Proceedings of the Fourth European Conference on Computer-Supported Cooperative Work,
September 10–14, Stockholm, Sweden
H. Marmolin, Y. Sundblad, and K. Schmidt (Editors)

Cooperation and Power

John Sherry
Department of Anthropology, University of Arizona, Tucson, Arizona USA

New technologies are not only transforming workplace practices in familiar settings They are also finding their way into the types of "exotic" locales which have traditionally been of interest to anthropologists. This paper presents an ethnographic analysis of technologically mediated communication in one such atypical setting, among a grassroots group of activists from the Navajo Indian Reservation in the southwestern United States. As this case illustrates, mere access to technology does not solve all of the problems such groups face in terms of empowerment, access to resources for action, and coordination. The discursive practices embodied in technological design may perpetuate the relations of dominance and subordination which characterize interactions between "marginalized" groups and "mainstream" organizations, and force groups into forms of organization which they find inappropriate

Introduction

Not long ago, a fax was sent from the deep among the douglas firs in Oregon to a home built in the forests of junipers and ponderosa pines high in the mountains on the Navajo Indian Reservation in Arizona The fax predicted

> The grassroots network of the future will be a virtual organization with virtual members It will exist in cyberspace - everywhere and nowhere Its currency will be information, and its location a collection of E-mail addresses and fax numbers

The very presence of this message seemed proof of its own veracity. CSCW, it appears, is coming out of the labs, academic settings and offices where it was developed and winding up in some unusual places As grassroots organizations, people from non-Western societies, and other users gradually gain access to these technologies, current issues may be viewed in a new light, and unanticipated problems will inevitably arise As new users bring increased diversity with regards to cultural and linguistic backgrounds, approaches to work, and attitudes towards technology, applying the concepts of participatory design and the democratizing of information may become increasingly difficult but all the more important

This paper analyzes the use of information and communications technologies by one such non-prototypical group It represents an attempt to further develop two related lines

of investigation which have concerned CSCW researchers in the past, that is, heterogeneity and power in cooperative networks Much research in CSCW has demonstrated the fact that cooperative work "in real world settings" is marked by considerable heterogeneity with respect to orientation and approaches to work (Kling, 1980 Schmidt & Bannon, 1992) Closely related has been the awareness that cooperative work can be affected by significant differences in the respective statuses of participants Work in CSCW and in Participatory Design (PD) has emphasized the goal of democratizing the computing process (e g , Schuler & Namioka, 1993) Participatory design has pointed out that workers' knowledge and multiculturalism in the workplace provide valuable sources for information and innovation (e g , Greenbaum, 1992) Many discussions in CSCW have likewise emphasized the importance of empowering end users and democratizing information (e g , Clement, 1990) Analyses of power in CSCW have in this respect primarily focused on issues of organizational relations dealing with information flow, the ability to make or implement technology choices, and local autonomy in the conduct of work (cf Schmidt & Bannon, 1992)

For this discussion, I would like to examine heterogeneity and power in cooperative networks from a slightly different perspective, one which is currently fairly popular in anthropological discussions of "hegemony", based on such analyses of power as Gramsci (1992) and Foucault (1973, 1977) Ethnographers have demonstrated that relations of power can be constructed through "discursive practice" (cf Goodwin, 1994), that is, through the practices associated with the construction of knowledge Since one's "choice of representations limits the sorts of inferences that make sense" (Hutchins, 1995 82), the construction of knowledge is always - and necessarily - subject to limitations on what can be said, by whom, and in what way (cf Foucault, 1973) Power and the construction of knowledge are in this respect inseparable

Discursive practice can include more than simply spoken discourse, encompassing as well the way a group constructs and employs all sorts of representational artifacts and media As many have pointed out with regards to technology (cf Norman and Draper, 1986, Suchman, 1987, Adler & Winograd, 1992) the design of technological artifacts can embody particular practices that may or may not be suited to the people who wind up using them Furthermore, as Brown & Duguid (1994) point out, communities may adopt "border conventions", standards of practice which allow people to derive meaning from more than just "what is said" by an artifact When artifacts and their accompanying

practices are used to connect interactants from divergent communities, the result may be a situation in which one participant is forced to adopt the practices of the other, at the expense of his or her own standards My concern here is thus "How do the discursive practices embodied in technologies for cooperative work construct relations of dominance?"

This is not to say that the problem of conflicting discursive practices is solely the result of new technologies "Culture collision" has been a part of the human experience probably for as long as there have been peoples coming in contact who speak different languages and hold different beliefs The problem has about a five hundred year history for the indigenous peoples in the America The history of Indian relations with Eruopean colonizers is often thought of as somehow "complete", as if early conquests and the violent contact precipitated by the doctrine of "manifest destiny" were somehow played out However, for many Indian people, the history of relations - and conflict - with the Euro-American political and economic system is still in progress Part of this story lies in the different approaches to communication which characterize relations between Indian and non-Indian people As many researchers have shown, interactional differences in face to face settings - for example, in turn-taking norms, in the structuring of discourse, in the lengths of pauses speakers usually take between utterances or between turns at talk - can serve to disadvantage many Native American speakers in conversational situations with non-Indians, especially middle class Euro-Americans These patterns have been shown to be fairly consistent among people of different North American tribes (e g , Philips, 1983, Scollon and Scollon, 1981, Hymes, 1974) Discursive practices have in these situations been clearly shown to affect the construction of power in interactions, as well as the evaluations which participants make of each other But even while the problem is not new to technology use, it bears renewed interest from a CSCW perspective It is obviously important to technology users coming from a marginalized community, since foreign ways of representing information can present a barrier to cooperation, or perpetuate their own subordination This issue may be of interest to CSCW research as well, since it illustrates what Anderson (1994) considers a primary goal of ethnography in CSCW research, that is, to understand the "play of rationalities" that occurs when local and non-local practices collide. As technologies become dispersed, and are used to facilitate interaction among ever more heterogeneous networks, assumptions about what constitute "natural" forms of interaction may be increasingly called into question The concerns of local communities of

resistance and CSCW researchers thus meet when the introduction of foreign technologies and their associated practices results in a "play of rationalities" that is carried out as an explicit (and often morally charged) conflict

The Research Setting

This paper is based on ethnographic fieldwork among a grassroots organization of environmental activists called "Diné CARE"[1], from the Navajo Indian Reservation in the southwestern United States I use the term "environmental activists" only provisionally here, because these people themselves do not like the title They regard their work as the continuation of a centuries-old resistance to foreign colonialism, rather than environmentalism as it has come to be thought of in American - and perhaps Western European - societies In addition, Navajo "environmentalism" has deep cultural roots, which stem from a fundamentally different way of relating to the environment than that embodied in Western industrial societies (cf LaDuke, 1983) However, because the group often collaborates with non-Indian environmentalists, and because many Indian ways of thinking have been appropriated by non-Indian environmental movements, distinctions between traditional resistance and these modern movements have been blurred

The Navajo Nation covers about 23,000 square miles (60,000 km^2 - approximately the size of Ireland) in the American Southwest. There are between 150,000 and 200,000 Navajo people living within reservation boundaries Many of the people living on the reservation over the age of about seventy are monolingual Navajo speakers Most adults over age thirty speak both English and Navajo

The technologies used by the people with whom I worked may not be particularly sophisticated from a CSCW perspective, but they shed light on some important issues about technologically mediated cooperation in novel settings Cooperation among Navajo communities of resistance can be divided into two types that between the various, geographically dispersed communities of resistance that form Diné CARE, and that which is carried out between these communities (or the organization Diné CARE as a whole) and

[1] Diné is the word Navajo people use to refer to themselves CARE stands for "Citizens Against Ruining our Environment"

the numerous sources of technical, legal, financial or other forms of support which lie outside the reservation. Because of the Navajo Nation's size and low population density, members of Diné CARE are geographically dispersed. Contact among communities, or between communities and the "outside world" is limited by the fact that the communicative infrastructure on the Reservation is extremely impoverished by Western standards Fewer than 30% of all Navajo households have telephones or electricity For those who do have telephones, the geographical isolation of most Reservation homes is such that most calls carry fairly steep long distance charges Thus, unsurprisingly, the greatest expenses associated with local resistance efforts are usually for telephone communications and travel The lack of infrastructure supporting the types of communicative or representational activities required by outsiders thus stands as a significant barrier to cooperation between local communities and outside sources of support

Because each local community faces unique environmental threats or civil rights problems, their particular needs vary One community, located on Black Mesa, faced the adverse effects of coal mining and the threat of forced relocation from their ancestral lands, which were the site of a border dispute between the Navajo and Hopi tribal governments Another community, the one at which Diné CARE started, resisted the installation of a toxic waste incinerator A third dealt with a proposed asbestos dump on one of the Navajo people's most sacred mountains While each of these issues was unique, some patterns have emerged in the cooperation such communities require to face these threats

Such patterns also emerged at the place where I conducted most of my research, a community at the foot of the Chuska Mountains, a small range which runs along the northern Arizona, New Mexico border The local people there organized in opposition to the Navajo Nation's Tribal sawmill, which had once been a "model" for Indian enterprise but which had outlived its usefulness. Local people considered the mill's annual harvest of the mountain's ponderosa pine forests to be excessive and destructive In spite of the fact that this was an "intratribal" dispute, and the fact that local people opposed the timber cutting based primarily on traditional Navajo beliefs (the Chuska Mountains represent the Navajo male deity, local people thus considered high volume timber cutting to be a form of desecration), these people were nonetheless required to secure the cooperation of non-Navajo technical, legal and financial support to conduct their resistance This included, for example, the need to master technical knowledge in their efforts, because "official" Tribal procedures and practices for the setting of forestry policy were mostly patterned after the

U S Forest Service, not traditional Navajo principles. It also included the need to know U S laws concerning forestry, environmental protection, and Indian sovereignty As one senior member of Diné CARE put it "Just as our ancestors, the great Navajo patriots of the past - Manuelito, Barboncito - had to learn how to use the white man's guns to defend our homeland, we have to learn how to use the white man's laws " Thus, even the most local efforts required intensive cooperation with outsiders who provided access to various types of resources

"Accountability"

Cooperation with non-Navajo organizations often required technologies of representation and discursive practices which local people found foreign, difficult to reproduce, or even inappropriate In this respect, much of the following discussion deals with issues involved in the production, manipulation and sharing of documents Documents as representational artifacts have received considerable attention in CSCW research, since they are the basis of so many work practices and since new technologies may affect both the physical substrate of documents and possibly some of the practices associated with them (e g , Brown & Duguid, 1994, Luff, Heath and Greatbatch, 1992) Analysis of Diné CARE's uses of technologies and their practices surrounding documents suggests some issues which may be characteristic of the use of technologies by groups outside the "mainstream"

First, note that the primary use of computers by Diné CARE members was not for *access* to information (which has been the primary issue in many discussions of paper versus electronic documents), but rather for the providing of information to outsiders according to the latter's demands One particularly clear example of this occurred in what Diné CARE's treasurer called "the funding game "

The "mechanisms of perception" of many organizations which fund environmental work are primarily limited to formal proposals Proposals, like application forms and other types of mundane bureaucratic documents constitute what Foucault (1977) has identified as a key instrument of power in modern Western societies - the "examination" This "tiny operational schema" links power and knowledge through a system of limitation the users of forms "engage in active cognitive work, but the parameters of that work have been established by the system that is organizing their perception" (Goodwin, 1994 609)

Groups unable or unwilling to accommodate a given system are more likely to remain "invisible" to the funders

In the funding game, the representational artifacts which allowed funders to distinguish among groups center (not surprisingly) on issues of financial accountability Budgets and financial statements thus constitute key artifacts in the proposal One entailment of this concern is the representation of the work of resistance in similarly quantified units - that is work as economic production This practice has a clearly identifiable history in Western society, especially in the industrial revolution and Taylorist management (Edwards, 1989, Epstein, 1978, Seltzer, 1992)) Yet because the representation of work in monetary terms has come to be so widely accepted in Western society, it seems to most of us to be a perfectly natural way of representing work

It is not a coincidence that Diné CARE's primary use of computers was for the formatting of documents, the completing of forms, and the manipulation of financial information which funders require These are all uses to which PC's have now been thoroughly applied in office settings throughout much of the industrialized world, their diffusion into such alternative settings as a sort of "first wave" of computing is perhaps not too surprising Deeper than this, however, is the relationship between the "examination" as a mechanism of knowledge and power and its ease and usefulness for automation In fact, the constraining of user input through form-filling has been an important feature in facilitating human-computer interaction historically, and remains a standard interface in many applications to this day Most important for this discussion, however, is how the examination as a mode of information entails relations of power by allowing some participants to establish what "counts" as information

How the Funding Game is Problematic

For the Navajo communities of resistance with whom I came in contact, the representation of their work in terms required by the funding system did not come so naturally as it does in mainstream society Many of the people involved in local resistance do not have extensive exposure to a cash economy (there are only a handful of banking centers on the entire Navajo reservation, and in fact many members of Diné CARE do not even have checking accounts) They are thus unfamiliar with the practices underlying the production of budgets, financial statements, or even expense reports and check registers As a result,

such people either lack the ability to complete formal proposals, or appear "unaccountable" Because virtually none of the local people who were involved with Diné CARE accepted monetary compensation for their work (all funds they raised were for direct operating expenses) they were marginalized as "volunteers" and many institutions had trouble dealing with communities where no "professional organizers" were present

More importantly, most of the people I encountered viewed their efforts as part of a long history of resistance to colonization by a foreign political and economic system The members of Diné CARE, like much of North American Indian resistance in general (cf Churchill, 1983), regard the capitalist system as not only destructive to the environment, but also as embodying practices and "ways of thinking" which undermine the social relationships and types of behavior which place humans in harmony with their social and natural ecologies Diné CARE's treasurer lamented that "By the time they (local communities) get it right, they're corrupted too " This exemplifies her awareness that, as Lave and Wenger (1990 55) point out, learning involves "embodying, albeit in transformed ways, the structural characteristics of communities of practice " Learning the funding game threatens corruption insofar as it entailed the embodiment of social relations characterized as "coordinated self interest" (Habermas, 1984), rather than traditional Navajo social motivations of duty to family and clan, and a sense of connectedness with - as opposed to mastery over - the natural environment

Because of their failure to share the discursive practices which funders or other resource providers require, Navajo communities often require the assistance of those who have mastered them This leaves them vulnerable in cooperative relationships Regional environmental or social justice groups based in nearby cities often take on the role of advocating "on behalf" of Navajo people, raising funds by publicizing local issues and representing themselves as accountable advocates for the local communities, while providing very little in actual assistance This happened on numerous occasions to the Chuska mountain community Outside environmental groups with whom they consulted raised thousands of dollars by publicizing their involvement with the Navajo forestry issue, very little of that money was ever applied to actually helping the local people A more egregious example of this occurred at the community on Black Mesa Because that issue was well publicized, urban activists raised over $3 million on behalf of local people between 1986 and 1992 At the end of that period, when no benefits had trickled down to the communities, these outside groups could only account for about ten percent of the

funds they had raised Thus, inequality of status, unequal access to resources, and exploitation in cooperative networks can be a direct result of differences in discursive practice among the respective participants

Authority in Discursive Practice

Diné CARE attempted to organize on a reservation-wide basis partly because of this pattern of exploitation The group recognized that mediation was necessary to connect many local communities with outside sources of support, but they sought to replace the mediation of non-Indian groups with that provided by a cooperative alliance of Navajo communities

Technology and practice presented considerable tensions for Diné CARE in this attempt to organize Because so few communities had access to the type of infrastructure necessary to support computers or fax machines, because local people did not have access to the types of technical support which have been shown to be necessary for using computers (cf George et al, 1989, Panko, 1988), and most importantly, because local people did not share the types of discursive practices involved in the production of documents, financial statements and other artifacts (which were by far the most common reasons for needing a computer), technology was of necessity concentrated in the hands of only a few members Those members who became responsible for applying technology were not only located in places where there was power and phone lines, but were also those who had had extensive experience off the reservation, dealing in the "white man's world" This centralized use of technology created a hierarchy in the organization, concentrating access to information, and power, in the hands of a few individuals who did not want it Diné CARE's treasurer accepted her role, and the unwanted power of arbitrating funds, only reluctantly, expressing it as a willingness to "corrupt herself" for the sake of other members

To get out of this predicament, the group was forced to establish more codified procedures for many tasks - including the distribution of funds, thereby shifting authority on certain tasks from particular individuals to artifacts created by the group as a whole While this alleviated the burden of decision making (for example, on the distribution of funds) it also forced Diné CARE towards a "bureaucratic" approach to operations which members strongly resisted This development was exacerbated by yet other, foreign

documentary practices, brought on by the need to represent Diné CARE as "accountable" to outsiders Practices in this regard included the production of such foreign artifacts as bylaws, articles of incorporation and mission statements Producing such documentation proved to be an extremely difficult task for members I watched as members struggled for over a year to come up with an adequate mission statement, lamenting that their sense of purpose could never be adequately expressed in a written, English paragraph These practices also ran counter to what members considered traditional Navajo patterns of cooperation, including an emphasis on local autonomy, decentralized authority, and trust built through human interaction The fact that technology use was right in the middle of this tension suggests that the democratization and decentralization which have been held up as goals in CSCW and PD may rely on degrees of formalization and documentary practices which are not necessarily universally shared.

The Authority of Documents

Various practices combine to establish the authority which documents carry in mediating social relationships in Euro-American settings Perhaps most important among these are signs of a document's "immutability" as evidence of the institutional power which it represents Brown & Duguid (1994) provide what might be considered a "native's ethnographic description" of the way in which documents embody authority that extends beyond their propositional content, and which outweighs spoken words in terms of binding relationships in Western societies

> the border, in particular the physical substrate of a communication and its various configurations, helps to embody, preserve, and represent authority Hence, the king's seal carried more weight than his words alone, a promissory note is more forceful than a verbal promise, a will can be proved but a wish cannot In all, a border distinguishes between mere words and deeds

The immutability of documents represents a physical manifestation of institutional power Their authority derives from signs which suggest that their production and appearance rely on forces which lie "outside" daily human interactions Immutability allows documents to appear on the scene of social interaction as not just a "given", but rather as transcending the ability of social actors to negotiate their meaning (cf Mitchell, 1990) Brown & Duguid point out that the switch to an electronic (and more mutable)

substrate may undermine the inherent authority of documents There is, however, a deeper issue which Diné CARE's experience highlights that is, the question of documentation as the basis of articulation work

Navajo people often explicitly reject the inherent, transcendent authority of documents This was starkly illustrated, I recall, on an occasion when a Navajo woman of the Big Mountain community in Northern Arizona received a court summons for herding her sheep on her own ancestral lands - which were politically disputed and thus subject to grazing prohibitions When asked what she was going to do about it, she replied "That piece of paper doesn't breathe It isn't alive Why should I do what it tells me " Although perfectly literate, this woman did not share the literacy-related practice which attributes institutional authority to documents themselves

For the people with whom I worked, authority relies instead on the situated practice of oral interaction Spoken words constitute the means by which relationships are established and maintained As Diné CARE's President once discussed with me

> We are an oral people For us our word is everything That's why we prefer to speak to each just right here (hands motioning in front of him) without anything written down, without contracts or legal-eze, even without notes or what have you In that particular manner we know that we are speaking from our hearts

On several occasions, not only Navajo people with whom I worked but also other American Indians in various settings, maintained a distinction between two ways of communicating, either "from the heart" or "on paper" Linguistic "performance" (in the particular sense defined in linguistic anthropology - cf Bauman and Briggs, 1990) - provides a basis both for authority and for the coordination of activities, through the building of what Diné CARE members called "trust"

This approach to the construction of authority is not simply a vestige of some vanishing "tribal" mode of existence Oral interaction plays a significant role in "modern" institutional settings as well The key difference between the Navajo approach and the Western approach to documentation is perhaps primarily a matter of emphasis Researchers have shown how orality can be embedded in - and integral to the continued operation of - numerous rationalized settings (e g , Suchman, 1983, Giddens, 1990, Cicourel, 1990) Documentation and codified procedures can be continuously circumvented and abrogated in Western society, but still often retain a critical sense of importance as an "objective" record which binds social participants to a prior interactional outcome For Navajo people,

articulation work hinges less on representational artifacts which transcend situational particulars, and depends more on interpersonal trust, continuously and repeatedly constructed in locally situated interaction

Conclusion

Discussions of hegemony in the social sciences often focus on how modern modalities of power reproduce the social order by forcing people to think in the terms which the dominant system lays down, thereby assuring its perpetuation even by those who oppose it This point of view probably underestimates the ability of social actors to finesse and negotiate meanings, and to deconstruct dominant discursive practices (Bauman and Briggs, 1990) In spite of all the troubles described above, Diné CARE members displayed far more creativity and ingenuity in assimilating and reframing technical discourses, documentary practices, and technology than most discussions of hegemony seem to acknowledge is possible Unfortunately, space does not permit a detailed discussion of the ways in which Diné CARE members managed various foreign practices, but a few examples may help to illustrate the point. With regards to funding, for instance, the visibility and outspokenness of Diné CARE's treasurer, as well as the prominence of the organization in the news during 1993 and 1994, allowed her to make extensive contact with potential funders She skillfully leveraged this exposure to encourage personal site visits by funders - thereby changing significantly the way many organizations approached the funding of local work Not surprisingly Diné CARE made enemies of many urban groups by attempting to knock them out of their (often lucrative) mediating positions during this time

Sometimes infrastructure problems were addressed through simple technological solutions, such as the acquisition of fairly inexpensive telephone equipment which allowed multiple voice messages at a single location, Diné CARE members without phones could at least be contacted by voice mail by outsiders who often had no idea about the infrastructure problems on the Reservation

In the production and manipulation of documents, or other text based communication, Diné CARE members displayed considerable differences from their non-Indian counterparts Some of these differences I offer only tentatively, as issues of familiarity with various technologies may have played some role Among these, Diné CARE members

displayed a significantly lower tendency to use faxed paper documents, or modem-transferred electronic documents as mutable, shared workspaces than the non-Indian associates with whom they worked Instead, Diné CARE members were far more likely to follow up on a transmission of a document with a personal phone call, in which their reactions to the text were discussed This may be partially explainable as an issue of familiarity with technology, as their likelihood of editing and retransmitting such documents did slightly increase over the course of a year However, even at the end of a year, a significant difference remained This seems evidence of the preference for oral interaction discussed above The tremendous phone bills which most members had each month seem to testify to this as well

In spite of this "interpretive flexibility" however, Diné CARE's experience suggests that relations of dominance may be reinforced purely because marginalized groups must adopt foreign discursive practices in order to make their voices heard at all Members of Diné CARE were fully conscious of how foreign practices were inappropriate for the framing and organization of their work, but they were nonetheless forced into adopting them to access support This presented them with a constant source of tension in their organization, which they regarded as always becoming either too hierarchic or too bureaucratic, not by the will of any of its members, but rather as the result of interactions mediated by technologies and representational artifacts that were imposed on them from outside

For designers interested in facilitating cooperation across increasingly heterogeneous networks of participants, or for the more general technological goals of "empowerment" and "democratization", such considerations may be of value. What may seem "natural" or "transparent" in "our" designs may embody practices which make technology a means of perpetuating relations of power rather than a force for liberation

Acknowledgments

This research was supported in part by a grant from the National Science Foundation (SBR-9300310) I would like to thank Jane Hill and three anonymous reviewers for comments on an earlier draft of this paper

References

Adler, P and T Winograd (1992) *Usability Turning technologies into tools* Oxford Oxford University Press

Anderson, R J (1994) "Representations and requirements The value of ethnography in system design " *Human-Computer Interaction* 9 151-182

Bauman, R and C Briggs (1990) "Poetics and performance as critical perspectives on language and social life " *Annual Review of Anthropology* 19 59-88

Brown, J S and P Duguid (1994) "Borderline issues Social and material aspects of design " *Human-Computer Interaction* 9 3-36

Churchill, W , ed (1983) *Marxism and Native Americans.* Boston South End Press.

Cicourel, A (1990) "The integration of distributed knowledge in collaborative medical diagnosis " In *Intellectual teamwork Social and technological foundations of cooperative work,* ed Jolene Galegher, Robert Kraut, and Carmen Egido Hillsdale, NJ Erlbaum Pp 221-242

Clement, A (1990) "Cooperative support for computer work A social perspective on the empowering of end users " *Proceedings of the 2nd conference on CSCW, October 7-10, Los Angeles, CA* New York ACM

Edwards, J.R (1989) *A history of financial accounting* New York Routledge

Epstein, M J (1978) *The effect of scientific management on the development of the standard cost system* New York Arno Press

Foucault, M (1973) *The Archaeology of knowledge* New York Pantheon Books

Foucault, M (1977) *Discipline and punish The birth of the prison* New York Pantheon

George, J , R Kling and S Iacono (1989) "The role of training and support in desktop computing " *PPRO*, UC Irvine, 1989

Giddens, A (1990) *The Consequences of Modernity* Palo Alto, CA Stanford University Press

Goodwin, C (1994) "Professional vision " *American Anthropologist* 96(3) 606-633

Gramsci, A (1992) *Prison Notebooks* New York Col umbia University Press

Greenbaum, J (1993) "A desıgn of one's own Towards partıcıpatory desıgn ın the Unıted States " In Schuler, Douglas and Akı Namıoka (eds) pp 75-103

Habermas, J (1984) *A Theory of Communıcatıve Actıon* Boston Beacon Press

Hutchıns, E. (1995) *Cognıtıon ın the wıld* Cambrıdge, MA MIT

Hymes, D (1974 (1964)) "Toward ethnographıes of communıcatıon " In Dell H Hymes (ed) *Foundatıons of socıolınguıstıcs* Phıladelphıa Unıversıty of Pennsylvanıa Press

Klıng, R (1980) Socıal analyses of computıng Theoretıcal perspectıves ın recent empırıcal research *Computıng surveys* 12(1) 61-110

LaDuke, W (1983) "From the natural to the synthetıc and back agaın " In Churchıll, (ed) pp ıv-xxııı

Lave, J and E Wenger (1990) *Sıtuated learning Legıtimate peripheral partıcipatıon* New York Cambrıdge Unıversıty Press

Luff, P , C Heath and D Greatbatch (1992) "Tasks-ın-interactıon paper and screen based documentatıon ın collaboratıve actıvıty " *CSCW '92 Proceedıngs, Toronto, October 31 to November 4, 1992* New York ACM

Mıtchell, T (1990) "Everyday metaphors of power " *Theory and Socıety* 19 545-577

Norman, D and S Draper (1986) *User centered system desıgn New perspectıves ın human-computer ınteractıon* Hıllsdale, NJ Erlbaum.

Panko, R (1988) *End user computıng· Management, applıcatıons and technology* New York Wıley

Phılıps, S U (1983) *The ınvısıble culture* New York· Longman

Schmıdt, K and L Bannon (1992) "Taking CSCW serıously supportıng artıculatıon work " *CSCW* 1(1) 7-40

Schuler, D and A Namıoka, eds (1993) *Partıcıpatory desıgn· Prıncıples and practıces* Hıllsdale, NJ Erlbaum

Scollon, R and S Scollon (1981) *Narratıve, lıteracy and face ın ınterethnıc communıcatıon* Austın University of Texas Press

Seltzer, M (1992) *Bodies and Machines* New York Routledge

Suchman, L (1983) "Office procedures as practical action Models of work and system design " *ACM Transactions on Office Information Systems* 1(4) 320-328

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