

Cooperative Work, Women and the Working Environments of Technology Design

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Susan: I guess you know all the staff except Reg are female. . . . I have found females, funnily enough, and it's a generalisation. But no it's not. We couldn't work this way if most of the staff weren't women. I have found that women, with this set up, that the women are much better at being part of the team and getting on with their tasks and responsibilities and looking across the network of people and understanding how what they are doing affects the rest of the network and vice versa. And thinking ahead. And thinking about relationships. And, like the Melbourne people are very isolated. And I'll talk about how we deal with that in a minute. But this team here are always very concerned, and they want to know about the Melbourne people, and how they are as people. And they often drop letters, just of their own volition down to Melbourne, to say "hullo" and cards and just things like that.

Toni: Things that women do?

Susan: Yes. Exactly. Yes.

INTRODUCTION

This paper stems from an interest in finding strategies to extend recent developments in feminist epistemologies into the practices that shape the design of information technology. Rationalist rhetoric still rules the working environments of technology design, and justifies the dominant managerial approaches to the organisation of work and to the design of technology to support that work. Nevertheless, there also exists a hardy tradition of what could be loosely described as phenomenologically-motivated system analysis and design methodologies. Central to these is the recognition that when people use technology in their work there are fundamental relations between the structure of the technology and how it is possible for people to 'be' as they live their working selves. Technology designers working from experiential perspectives seek to understand the lived experience of the actual users of technology as the basis for the design of information technology that is robust, flexible and useable in its specific situation of use. Moreover, experiential perspectives have traditionally been favoured by technology designers committed to enhancing workplace democracy by insisting that people have a right to influence their own workplace and their own work practices.¹ Feminist analyses of the production of knowledge have insisted on the necessary reliance on lived experience as a basis for the validity of theoretical claims. Grosz argued that this could be claimed as the major contribution of feminism to the production of knowledges. While I do not wish to imply any explicit or simple causal relationship it is noticeable

that feminists working in technology design have gathered within areas committed to experiential perspectives.

If we take to heart feminist and post-structuralist accounts of embodied subjectivity, then designing technology from the perspective of its use enmeshes us in the ways that technology design practices produce and reproduce the embodied capacities of those who use technology in their work. Put another way, designing information technology sometimes feels like living inside one of Foucault's books. Decisions, both explicit and implicit, are made and inherited at each stage in the technology design and development processes. These decisions can, in turn, embed historically specific, constraining and enabling structures in the technology itself and eventually in the work practices and organisational cultures of those who use it. The problem is that these decisions are nearly always made within working environments that have been defined by rationalist models of human cognition, interaction and embodiment, and essentialist understandings of gender. These are the models that are, by default, embedded in the technology developed in these environments and in the professional practices of those trained in these environments. Making alternative models visible within the working environments of technology design potentially offers a strategy to shape technology in ways that might offer less constraining work practices to those who use the technology in their work.

In this paper I want to reflect on the relations between the specific work practices that surround the use of technology in a small design company and the social practices and dominant meanings that define the environments where that technology might be designed and developed. I want to explore how it might be possible to speak, within these environments, about the relations between technology design practice and the communication skills required to successfully use some recent technology. This is not a straightforward task as communication skills are profoundly gendered and in many current workplaces are not recognised as skills at all. My aim is to uncover existing approaches, perspectives and techniques that can be used to fully take account of skilled communicative work and to shape the design of the technology developed to support that work. Finally, I want to consider the implications of making such skilled work visible both within the workplace itself and within the working environments of technology design.

The technology that interests me here has been made possible by the use of communications technology to link computer systems. The resulting computer applications can enable cooperative work between groups of people who may or may not be working in a shared physical space. In the working environments of technology design, this kind of technology is qualified by the acronym CSCW (Computer Supported Cooperative Work). CSCW technology enables people to share the same computer files either at the same time or at different times, and to exchange any other kinds of information that can be represented digitally. Electronic mail has been the most successful application of CSCW technology to date, but there are many others including teleconferencing, chat groups, virtual worlds, shared workspaces of various kinds, systems designed to control workflow within groups, and a range of applications that use audio and video channels to support browsing of distant workplaces.

The development of CSCW technology marks a major shift in the design and use of information technology, one in which human-to-human rather than human-to-machine communications and problem solving are emphasised.² Instead of the traditional focus of system design, where a single person uses a single machine to accomplish some part of their work, CSCW technology uses computers as an intrinsic part of the medium through which people communicate with each other. The implications of this shift are crucial both to the design of CSCW systems and to their implementation in the workplace. For those of us who recognise that our identities are shaped by our interactions with others, fundamental questions need to be addressed about the role that technology plays in structuring interpersonal communications. One such question is who sets the social protocols that both support and shape the interpersonal communication the technology mediates: the designers and builders of the CSCW systems, the management of the organisation that is implementing the system, or the people doing the communicating.³ Another question concerns the degree to which these protocols are considered as social and organisational issues, and the degree to which they are embedded in the specific CSCW systems. These questions have motivated the research that is considered here.

CONTEXT

This paper has its basis in a long-term field study of the work practices of a small distributed design company that made computer-based training and educational software products. The purpose of the study was to understand how a small group of people coordinated a cooperative design process when they spent most of their time in geographically separate places. The study was done as a CSCW research project within a technology faculty and was organised and realised from the perspective of technology design.⁴ The experiences and skills of the company members offered a valuable resource for CSCW researchers, particularly those seeking greater knowledge of the work environments where their systems might be used in the future. Studies of work practice are becoming increasingly common as the basis for phenomenologically-motivated approaches to technology design. This reflects the importance of detailed understandings of the social and situated nature of technology use and cooperative work,⁵ and the growing acceptance of this importance in technology design communities.⁶

The company studied had been operating successfully for over seven years. It had been distributed since it began, with its members working at home and gathering together for a weekly meeting in the home of one of the directors. Computer systems and communication technologies were used to provide crucial infrastructure support as well as communication links between its various members. Over time, the company members had developed a range of skills and practices that enabled them to coordinate their work within a distributed work environment. This was an environment where there were major geographical constraints on the time when they could be physically together, and equally major physical and technical constraints on the ease and effectiveness of communication when they were not.

During the study the company members negotiated and achieved a cooperative design process, without constant access to the communicative resources always implicitly available in same-site workplaces. Because co-presence was not an assumed resource for

the organisation of their work, the company members had to explicitly work at ensuring the steady and robust flow of communication between them. This work enabled them to create and maintain the context for their individual activities and to successfully work together over distance. Communication between them, while they were working apart, was mediated and supported by telephones, faxes, various postal services, couriers and an electronic bulletin board that supported the asynchronous exchange of computer files, including work in progress and electronic mail. Different company members could access and use separate copies of these files but were unable to share the use of a single file at the same time. Most importantly, work practices had been developed so that communication work was embedded in the work practices themselves. These included weekly meetings in a shared physical space, regular shared design work at those meetings, modularisation of work to fit the company's distributed practices, file naming schemes and procedures to notify others about files that were available to them.

The company was owned and managed by women, and seven of its eight members were women. It was established, in the first instance, when the two directors refused to work under the corporate culture imposed after a multi-national takeover of their previous employer. The agency of the company members, their control over their work, and their pleasure in its doing were central to the company's aims. The company's culture, organisational framework and work practices reflect these priorities. At the very beginning of the study I asked one of the directors, Susan, about the procedures and techniques the company had developed to enable them to work the way they did. She began her reply, paused in mid-sentence, looked at me for a few moments, then leant forward and made the statement that begins this paper.

Susan's statement, the sweeping generalisation of my question to her, and the affirmation of her response confirm, as it indeed seemed at the time, that we understood each other very well. Yet while this statement was so central to understanding the work of the company, it was some years before I could include it in accounts of the company's practices presented within the working environments of technology design. I do not intend to imply that there is necessarily any active prohibition, as such, to speaking specifically about women's work within those environments. But I do want to recognise that already existing meanings, and the social processes that produce them constrain what can be said within those environments. In essence the problem was how my colleagues might interpret Susan's statement and whether there was any hope of, or value in, attempting to establish a shared understanding of its implications for technology design. This paper is the result of the process of gathering the resources I needed to insist on Susan's statement being taken seriously within the environments where the technology her company used might be designed. The issue, for technology designers, is to ensure that the technology available to Susan's company, and others like it, is sufficiently flexible that it can support people working in ways of their own choosing.

Bratteteig and Verne articulate the problem of speaking about gender as a legitimate variable in studies of technology design and its effects on work, democratic rights and privacy:

The discussion of gender perspectives within the program is

problematic because it rests on assumptions of how women are, how women work, or how women participate in society: The discussion easily becomes a discussion of essentialism.⁷

Identifying and naming particular workplace skills as women's is not without its risks. Yet the use of highly developed personal communication, coordination, and relationship building skills was the central factor in the successful operation of this distributed company. They were respected skills in this company culture. Differences in personal communication skills and style, and responsibility for communication and relationship building work, remain unnamed variables in most studies of CSCW design and use. They are just not perceivable, let alone nameable, within the existing discourses and so remain absent from design discussion and decisions. Indeed, they remain largely unnamed and undefined within discussions about reward of skilled work in general, except, interestingly, at management level. Skill and style in communication, and responsibility for its vitality, are practices that are highly gendered, culturally differentiated, and usually unrecognised and unacknowledged. But taking seriously Susan's claim, 'We couldn't work this way if most of the staff weren't women', has important implications both for the design of CSCW technology and for feminist strategies to gain recognition and reward for women's workplace skills. The remainder of this paper examines possible strategies for making communicative work visible within the discourses of technology design and for recognising that, at this point in time, women are more likely than men to have learnt the skills necessary to accomplish this work. The implications of making communicative work visible are considered both in relation to the recognition of women's skills within distributed workplaces and to the design and implementation of CSCW technology.

MAKING COMMUNICATIVE WORK VISIBLE

It requires great care to speak about communication within the working environments of technology design. In these contexts communication is something that computers can do when they are linked together by communication technology. They encode, transmit, receive, and decode information in the form of discrete symbols. Successful communication occurs when the decoded discrete symbols on the receiving end are the same as those on the sending end. Within the social processes of making and producing meaning in technology design, the sender/receiver model of communication is assumed as the only appropriate model for both human and machine communication. That communications technology can successfully implement this model in an increasing range of media is a considerable achievement in itself. Moreover, it is precisely what makes the development of CSCW technology viable in the first place.

But the meaning of language is determined by its situation of use. In the environments of technology design it is problematic to speak of communication as a process that involves the ongoing negotiation of shared meaning and coordinated activity among people. Communication already means something else in that context and that meaning is by now so deeply embedded in the discourses of technology design that it plays its own role in producing those discourses over time. I worked in an information

technology environment for some time before I realised that when I spoke of communication my colleagues assumed I was talking about computers. At best I risked being interpreted as assuming the sender/receiver model as a metaphor for human communication. This means that in practice much of the work people do to accomplish communication and the coordination of their work is excluded from the model, and so remains outside the activities that those who design the technology recognise as deserving of support.

When I claimed that the successful functioning of the company depended on the work its members did communicating with each other, I meant communication where people constantly interact to create, negotiate, maintain, share and review meaning, understanding and knowledge, to enable cooperation and to build and maintain relationships. It is the work done to accomplish communication in this sense (the default meaning for the remainder of this paper) that Susan articulates when she states, 'I've found that women work much better in this situation'.

Disrupting Dualisms

The assumption of a sender/receiver model of communication renders invisible the work required to achieve a robust and flexible flow of communication between a group of people relying on communication technology. So to consider the skills required for the successful accomplishment of this communicative work, and the ways that they have become gendered, requires the consideration of the already excluded and the invisible. The excluded and invisible in rationalist models of human action, including the sender/receiver model of communication, is the same acting and perceiving embodied subject that is the excluded middle of the mind/body dualism. Cranny-Francis observed that feminists have sought to disrupt this and other dualisms since the 1970's as a strategy to change the social practices, particularly patriarchy, but specifically here the discourses of technology design, that are produced by such oppositions.⁸ This process has included rethinking human subjectivity using the subject's corporeality as a framework, instead of that provided by various dualisms.⁹

Feminist work that disrupts the splitting of mind from body and of reason from language, and challenges the privileging of the former over the latter, can be a useful resource for those technology designers working from experiential perspectives. These designers already use theoretical tools from other traditions that challenge rationalist assumptions about, and models of, human cognition and work. In turn, the existence of other theoretical approaches can provide resources for extending feminist rethinking of language, the body and human subjectivity into the working environments of technology design.

Naming Women's Workplace Skills

The extensive restructuring of Australian workplaces over recent years has included an increasing emphasis on skill audits as part of the process of award restructuring and the identification of training needs. Feminist researchers, concerned that

the failure to identify and acknowledge the character and value of women's skills might further disadvantage women in the workplace, have sought to recognise and name women's skills. Cox and Leonard's 1991 project matched unpaid community work skills with those in the paid workforce. Their argument was that many women develop technical, management, interpersonal and organisational expertise which is transferable into paid work situations.¹⁰ But they found that workplace recognition for language skills, communication abilities and learning is not gender neutral. Rather than the more complex multi-skilled requirements of the modern work group, workplace recognition and reward systems referred to those skills validated by formal training and certification, or to skill that lent themselves to an assembly line paradigm. Cox and Leonard found the activities that are most often seen as female, including communication skills, the competencies required to foster interpersonal relationships, the ability to do many things at the same time, and emotional and physical caring work were called 'natural' or 'gifts' rather than 'skilled'.¹¹ The study provided a list of some fifteen skills ranging from mediation, conflict resolution, and crisis management, to operating networks, managing invisibly, nurturing, and making a friendly ambience.¹²

Poynton and Lazenby's What's in a Word? project emphasised the central role of language in the construction of feminine and masculine identities.¹³ Their project used linguistic analysis to provide a way of defining a range of 'interpersonal' skills as 'technical' by recognising them as language skills. These language competencies were not limited to categories such as basic literacy or the ability to speak another language. A diverse range of skills that involve spoken and written language were specified. These are specific skills that are learned and finely honed by use.¹⁴ This understanding of language reflects feminist and post-structuralist arguments that language is not an external 'thing' that we have, but more a resource that is constantly used by embodied speakers in concrete situations.¹⁵

Neither "personality" nor "knowledge" can exist independently of language, or some form of communication. Language is not just the clothing we put on something else; language is the means by which knowledge, personality and relations between people are quite literally constructed. We *make* knowledge, ourselves and our relations with each other through the ways we learn to use language, particularly through talk. ...Learning to talk is also about learning when, where and how to talk in appropriate ways. And the evidence of the now substantial research on language and gender is that, to a considerable extent, girls and boys learn to talk in different ways.¹⁶

From this perspective, the work the company members did to enable them to work together over distance was achieved by their use of specific workplace skills, namely language skills, to produce and shape their work environment. This process included not just the quality and flow of information between the people involved, but the planning and coordination of the company's work, the building and maintenance of interpersonal relationships, the negotiation of specific power relations, and the intertwining of all of these to maintain the company itself.

Poynton argued that as girls and boys learn to use talk in different ways, there are no general or neutral language and communication skills.¹⁷ Instead these skills are embodied skills that we learn to enact in the processes through which we produce ourselves as girls and boys, women and men. The particular kind of 'training' that girls receive in language skills means that many more women than men are regarded as being good listeners, good communicators, and interested in relationships. But these labels render invisible the specific, active, moment-by-moment work that women do with language to achieve these qualities. Skills in interpersonal communication become simply a matter of personal qualities or personality. Language skills, as embodied skills, belong to the acting and perceiving body that disrupts the mind/body dualism, the inside/outside dualism of cognitivism and the sender/receiver model of human communication.

At this particular point in time, the embodied language skills that women are more likely to have acquired appear to give them a distinct advantage when they need to rely on the mediation of various kinds of technologies to work together over distance. Susan articulated the extent of the current difference between women's and men's workplace skills, within her particular work situation. She began by admitting that she was making a generalisation, but then she immediately contradicted herself in order to make the claim she wanted to make.

Susan: . . . and it's a generalisation. But no it's not. We couldn't work this way if most of the staff weren't women.

Within the environments of technology design and use, the insistence that language skills are embodied skills and the recognition of women's skilled use of language, risks interpretation as an argument in favour of existing essentialist definitions. Hanson and Pratt have identified two meanings of essentialism used within feminist literature.¹⁸ The first grounds all women's common experience in the female body, the second refers to speaking about women as a category of beings. Both have been criticised by feminists as historical and reductive. Both are implicit within the cultures of technology design. However, to insist that language is embodied, is not to imply uncritical support for current cognitive theories that locate sexual difference in the brain, including in its structures of language acquisition. Nor is it to argue that differences in communicative capacities between women and men are necessarily biologically determined. As Grosz points out:

However understandable the charges of essentialism may be . . . they presume that only anatomical, physiological, or biological accounts of bodies are possible, obscuring the possibilities of sociocultural conceptions of the body and ignoring the transformations and upheavals that may transform biological accounts. Nonbiologicalistic, nonreductive accounts of the body may entail quite different consequences and serve to reposition women's relations to the production of knowledges.¹⁹

In patriarchal societies that constitute embodied subjects on the basis of sex, we have little choice but to work within these categories. But this is not to ignore or deny that they, and the relations between them, are constructed. Recognition of women's workplace skills depends on our insisting that they are women's skills because of the

position that women occupy in relation to men, and not because the skills themselves are in any sense inherently gendered.²⁰ It should be possible to speak of women as a group in particular contexts, like working within distributed companies, without being bound to a commitment that nature has determined the particular grouping. When Susan says ‘. . . and it's a generalisation. But no it isn't’, perhaps she is not contradicting herself at all. The generalisation she wants to deny might be her unwillingness to speak of all women as a single category. The ‘But no it isn't’ then becomes an acknowledgment that the category of women is indeed a valid one, though not a ‘natural’ one, within the specific historical and cultural context of her company's organisation and work practices. ‘I have found that women, *with this set up*, that the women are much better at . . . ‘ (my emphasis).

This is not an easy, nor particularly welcome, distinction to make within those working environments where differences in communication skills and interests between the sexes are regarded as natural. Both the discourses that surround technology design and those that shape our workplaces have a stake in the perpetuation of essentialist categories. Rendering the skilled nature of women's communicative work invisible, by disguising it as natural, means that the forces that perpetuate inequalities based on sex can be disguised as natural as well. In the working environments of technology design, the result is its practice being perceived and organised as the natural domain of men and the assumption that those who use the technology are other men just like the designers. The theoretical exclusions that render invisible women's skilled use of computer systems and communication technology are perpetuated.

EXPLOITING EXISTING THEORETICAL RESOURCES WITHIN TECHNOLOGY DESIGN ENVIRONMENTS

The work of feminist language analysts has provided useful tools to make communicative work visible in the workplace, including the workplaces of technology designers. I want to suggest that the feminist reconceptualisation of language as embodied skill can both support and be extended by already existing challenges to rationalist assumptions and models of human cognition and work within CSCW. The aim is to use this feminist work categorising women's language skills as key workplace skills to emphasise the centrality of these skills to core workplace activities - particularly the successful use of CSCW technology. This can then provide a valuable resource to those technology designers seeking to build technology that enhances the capacities of those who use it to control their own work practices. At the same time feminist theory gains an opportunity to be applied within technology design practice.

Challenges to rationalist assumptions and models of action within the environments of technology design have come through approaches to human cognition that include situated action,²¹ situated cognition²² and distributed cognition.²³ Each approach intentionally disrupts the inside the head/outside the head dualism of traditional cognitive science that has, in turn, been the unfortunate basis of so many aspects of information technology design.²⁴ Moreover, the acting and perceiving body, interacting with its environment, also constitutes the excluded middle of the inside/outside dualism. This offers an important and useful point of convergence with feminist rethinking of the body as a tactic to disrupt the mind/body opposition. Cranny-Francis suggested that ‘for

feminist writers, to challenge the mind/body dualism was and remains a political act'.²⁵ For feminists working in technology design challenging cognitivism has a similar urgency. Lucy Suchman's book Plans and Situated Actions remains the most substantial and unanswerable challenge to cognitivism within technology environments. She defined an ethnomethodological view of action that emphasised the public availability of both actions and the world in which they are performed. Suchman's concept of situated action has become a 'given' in the design of human-computer interaction and CSCW research though its implications are still contested and frequently misunderstood. Situated action provides a way of making visible the role of interaction and context in organising behaviour. It recognises that human action is always situated; that is embodied action that always occurs within a context of particular, concrete circumstances²⁶.

Hutchins emphasised the importance of embodied communicative activity in distributed cognition and human action.²⁷ Distributed cognition assumes that all action is situated and is concerned with the nature and properties of an entire functional system that includes people and their environment. Cognition is not defined as a process occurring inside an individual's brain, but instead is considered as distributed across individuals and the environment in which it takes place. That is to say, cognition is a social and cultural activity that always occurs in a specific setting. Distributed cognition aims to find a way to incorporate the interactions between individuals and the environment in which they are situated, including shared artefacts in that environment, so as to understand how these different components of the particular functional system are coordinated. Understanding cognition in this way offers resources to make visible the work of communication between people involved in shared work. Importantly for my concerns here, Hutchins emphasised the role of embodied communicative activity in distributed cognition because it is this activity that enables information to be propagated through the functional system. He argued that 'the cognitive properties of a group may depend as much on the system of communication between individuals as on the cognitive properties of the individuals themselves'.²⁸ Viewed in this way, embodied communication skill and style are important components both in the achievement of robust communication and in the way work is negotiated. Distributed cognition has been used in CSCW as a framework to approach sociological issues of the organisation of work in a range of workplaces, particularly those where people's work demands ongoing awareness of what others are doing and why.

Another way to emphasise the centrality of language skills to core workplace activities, particularly in CSCW workplaces, is through the concept of articulation work. Articulation work is the work required to mesh different elements – tasks, artefacts, people, organisational structures – into a coherent process. It has been argued that supporting articulation work is a key issue, if not *the* key issue in CSCW.²⁹ It is reasonable to assume that researchers and designers of CSCW systems would be familiar with the term although its implications for technology design are still contested. Articulation work is work that is situated and invisible to rationalised models of work.³⁰ Suchman linked the focus on articulation work in design discourse to the development of a system design practice that is consistent with some recent feminist analyses of technological production and use.³¹ She argued that 'Bringing it [articulation work]

forward, and rendering visible the practical reasoning and action that it requires, challenges existing political economies of knowledge'.³²

In the statement that forms the focus of this paper, Susan defined some of the kinds of work required for the successful operation of a distributed company.

Susan: ...I have found that women, with this set up, that the women are much better at being part of the team and getting on with their tasks and responsibilities and looking across the network of people and understanding how what they are doing affects the rest of the network and vice versa. And thinking ahead. And thinking about relationships. .

The work Susan is describing is articulation work. Moreover, she claimed that women are much better at it. Given that articulation work has been established as a central concept in the discourses of CSCW, it potentially offers a way to render communicative work visible within technology design environments. As communicative work is also articulation work, and the skills utilised in communicative work are currently gendered, then we can make similar claims, as Susan does, about the accomplishment of the articulation work required to work successfully in a distributed company.

There is further advantage in reframing embodied language skills as articulation work. If we follow Suchman's argument, and bring forward the practical reasoning and action that articulation work requires, then the value of communicative work becomes more evident. By reframing language skills as articulation work and recognising all actions, including speaking, as situated, we can strengthen challenges to cognitivism by insisting that 'women's' communicative skills are, in fact, cognitive. This is not to stuff communication back inside heads and reinstate a mind/body split, or to privilege cognition as the origin of communicative action.³³ On the contrary, to insist that communication skills are cognitive is to support existing efforts by those relying on resources provided by situated action and distributed cognition to retheorise cognition as situated action.

Viewed from the perspectives discussed in this section, the communicative work achieved by the members of our distributed company is defining of the work of the company itself. The sender/receiver properties of the communication medium are merely the physical prerequisites for effective communication to occur. Thinking, creative solutions and the successful outcome of the processes of cooperative design are directly determined by differences in personal and cultural communication, coordination and relationship building skills, and the ways that these are embedded in embodied activity, artefacts, work practices and organisational routines.

IMPLICATIONS OF MAKING COMMUNICATIVE WORK VISIBLE

When communicative work is visible then its contributions to the achievement of cooperative work within distributed workplaces can affect both the value placed on that work, and the design of technology to support it. This is not to say that this work does not

contribute to the achievement of cooperative work in same-site workplaces. On the contrary, the ability to cooperate and communicate are becoming increasingly important to the effective functioning of any workgroup, whatever its physical organisation. Moreover, working in teams involves complex practices of negotiating power, cooperativeness and responsibility, and these require the skilled use of language to speak in appropriate ways.³⁴ But the difficulties of coordinating work, when the communicative resources of co-presence are not generally available, makes crucial the use of specific language skills to enable the productive utilisation of mediating technology. It also demands technology that is capable of being utilised by people skilled in communicative work.

Implications for the Recognition of Women's Skills in Distributed Workplaces

Cockburn argued for the need to dismantle the links between gender and jobs. 'Anything short of this can be converted by men into a new source of power'.³⁵ Even with full industrial recognition of the specific language skills that women have and their full visibility within the discourses of technology design and use, their continued attribution as women's skills will merely see them devalued. Poynton and Lazenby, and Cox and Leonard recognised that women have learnt to undervalue their workplace skills, at the same time as they have learnt the skills themselves.³⁶ These researchers argued for strategies to encourage and enable women to identify and articulate their strengths and competencies.

Developments in computer systems and communications technology have increased the range of communicative support available to people working together over distance. These developments have been exploited by companies like Susan's, whose members already work this way, as well as by organisations and individuals altering their work practices so that some, or all of their work, can be done from home. More people, mostly women, are working from home.³⁷ But studies of home-based work that involves computer use have shown that the sexual division of labour is being extended into these distributed domestic workplaces. The advantages and disadvantages of home-based work are proving to be determined by the gender of the worker.³⁸ As more people work from home, their ability to coordinate their work with others will be shaped by how effectively they utilise the communicative options, including CSCW technology, available to them. The culture of the company I studied ensured that communicative work was visible, valued and rewarded. The company members were not clerical workers, but designers of multi-media software with skills that are still in high demand in the Australian labour market. In other work environments and industries, failure to recognise and value the skills entailed in communicative work and their fundamental contribution to productivity, leaves women vulnerable to the appropriation of their competence in these areas by their employers and/or their clients.³⁹

An increasing number of women are running their own businesses. Those operated by women are more likely to employ women and they have a significantly higher survival rate, due both to better preparation prior to start up and to skilled management.⁴⁰ The creation of appropriate communication environments and the

planning and delivery of work in cooperative working groups are management skills that are crucial to the survival of businesses. The recognition that many women already do the kind of interpersonal work these skills enable may represent the first step in a long-term strategy for gaining recognition and appropriate recompense for women's language and communication skills.⁴¹ At the same time, it may encourage more women to create their own work environments, including distributed workplaces that use CSCW technology, where the benefits of their communicative work skills accrue directly to them.

Implications for the Design and Implementation of CSCW Technology

My field study of cooperative work uncovered the interplay of organisational and technological solutions to the communication problems of distributed workplaces. The company members' skills in the use of language enabled them to exploit whatever communication options were available. In a distributed company a workforce valued and rewarded for their skill in communicative work can utilise appropriate technological support productively and effectively. A workforce whose communicative work is not recognised, or whose members lack the appropriate language skills, will *not* utilise technological support productively and effectively. This will be the case even if the technology itself is robust and/or expensive and/or impeccably designed. That is, technological solutions, irrespective of the environment where they are designed, will not solve the range of communication problems inherent in distributed workplaces without skilled communicative work by the people who use them. At the same time the value of CSCW technology, to a workforce of skilled and valued communicators, will be increased if it is designed to be sufficiently flexible to accommodate the highly specific ways that language is used to accomplish specific instances of communicative work.

A sobering implication of the importance of communicative work is the development of CSCW systems that embed the agency for achieving that work in the technology itself. In this technology the system is designed to structure and organise the kinds of interpersonal communication that can occur. This issue has become central to the politics of CSCW systems design.⁴² If communicative work remains invisible or unvalued, or if the workforce lacks the language skills or the collective will necessary to achieve it, then the easy solution is to build the coordination of work into the technology itself. My analysis of women's skills in the use of computer systems and communication technology suggests that structured coordination systems disadvantage women by neutralising the advantages held by those who have learnt the necessary skills to effectively structure their own communicative work. Moreover if people are structuring their interpersonal workplace communications through various media provided by technology then their embodied capacities for communicative actions are recoded by the bodily procedures that the new technology demands of them. It is tempting to think that Foucault had the recoding of embodied action, required to successfully use structured coordination systems in mind when he wrote, 'A disciplined body is the prerequisite for an efficient gesture'.⁴³ There is a great deal at stake in whose interests and definitions of efficiency shape the gestures of people, as their communicative interactions are recoded for mediation by CSCW technology.

CONCLUSIONS

It is important to remember that the specific shape of particular technology is constantly contested within the environments where it is designed, built and implemented. Taking seriously Susan's claim, 'We couldn't work this way if most of the staff weren't women', has demanded a consideration of how women's skills in communicative work might be named and made visible within the working environments of technology design and use. Despite the ubiquity of the sender/receiver model of communication and other rationalist oppositions within these environments, concepts like articulation work and the approaches of situated action and distributed cognition, offer strategic resources for disrupting these dualisms by making communicative work visible. In turn, an understanding of communicative work can make visible the skills required for the successful use of computer systems and communication technology. This at least creates opportunities, for those technology designers working from experiential perspectives, to shape the technology they build and/or implement in ways that ensure that those people who rely on CSCW technology, can structure their interactions with others themselves.

Feminist research, aimed at identifying and naming women's workplace skills, has provided resources for analysing the skills involved in communicative work as both gendered and embodied. And theories that stress cultural constructions of embodiment over essentialist explanations, enable us to argue that these skills are not themselves inherently gendered but available, with appropriate training, to both women and men. This is not to say, however, that women should not position themselves to benefit from the skills that their historical and cultural position makes them more likely to possess, particularly those involved in the use of communications technology to coordinate and accomplish distributed work. Strategies, that enable the inclusion and analysis of the communicative work involved in the successful use of CSCW technology, can be used to insist on both the recognition of that work in the workplace and its inclusion in the discourses of technology design.

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¹ Technology designers working from these perspectives practice participatory design techniques and methods. Participatory design has its roots in the Scandinavian tradition of systems design that has historically focused on the active involvement of a largely unionised workforce in the development of the computer systems they will use in their work. See for example Suzanne, Bødker, J. Knudsen, Morten Kyng, Pelle Ehn and Kim Madsen, 'Computer Support for Cooperative Design', in CSCW '88, Proceedings of the Conference on Computer-Supported Cooperative Work, Portland, Oregon, USA, September 26-29, 1988 (ACM Press) New York, 1988, pp. 377-398; Joan Greenbaum and Morten Kyng (eds) Design at Work: Cooperative Design of Computer Systems (Lawrence Erlbaum Associates) New Jersey, USA, 1991; and Doug Schuler and Aki Namioka (eds) Participatory Design: Principles and Practices (Lawrence Erlbaum Associates) New Jersey, USA, 1993. This tradition, in turn, is linked to preceding socio-technical commitments to increasing workplace democracy and participative practices of job design, whether or not computer technology was involved. More recently attention has been given to defining a role for participatory design in product development companies, particularly in North America. Participatory design has been influential in the development of systems to support cooperative work because it is a tradition that is based on both the cooperative design of systems as well as the recognition of the cooperative and social nature of work. See Bødker et al. 'Computer Support for'; Greenbaum and Kyng, Design at Work. Practitioners argue that technology design methods begin from an understanding of the users of technology as actors in situations. Because the design of computer support is the design of the conditions for the future work situations of the

users, these conditions need to be designed with concern for the practice and cooperation of the involved groups.

² Tom Moran and Bob Anderson, 'The Workaday World as a Paradigm for CSCW Design' in CSCW '90, Proceedings of the Conference on Computer-Supported Cooperative Work, Los Angeles, California, USA, October 7-10, 1990 (ACM Press) New York, 1990, pp. 381-393; Liam Bannon, 'From Human Factors to Human Actors: The Role of Psychology and Human-Computer Interaction Studies in System Design' in Joan Greenbaum and Morten Kyng (eds), Design at Work: Cooperative Design of Computer Systems (Lawrence Erlbaum Associates) New Jersey, 1991, pp. 25-44; R.M. Baecker, Groupware and Computer-Supported Cooperative Work (Morgan Kaufmann), San Francisco, 1993.

³ Joan Greenbaum, 'In Search of Cooperation: An Historical Analysis of Work Organisation and Management Strategies' in CSCW '88, Proceedings, pp. 102-114; Andrew Clement, 'Cooperative Support for Computer Work: A Social Perspective on the Empowering of End Users' in CSCW '90, Proceedings, pp. 223-236; Lucy Suchman, 'Do Categories Have Politics? The Language/Action Perspective Reconsidered' in G. De Michelis, C. Simone and K. Schmidt (eds), Proceedings of the Third European Conference on Computer-Supported Cooperative Work, Milan, Italy, September 13-17, 1993 (Kluwer Academic Publishers) Dordrecht, 1993, pp. 1-14; Terry Winograd, 'Categories, Disciplines, and Social Coordination', Computer Supported Cooperative Work, vol. 2, no. 3, 1994, pp. 191-197; Liam Bannon (ed), 'Commentaries and a

Response in the Suchman-Winograd Debate', Computer Supported Cooperative Work (CSCW), vol. 3, no. 1, 1995.

⁴ For detailed accounts of the company's work practices see: Toni Robertson, 'Embodied Actions in Time and Place: The Design of a Multimedia, Educational Computer Game', Computer Supported Cooperative Work: The Journal of Collaborative Computing, vol. 5, no. 4, 1996, pp. 341-367; Toni Robertson, 'The Constraints and Resources of a Distributed Workplace', in Proceedings of Oz-CSCW '96, August 30th, 1996 (DSTC), Brisbane, 1996, pp. 57-65; Toni Robertson, "'And it's a generalisation. But no it's not": Women, Communicative Work and the Discourses of Technology Design' in Proceedings of the Sixth International IFIP WG 9.1 Conference on Women, Work and Computerisation, Bonn, Germany, May 24-27, 1997 (Springer) New York, 1997, pp. 263-275; Toni Robertson 'Cooperative Work and Lived Cognition: A Taxonomy of Embodied Actions' in Proceedings of the Fifth European Conference on Computer-Supported Cooperative Work, Lancaster, UK, September 7-11, 1997 (Kluwer Academic Publishers) Dordrecht, 1997, pp. 205-220; Toni Robertson, 'Shoppers and Tailors: Participative Practices in Small Australian Design Companies', Computer Supported Cooperative Work: The Journal of Collaborative Computing, vol. 7, no. 2-3, 1998, pp. 205-221; Toni Robertson, 'Building Bridges: Negotiating the Gap Between Work Practice and Technology Design', The International Journal of Human-Computer Studies, vol.52, (in press), 2000.

⁵ Kjeld Schmidt and Liam Bannon, 'Taking CSCW Seriously. Supporting Articulation Work', Computer Supported Cooperative Work, vol. 1, no. 1-2, 1992, pp. 7-40.

⁶ For a review of workplace studies from CSCW see Lydia Plowman, Yvonne Rogers and Magnus Ramage, 'What Are Workplace Studies For?' in H. Marmolin, Y. Sundblad and K. Schmidt (eds), Proceedings of the Fourth European Conference on Computer-Supported Cooperative Work, Stockholm, Sweden, September 10-14, 1995 (Kluwer Academic Publishers) Dordrecht, 1995, pp. 309-324.

⁷ Tone Bratteteig and Guri Verne, 'Feminist or merely critical? In search of gender perspectives in Informatics' in Gender, Technology and Politics in Transition Workshop, Technology and Democracy: Comparative Perspectives Conference, Oslo, January 17-19, 1997 p. 3.

⁸ Anne Cranny-Francis, The Body in the Text (Melbourne University Press) Victoria, 1995, p. 6. See also, Moira Gatens, Imaginary Bodies: Ethics, Power and Corporeality (Routledge) London, 1996, pp. 49-59; Judy Wajcman, Feminism Confronts Technology (Pennsylvania State University Press) Pennsylvania, 1991, p. 5.

⁹ Elizabeth Grosz, Space, Time and Perversion: The Politics of Bodies (Allen & Unwin) Sydney, 1995.

¹⁰ Eva Cox and Heather Leonard, From Ummm . . . to Aha! Recognising Women's Skills Research Report, (Australian Government Publishing Service) Canberra, 1991, p. 5.

¹¹ Cox and Leonard, From Ummm . . . to Aha!, pp. 18-19.

¹² Cox and Leonard, From Ummm . . . to Aha!, pp. 39-40.

¹³ Cate Poynton and K. Lazenby, What's In a Word? Recognition of Women's Skills in Work Place Change Research Report (South Australian Department of Labour) Adelaide, 1992.

¹⁴ Cate Poynton, 'Naming women's workplace skills: linguistics and power' in Belinda Probert and Bruce Wilson (eds), Pink Collar Blues: Work, Gender and Technology (Melbourne University Press) Victoria, 1993, p. 86.

¹⁵ Poynton, 'Naming women's workplace skills', p. 89.

¹⁶ Original emphasis, Poynton and Lazenby, What's In a Word? p. 12.

¹⁷ Poynton, 'Naming women's workplace skills', pp. 85-100.

¹⁸ S. Hanson and G. Pratt, Gender, Work, and Space (Routledge) London, 1995, p. 23.

¹⁹ Grosz, Space, Time and Perversion, p. 31.

²⁰ Poynton, 'Naming women's workplace skills'.

²¹ Lucy Suchman, Plans and Situated Actions (Cambridge University Press) New York, 1987.

²² William Clancey, Situated Cognition (Cambridge University Press) New York, 1997.

²³ Edward Hutchins, Cognition in the Wild (MIT Press) Massachusetts, 1995.

²⁴ For example, the field of Human-Computer-Interaction (HCI) developed from cognitive psychology. Decision Support Systems assumed cognitive models of human decision-making. Management Studies and Artificial Intelligence have both relied on the cognitivist information processing model of human cognition. Whitaker defined cognitivism thus: 'Humans are viewed as symbol processing systems whose essential behaviours can be accurately modelled by abstract formalisms realised via computer based operational models (simulations), logical models, quantitative models and formal grammars' (Randall Whitaker, 'GDSS' Formative Fundamentals', Computer Supported Cooperative Work (CSCW), Vol. 2, No. 4, 1994, pp. 239-260, see p. 252); and from Dreyfus : 'Cognitivism is rationalism plus the computer as a model of how this rationalist account of mind actually works' (Herbert Dreyfus, 'The socratic and platonic basics of cognitivism', AI and Society, Vol. 2 1988, pp. 99-112, see p. 100). Cognitivism, when used as an applied methodology for systems design, perpetuates the Cartesian mind/body dualism by segregating and privileging cognitive phenomena and ignoring how thinking

is achieved in practice and how actions, including thinking, always occur in a physical and social world.

²⁵ Anne Cranny-Francis, The Body, pp. 6-7.

²⁶ Lucy Suchman, Plans, p. viii.

²⁷ Hutchins, Cognition.

²⁸ Hutchins, Cognition, p. 239.

²⁹ Schmidt and Bannon, 'Taking CSCW Seriously'.

³⁰ Anselm Strauss, 'Work and the Division of Labor', The Sociological Quarterly, vol. 26, no. 1, 1985, pp. 1-19; E.M. Gerson and Susan Leigh Star, 'Analysing Due Process in the Workplace', Transactions on Office Information Systems, vol. 4, no. 3. 1986, pp. 257-270; Susan Leigh Star, 'Invisible Work and Silenced Dialogues in Knowledge Representation' in I. Eriksson, B. Kitchenham and K. Tijdens (eds), Women, Work and Computerisation: Understanding and Overcoming Bias in Work and Education (North Holland) Amsterdam, 1991, pp. 81-92.

³¹ Lucy Suchman, 'Supporting Articulation Work' in I. V. Eriksson, B. A. Kitchenham and K. G. Tijdens (eds), Proceedings of the Fifth IFIP WG 9.1 International Conference

on Women, Work and Computerisation: Breaking Old Boundaries, Building New Forms (Elsevier) Amsterdam, 1994, pp. 46-60. For feminist analyses of technological production and use see Belinda Probert and Bruce Wilson (eds), Pink Collar Blues: Work, Gender and Technology (Melbourne University Press) Victoria, 1993, pp. 85-100; E. Green, J. Owen and D. Pain, Gendered by Design? (Taylor & Francis Ltd) London, 1993; Judy Wajcman, Feminism Confronts, p. 5; Cynthia Cockburn, Machinery of Dominance: Women, men and technical know-how (Northeastern University Press) Massachusetts, 1988.

³² Suchman, 'Supporting Articulation', p. 51.

³³ Stephen Woolgar, 'Reconstructing man and machine: A note on sociological critiques of cognitivism' in W. Bijker, T. Hughes and T. Pinch (eds), The Social Construction of Technological Systems (MIT Press) Cambridge, 1987, p. 313.

³⁴ Poynton and Lazenby, What's In a Word?

³⁵ Cockburn, Machinery of Dominance, p.249.

³⁶ Poynton and Lazenby, What's In a Word? p.42-61; Cox and Leonard, From Ummm ... to Aha!, p.19.

³⁷ Women's Bureau, Department of Employment, Education and Training, 'Working From Home', Women & Work, vol. 17, no.1, 1996, p.3.

³⁸ Judy Wajcman, Belinda Probert and R. Tanter, 'Bringing It All Back Home: A study of new technology homework in Australia' in K. Tijdens, M. Jennings, I. Wagner and M. Weggelaar (eds), Women, Work and Computerisation: Forming New Alliances (North Holland) Amsterdam, 1989, pp. 37-43; W. Dawson and J. Turner, When She Goes to Work She Stays at Home: Women, new technology and home-based work (Australian Government Publishing Service) Canberra, 1989.

³⁹ Wajcman, Probert and Tanter, 'Bringing It All Back Home', pp. 37-43.

⁴⁰ National Board of Employment, Education and Training, Making It Work: Women and Small Business Research Report (Australian Government Publishing Service) Canberra, 1994.

⁴¹ Poynton, 'Naming women's workplace skills'.

⁴² For a range of different views on CSCW applications that structure the interactions of those who use them see, Suchman, 'Do Categories Have Politics?'; Winograd, 'Categories'; Bannon, 'Commentaries'.

⁴³ Michel Foucault, Discipline and Punish (Penguin) UK, 1977, p. 152.