it's not easy to persuade the laboratory technicians because they have expertise that the plant men don't have. We have agreed to it though.

During the fieldwork the strategy was stuck at stage two. The campaign of persuasion took various forms including the Plastico newsletters which were distributed to all employees. Each copy contained 'teamwork' stories. During the fieldwork one story described a production team organising 'skill sharing' sessions. A second described how a team devised a system for logging and sharing information. The PPM also gave periodic briefings to RDL staff. The following description is taken from field notes.

The Briefing

The briefing lasted for one-hour and took place in the staff room. The PPM described the success of teamworking on the plant such as fewer production hold-ups caused by absence and increased job satisfaction for operatives. He followed this by outlining the expected benefits of teamworking for the laboratory. These were a quicker turnaround of projects due to reductions in bureaucracy; fewer delays caused by the absence of individuals performing key tasks; collaboration and knowledge sharing and increased job satisfaction. The briefing ended with a question and answer session.

During the briefing the technicians listened quietly and politely and made no comment. Questions were asked at the end. First was a question about how they would record who performed each task if the task became the responsibility of the team. This was followed by the comment that if all tasks were recorded by group members there would be an increase in paperwork and therefore a rise rather than a reduction in bureaucracy. Furthermore, should they do it before they began or following completion of a task because there would be implications if someone else took over? The technicians agreed that some record was needed for reasons of accountability but that this was nearly impossible if they were not individually responsibility for their own work. A second question concerned the apportion of responsibility for a failed project. The third question was would a team be given longer to complete a project if a member was absent because if not the rest of the team would have to work harder. Finally, the PPM was asked to specify how job satisfaction would be increased given that the job was already satisfying.

The PPM responded to the first question by stating that a system for recording work would be developed, although no detail was given. His response to the second question was that the team would take collective responsibility. He answered the third question by saying that it would depend on circumstances. In response to the fourth question, the PPM made vague comments about satisfaction through collaboration.

Following his departure the technicians made jokes and disparaging comments about the briefing. For example:

> Well that shows what that fool knows about working in a laboratory. Why should we waste time recording who does what when you can do it for us? And anyway, how will he develop a recording system unless we tell him how to do it (T6 to ST laughing).

I bet none of the other senior managers will take collective responsibility for his mess-ups (T7).

Well I'm not taking collective responsibility for yours (T3 to T7 laughing).

The discussion continued during the afternoon coffee break. In the following exchange the focus is on the teamwork and flexibility stories found in the newsletter:

I was talking to Frank after they did a piece on his team. He said that they just made the stuff up about flexibility to please their manager (T4).

We have a laugh about these flexibility stories. No one takes them seriously (T5).

One week after this briefing took place I encountered the PPM walking outside the laboratory. I asked him how he felt that the briefing had gone. His response was short, terse and angry. He said that:

The technicians are awkward. They deliberately refuse to use their expertise to support teamworking. It would be easy to develop a system for recording who does what but it would be difficult to enforce without cooperation from the LM. The laboratory staff, including the LM and ST, are deliberately misunderstanding what's required of them.

A number of issues are highlighted by these incidents. First, the comment from T6 to the ST suggested an intention to withhold the bureaucratic knowledge needed to develop a viable recording system. Because the PPM had no experience of laboratory work he had difficulty countering their arguments even though he believed that developing a recording system should be easy. It can also be suggested that the technicians do understand the possible implications of teamworking. Their responses to the second question implied that teamworking would challenge their individual personal responsibility while their responses to the third indicated an understanding of the work intensification potential of

teamworking. Finally, the technicians used ridicule and humour to reject the ideas found in the newsletter stories and to undermine the authority of the PPM.

The HRD recognised that the technicians were highly skilled individuals whose cooperation needed to be harnessed not forced. In a formal interview conducted in his office he suggested that:

> We are dealing with educated people. We can't easily push them into this without their consent so we are trying to do it through persuasion. I tried to organise some outdoor teambuilding training away from the laboratory. It's logistically impossible though because we cannot take them all at the same time and doing it with just a few would not have the same effect.

The PPM was less relaxed however. In a formal interview in his own office he further voiced his anger and frustration with the laboratory managers:

> I have asked the LM and the ST to place individuals in teams but they refuse. I am angry about this and the rest of the senior management team agree with me.

He then threw a pencil down on his desk and broke it and refused to answer the question of how teamworking could be forced on RDL staff given their expertise. The PPM abruptly ended the interview by refusing to continue.

The LM also felt under pressure from the PPM to take a heavy hand with his staff. During a tea-break conversation in which he and I discussed the PPM's attempt to force him to establish teams he said that:

> It's all very well coming up with these ideas for me to implement but I have to work with my staff. You cannot force highly qualified industrial chemists to work in ways that make them uncomfortable.

These statements suggest a degree of conflict between the PPM and the two laboratory managers over teamworking. They also suggest that the laboratory managers are complicit in the technicians' resistance.

Resistance to teamwork structures

Resistance to teamworking by technicians was not limited to non-cooperation with the campaign of persuasion. It occurred despite teamworking seeming to have potential benefits for selected individuals in the form of a small pay rise and limited career progression. Although there was no attempt to alter the reward system to include team-based merit pay, under the teamwork structure the ST would become a team leader and two further team leader posts would be created. The technician salary scale at the time of fieldwork was £18,500 to £25,000 and up to £27,000 for the ST. Team leaders would be placed on the ST grade. The technicians were invited to apply for these posts but none had responded. When asked why they said that the small pay rise was not worth the extra responsibility. T6 also suggested that:

> Applying to be a team leader would imply that we agree with the changes and we don't.

Thus, despite the possible if limited benefits for selected individuals, the technicians remained sceptical of teamworking.

Interpretations of work

The technicians' resistance to teamworking was also connected to their interpretations of work which focused on issues of work organisation, technology, autonomy and learning. They were moreover, individualist in their orientation.

Technology and the spatial organisation of work

The technicians had sole responsibility for operating and maintaining their own equipment. The following comments were made while technicians one and two demonstrated their machines to me:

> You need to get to know your equipment through working with it, touching it. You get a sort of gut feeling for it (T1).
>
> Yes, and experience is important for understanding how to interpret the results from particular machines accurately. It's difficult to explain to a non-chemist but you get to know a particular piece of equipment by touching it, using it, feeling it. Not by reading about how it works or someone telling you (T2).

The technicians also had their own personal work space and a communal space in which to socialise. During a lunch-break conversation in the staff room they described why they like the layout.

> It's quiet and we can get on with our work without distraction from each other or things going on in the room (T4).
>
> The way the laboratory is set out gives us our own space so we don't bother each other (T9).
>
> Is that a good thing? Why? (Author).
>
> That's obvious. We have the space to think about what we are doing, decide what to do next. Because we now have to develop new products we are not simply doing what we have done lots of times before. Obviously we have the knowledge and experience to carry out these experiments accurately, but there are differences so we need to think about what we are doing (T4).

The technicians viewed requests for help as an embarrassing abdication of responsibility. The following quotes were taken from a tea-break conversation in which I asked whether technicians help one another out:

> We just follow our own worksheets and I am responsible for what's on mine (T8).
>
> We are given worksheets and we get on with our own work. No one likes to ask for help if they can avoid it – it would be embarrassing (T7).
>
> Why? (Author).
>
> Well, it would look like we don't know our own job – or that we are trying to get someone else take responsibility for our work (T9).

Their reluctance to ask for help was augmented by a reluctance to share their expertise. The following conversation took place during a shared lunch:

> Do you collaborate with one another and share your expertise when you are conducting experiments on new products? (Author).
>
> What do you mean collaborate and share expertise? How can you share expertise? You either have it or you don't. No one can give it to you (T9).

With respect to job satisfaction, complex problem-solving and personal fulfilment gained from working through novel conundrums was important to the technicians. In a staff-room group discussion in which the technicians described what they enjoy about their work, technicians seven and eight said:

> I enjoy getting lost in the complexity of a thing, of the work. I also like being responsible for seeing a job through (T7).
>
> For me it's the satisfaction of working something through in my own mind, testing it out and coming up with a solution to a problem or question. There is a real sense of personal achievement when you do this (T8).

Learning

In terms of the technicians' interpretations of learning, the following quotes were again taken from a tea-break conversation about their learning experiences:

> Knowledge comes from personal learning and personal experience. Our knowledge requires years of formal study. You learn the theory at university and then apply the knowledge to the specific job... And you never stop learning. It's continuous (T4).
>
> Learning is part of the job. Once you leave university you learn by doing the job on a daily basis (T5).

The next quotes were extracted from a tea-break conversation in which I introduced the issue of learning through knowledge sharing:

> Do you learn from each other, by talking to each other and sharing ideas for example? (Author).
>
> Why would we waste our time talking about what we are doing? How would that help us to learn? We just get on with it – learn from our own mistakes not someone else's (T4).
>
> When it comes to the less experienced technicians, it's really a case of giving them advice and then letting them pick things up for themselves (ST).

Giving advice and then allowing the technicians the freedom to learn from personal experience can be defined as a weak form of collaboration. The emphasis however, was on a solitary individualistic form of experiential learning that may not be conducive to the collaborative research described in the technicians' new job descriptions.

Discussion

The conversations with the technicians suggested that they enjoyed the complexity, personal responsibility and individual autonomy of their work. Their interpretations of work were individualistic and they saw little point in collaboration and knowledge sharing. Their interpretations were also, it can be argued, partially shaped by their interactions with technology. The technicians' responses implied that their interpretation of experimental data was predicated on their knowledge of particular machines. This suggests an individual connection between a technician and his or her equipment.

A further interpretation of the data is that the laboratory layout engendered a sense of separation between technicians and promoted an individual way of working and an individualist interpretation of work. Alternatively, the technicians' individualistic orientations may well have shaped their response to spatial arrangements. Because they made autonomous decisions over task performance and because of the need for accuracy, the technicians did not wish to be distracted when working. This individualistic division of labour was linked to notions of individual responsibility, accountability and performance. Such individualistic conceptualisations of work are arguably incompatible with a collaborative conceptualisation of teamworking.

A key assumption of teamworking is that teams take collectively responsibility for specific projects. This assumption was incorporated into the technicians' new job descriptions. Collective responsibility was however, undermined by the sense of personal, individual accountability described above. The importance of personal autonomy was further evidenced in the sense of job satisfaction that technicians gain from individual problem solving and personal achievement.

The technicians' individualistic orientations were further entwined with their interpretations of learning and the importance of specialist technical expertise. Their conceptualisations of learning focused on the practical application of formal knowledge. Although this does not in itself imply an individualistic approach, it can be argued that ideas of personal learning and personal expertise and learning from one's own mistakes are integral to the technicians' rejection of knowledge sharing.

Analysis and Conclusion

Although teamworking in RDL as envisaged by senior managers was comparable to the high road model, it fell short of self-directing. The technicians would have little or no autonomy around work allocation and scheduling, but would be collectively responsible for dealing with absence and improvements to work procedures. The proposed teamworking was also about functional flexibility through collaboration and willingness to perform variable tasks. Senior Managers were attempting to harness the expertise and discretion of the technicians and channel it towards collaboration and knowledge sharing. However, the technicians used their expertise to create obstacles. They refused to use their bureaucratic expertise to develop new work procedures and refused to share their knowledge. They also demonstrated an understanding of the potential for work intensification in terms of taking responsibility for the work of absent colleagues. This is despite them, according to the PPM and HRD, never having failed to complete work on time.

The extent to which teamworking at RDL would facilitate or constrain autonomy is questionable. Teams might or might not be self-directed because team leaders may or may not fulfil the role of the ST. On the other hand, the traditional distribution of work was hierarchical. Like Hodgson and Briand's (2013) animators, the technicians' work was controlled by the decisions of senior managers. Control is thus present in both non-

teamwork and teamwork systems. Whilst teamworking may facilitate greater team-level autonomy, direct control can exist alongside some limited individual autonomy over task performance. The RDL technicians' responses suggested that they valued, and gained job satisfaction from, individual autonomy and personal responsibility. The implication is that technicians were not resisting accountability. Rather they were resisting a shift to collective rather than individual accountability.

Resistance at RDL also involved the reluctance of laboratory managers to initiate and support teamworking. The two managers refused to organise the technicians into teams and distribute work at a team-level. Technicians refused to share knowledge with one another or to use knowledge to develop systems to support teamworking. They also refused to apply for the team leader roles. Resistance further involved social sabotage in the form of a collective ridiculing of the PPM and teamwork stories.

The outcome of resistance to teamworking at RDL was not a failure to perform the work. The work was done despite the senior managers' fears that RDL's future ability to respond to customers in a flexible manner would be impaired. The implications for technicians were weak because their expert knowledge, alongside the collusion of the laboratory managers, provided the space to carry on as before. Senior managers recognised that sanctions would be difficult to impose and that persuasion was preferable. The result of the impasse was tension and conflict.

In terms of the implications for theory, this article supports previous labour process research (for example, Mulholland, 2004; Nichols and Beynon, 1977) which suggests that resistance can emerge in the absence of trade union involvement. In this instance however, informal resistance was supported by the collusion of laboratory managers. Their resistance was linked to a reluctance to engender conflict with people they must manage on a daily

basis. The article demonstrates that resistance can involve conflict between both managers and workers and between different management groups with different interests and interpretations. Resistance can also involve alliances across the management-worker divide. Moreover, resistance appeared to be fuelling further conflict as the PPM responded with anger and frustration.

A further implication of this research is that resistance need not necessarily be conceptualised as anti-work. Despite the fears of the PPM and HRD, the technicians' aim was not disruption or work avoidance. The technicians strived to do their job well; they took personal take pride in their work and demonstrated a commitment to individual rather than collective responsibility. The article thus shows that resistance can be oriented towards the interests of employees in their struggle for autonomy and personal fulfilment and, simultaneously, the interests of production.

Finally, the article shows that resistance can contain elements of both individualism and collectivism. It has been demonstrated that resistance can be rooted in an individualistic organisation of work and individualistic interpretations of the labour process. It can also be rooted in individualistic orientations which are linked to individual approaches to learning, job satisfaction, responsibility and accountability. The article does however, provide limited support for Mulholland's (2004) view that seemingly individual acts of resistance are underpinned by a degree of collective collusion in the form of shared interpretations and social sabotage. Social sabotage took the form of personal ridicule of the PPM and cynicism towards flexibility. Finally, the technicians' refusal to apply for the team leader posts was based on an understanding that this would constitute tacit acceptance of teamworking.

In conclusion, this article continues and extends the body of ethnographically-informed research that shows the complexities of teamworking and the locally constructed nature of

resistance. In this instance teamworking is rejected because it is interpreted as a means of reducing personal task-related autonomy in favour of team autonomy and responsibility.

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Acknowledgements

I would like to thank the anonymous reviewers and Professor David Collins for their helpful comments on earlier drafts of this article.

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