

General Examination on Context Area:

Understanding Socio-Cultural Behavior in Public/Private Spaces

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1. Briefly (max 1.5 pages), describe the physical layout and its interaction with the social organization and social dynamics of the Garden.
2. According to the shared media workspace literature, as well as Whyte and Goffman, what are likely outcomes of the introduction of a shared media space into any physical space? The section should consist of a review of the literature; your points should be heavily grounded in the literature.
3. Briefly (1/2 page), based on the above literature review, speculate on what the likely effects would be from introducing a media workspaces, as one from Media Lab Europe, into the Garden.

1. *Interaction of the physical layout of the Garden workspace with its social organization and social dynamics*

The *Garden Workspace* at the MIT Media Lab has a unique social and physical character that allows its occupants to maintain an evolving pattern of co-existence.

Social Organization

Though the Garden is formally constituted of different functional workgroups of students organized under faculty, the everyday social order within the space emphasizes mutual relationships and negotiated co-existence. Most faculty do not keep offices in the Garden, and those that do maintain a low profile. The social organization though somewhat flat is to some extent centered around the (expressive) graduate students and their UROPs who *initially* hangout in work-related clusters. However this is a superficial organization as one notices over time specific roles and an evolving social order. There is Dean, the 'communication hub' or *mayor* as Whyte refers to it [Whyte88]. He usually acts as the nerve center of the space, staying aware of people and their activities and any departure from the norm. People check with him throughout the day, leaving messages for others or asking questions. Dean tends to accumulate a great deal of local knowledge of the occupants and anticipates people's questions. Then there is Jacky, the unofficial 'sys-admin' who monitors people's usage of valuable disk-space and network resources; maintaining a dominant role that people become keenly aware of. Stefan is the 'housekeeper' who takes ownership of the Garden's physical layout by his constant desire to rearrange and maintain the space, and ties the community together by his efforts to arrange movie showings and such. There are several other less prominent roles, which tend to evolve over time. There are often known visitors, 'outsiders' and lurkers within the space that together maintain (and occasionally disrupt) the ebb and flow of the Garden's social ecology.



Physical Layout and Social Dynamics

The Garden workspace has historically consisted of functional areas such as the workstation clusters, meeting room, TV area, and surrounding offices. However, the Garden was renovated in summer'99, opening up the prior enclosed space into the hallway. The meeting room is visually accessible to both the workspace and the hallway through its glass-wall. The front of the space has acquired a role of a shared place for entertainment and demonstrations, while the center space revolves around clusters of workstations. The back area contains a hardware space and embroidery machines, partially enclosed by partitions above eye-level. A passageway wraps around the entire garden workspace connecting it to private offices.

The renovated space has changed the relationship of the Garden to the "street", as Whyte would put it, by making the space more accessible to pedestrians walking through the hallway. The newly opened-up space and the glass-walls of the conference room allow one to comprehend the whole space in a single visual sweep. The hallway also serves as a transitional space of "indecision" allowing a visitor to walk-by and glance without having to step into the workspace. Whyte points out the role of such spaces of indecision in successful design of plazas and store fronts, permitting the potential customer "half-way steps" as they comfortably view the activity from the periphery. People often stop and talk in the hallway, staying right in the way of pedestrian traffic, allowing themselves an easy point of departure to continue their trajectory.

At any moment in time, one finds that the Garden is not evenly occupied, but rather sees regular and changing social centers of activity where people gravitate. A primary hub is the workstation cluster, closest to the TV. It contains four workstations that are all usually filled up first by incoming people at any time of day. One reason is that such social grouping provides a natural support to people working on related problems. However, Whyte would claim that there is also a purely social effect of people gravitating towards crowded centers of activity, rather than distributing themselves evenly thorough-out a space. This can be explained through the process

of "social facilitation" i.e. people using other's visible activities in framing their own goals, motivations and actions [Ackerman95]. Another social hub tends to be the main workstation in the center of the space, usually occupied by the one person such as Dean or Jacky, and providing communication to support the rest. Many visitors and occupants frequently stand around this central hub, in conversation, to ask questions or simply to control the AV setup. However these spaces are clearly known to "belong" to certain people or roles. It is implicitly considered inappropriate for others incidentally found in such 'owned' spaces. As the space fills up, some people begin moving to less visible areas in the back, but most move in closer physical proximity to others; the social distances contract as "crowding makes crowding more tolerable" [Whyte88] and denser spaces are occupied more. One finds that people tend to pass through the main social hubs in the garden while walking to their offices or leaving, despite other unobtrusive paths. Whyte notices similar behavior with people walking through crowded areas in plazas.

The entertainment complex centered around the high-definition TV, tends to become a social hub at certain times of day, based on scheduled television programming or simply as a informal meeting space. The use of the TV "marks out the ownership" of the space by certain occupants at certain times of day [O'Brien99]. The media spaces often extend into the workspaces, when active or loud, causing tension and a need for negotiated order. An interesting note on the evolving design of this space concerns the placement of couches around the TV. In the past, three couches enclosed the space in a rectangular manner; a new arrangement of two couches pivoted to each other changes the social dynamics somewhat. The triangular space is now more accessible yet intimate, permitting people to face away from the hallway; giving some an incentive to use a couch to sleep on, being less easily noticed by visitors walking in the hallway.

The space between the conference room and HDTV is largely treated as an experimental area for installations and technologies. The students tend to take greater shared ownership of the area, rearranging it and changing its contents regularly. A large car-frame previously disposed in that space by faculty was rapidly adapted into a lounge area by the students. The current space has been transformed into a media space by a large projection screen with several live video streams (and a couch facing it). Curiously, it no longer functions as a social area, as people probably feel compelled to be "in a demo" or observed by the wide-angle cameras placed there. However the placement of the couch has created an accidental social space right behind it. This 'emergent corner' between the couch, meeting room and hardware lab, is a comfortable distance from the camera, yet serves as a transitional space for standing conversations among people, entering or leaving the garden; what Whyte would consider a "100% location".

While the 'front region' serves as a shared and open social space in view of the public, the 'back region' consisting of the office pathway and hardware workspace is more private. The walkway adjoining offices is usually not traversed by visitors unless looking for specific people. One also finds many students lingering by the office doors in this pathway, in more personal or private conversations. The hardware lab partitioned above eye-level and the hum of the embroidery machines makes it both a less inviting space as well as a private work area inhabited by only a few on 'backstage' hardware jobs. Whyte claims that sight lines are important for making a space more inviting. However often this space conversely becomes a place for more discreet conversations. In some cases people extend their "backstage style" [Goffman61] to the shared areas around.

Overall a sense of *shared living and work* are distributed throughout the Garden workspace [O'Brien99]; it is not clear when one steps into or out of the other. The physical layout along with expected temporal activities throughout the day structure the social character of the environment. Although technological artifacts interleave and influence the social space, the TV and media spaces also disappear into the background when not in use. The constant rearrangement of the garden allows its occupants to stamp their character onto the space. The demands of multiple inhabitants in the Garden overload the affordances of the workspace, yet a balance is implicitly coordinated and negotiated within its evolving social order.

2. Outcomes of the introduction of a shared media space into any space

When we think of 'shared media spaces', we can broadly characterize them in a range from everyday broadcast devices such as radio/TVs in the home, to open-channel audio connections (including low-quality 2-way radios), desktop shared video and finally distributed & responsive audio/video interaction spaces. These distinct types of media spaces provide different perspectives for analysis, along with common issues regarding their outcomes in shared domestic settings and workspaces. Much of the prior literature in media spaces considers the influences of mediated communication between the individuals directly involved in face-to-face video communication or synchronous voice conversations. Much less is generally known about the (long-term) impact of media spaces beyond the immediate context, to the surrounding physical environment and among proximate individuals not directly engaged in the process. A recent paper by Dourish et al [1996] considers the role of *video* as part of the real-world and how people organize everyday activities around it. They propose a framework whereby video-mediated communication is analyzed via *individual*, *interactional*, *communal* and *societal* perspectives. They state that typically at any given moment, elements of each are present simultaneously, with mutual influence. We'll consider the following encompassing themes regarding the influence of media spaces:

Notions of Social Space and Place in Continuous Media Spaces

Media spaces comprise not simply a communication modality or interaction facility like 'desktop videoconferencing'; but rather define *social spaces* and create new *places* where certain kinds of social interaction emerge. Dourish et al mention the use of open audio/video connections in their offices as creating long-term *social spaces*, evidenced by the desire of colleagues to step into their office to meet not with the local occupants, but with the remote participants [Dourish96]. There are several examples of how sustained use of continuous audio has created social spaces [Ackerman97][Watts96], even with low-bandwidth asynchronous audio via 2-way radios [Orr93][Strub97]. The audio channel allows participants to engage in short and lightweight interactions, where the initiation of conversation between participants does not require much (or any) overhead relative to the actual transaction. This attribute of a continuous-on media connection helps establish a sense of informal social space. The projected audio in a media space "opens up the space", extending the connection beyond the individuals directly involved. Others can comfortably lurk in the periphery and enter a conversation only if desired, not unlike a transitional space between a store and the street that allows such peripheral monitoring and social indecision [Whyte88]. In media spaces participants gradually "move from an initial understanding of linked individuals to one of linked spaces" [Dourish96]. The importance of a notion of "place" has been emphasized by Harrison [1992] for contextualizing commonly understood patterns of acceptable behavior, over time. This transformation of "space" to "place" is illustrated by emerging patterns of behavior and adaptation among media space participants and their physical neighbors.

Peripheral Awareness and Interruption

Dourish and Bellotti define *awareness* as the "understanding of the activity of others, which provides a context for your own activity" [Dourish92]. Based on their experiments with the PARC/Portland Link, Sara Bly et al [1993] state that although peripheral awareness seems invisible, its implications for use of media spaces is considered most powerful. Visual glances of people walking around or sounds from either side provided clues of on-going activities, who was around and encourages spontaneous encounters. In their studies of London Underground control rooms, Heath and Luff [1992] discuss how peripheral monitoring and public disclosure of 'private' activities enable fine-grained interaction and coordination. A similar finding comes from flight controllers constantly monitoring for deviations (from known patterns) in multiple audio channels in space shuttle mission control [Watts96]. In both these environments, awareness in audio channels allowed controllers to synchronize their own activities by being able to track the tempo of the mission processes and activities generated by the "cascade of disturbances" that occurred. Such a passive awareness mechanism sometimes called preattentive reference [Woods95], allows controllers to shift their attention dynamically and opportunistically in response to changing

situations, while maintaining a focus on their immediate tasks and goals. This form of monitoring or peripheral awareness requires low task overhead and attentive focus, while permitting distribution of cognitive abilities across a team and efficient coordination of activities. However the same level of awareness in an unconstrained manner also frequently leads to *interruption* as irrelevant conversations, uncontrolled or unintended acts (sneezing) [Ackerman97] and background sounds are constantly or unexpectedly heard by remote participants. The sounds of someone typing on a remote connection can easily be confused with those coming from a nearby colleague. In many cases the lack of context from everyday background sounds leads to noise pollution, although it does convey a sense of activity on the other end [Dourish96]. The outcome is that participants have to actively ignore such interruptions, requiring greater cognitive overhead to maintain inattention or devise new norms to minimize their impact; this trades-off some of the potential benefits of awareness in the first place.

Ownership of Media Technology and Space

As a pattern of regular behavior develops between participants around continuous media connections, they become concerned with joint ownership and responsibility of the connection itself. However such ownership is difficult to assume in a situation where several public spaces are connected. In the "Portland Link" mentioned by Olsen and Bly [1991] distributed communities were engaged and claimed ownership in public spaces due to common interests and working relationships. However in BellCore's VideoWindow [Fish1990], without an explicit focus between the workgroups, there was less evidence of enthusiasm and ownership. In the PARC/Portland link participants adopted the easily *accessible* technology (cameras on tripods), moving it around in their physical space to suit their purpose. The nature of open audio/video connections makes the space occupied by participants implicitly shared; hence the issue of ownership of the space becomes complex. E.g. Remote participants would be required to acknowledge local individuals visiting a connected colleague's office, hence sharing the space and its social responsibilities. Dourish noted a case of a researcher (Bellotti) that reorganized her office to support "better mutual orientation" so that her remote colleague would have a better view of her office and the periphery of the public space. Hence there is a gradual exchange of mutual ownership in media spaces that influences social protocol and physical layout of the connected spaces.

Routines and Ownership of Media Spaces in Domestic Life

Let's consider the introduction of media technology in household settings; there has been a dearth of research in this area until recent ethnographic studies by Hughes and O'Brien on the evaluation of set top boxes for digital services to the home [O'Brien99]. The social organization of household routines clearly affect and are influenced by the introduction of media technology. In a number of homes visited by the investigators, they found that the content and scheduling of TV and radio was often used by family members to mark their *time* and *ownership of spaces* within the home. The everyday routine activities were found to be closely interwoven with (and even constructed by) the usage of media technology; individual usage was recognized as their access priority by other members of the household. Interestingly, the role of good parent was articulated by their careful control to certain media technologies. The investigators noticed an attribution of certain "status" to technological artifacts within the social organization of the household; e.g. television was considered "antisocial" when guests were received such that furniture was arranged away from the TV (towards home stereo), and placed back later. Overall the interaction with media technology in domestic environments is socially managed in complex ways and closely linked with relationships, routines and values within the home.

Unintentional Invasions of Privacy

Privacy issues are multi-dimensional and are greatly affected by the organizational culture and context where the media spaces are used. Gaver [1992] identifies four issues related to privacy: 1. Having *control* over who can see or hear a participant at any time; 2. To have prior *knowledge* when in fact they are observed; 3. Knowing the *intention* of the connection; and 4. Avoid *intrusions* that disturb their work. There is a trade-off between the level of privacy demanded and quality of awareness one can expect in a media space [Mackay99]. A desire for control, knowledge and lack of intrusion conflicts with the benefit of having spontaneous awareness and

the lightweight overhead required to maintain such awareness, such as not having to acknowledge or ask every request for communication. However despite having knowledge and control, in a continuous media system it is easy to forget that a camera or microphone is on, leading to potentially embarrassing moments. This is true in both visual and audio spaces, but is particularly characteristic in audio, as there are fewer explicit cues to prevent such situations. Ackerman et al [1997] often noticed unwanted disclosures of personal information, accidentally leaked into a shared audio space. This would usually happen unintentionally as users forgot to turn off microphones when answering the phone or responding to a visitor in their office. Conversely, avoiding other's disclosures was hard to control as all information was broadcast to everyone connected in the audio media space. Hence the sense of shared space provided by broadcast audio also made managing the disclosures difficult, particularly as there were few cues to distinguish whether the disclosures were accidental or intended. Ackerman also points out that people carefully manage their "face", embodying both given and given-off expressions, to others in everyday life; this is related to Goffman's notion of "audience segregation", whereby people present a different face to different audiences [Goffman61]. However in social interaction in a media space as we have seen, people have less control over their "face" and any accidental or unintended communication of private information or personal habits can be disconcerting and in some cases potentially harmful in organizational settings [Ackerman97]. This leads to an evolution of norms and practices as discussed below.

Formation of Norms and Coevolution of Practices

Despite the limitations and issues in media spaces mentioned above, people were quite adept in restructuring or devising new social practices or norms to suit extended use in their everyday environments. Both Dourish [1996] and Ackerman [1997] point to evolving communication practices arising as participants get familiar with the affordances of the particular medium. People gradually adapt new behaviors or social protocols to deal with the intrusions, privacy issues, and awkwardness related to continuous-on audio/video connections. E.g. dealing with the confusion of eye contact and gaze awareness for face-to-face communication and disembodied voices arising frequently out of view of the media space. In any media space, the participants develop shared understandings of how to behave while using such a system. The norms for behaviors having significance to the group are negotiated over time, based on people's experiences and the affordances of the media space. Meier [1990] gives a definition of norms as "group-supported definitions of expected behaviors in specific situations", as mentioned in [Ackerman97]. In Thunderwire, the majority of norms were associated with the side-effects of being in a shared audio-only social space, such as knowing when people were present or listening, reducing violations of privacy and dealing with noise [Ackerman97]. Examples of such norms cited such as having an awareness of who's in the space, required explicit singing-on/off via vocal greetings and letting people know who else is in the space. This was also noticed from audible clicks of microphones, which started to serve as a resource for group use. A curious set of practices evolved around the use of phones. Although in a shared public settings people often take phone calls, in a shared audio space this was initially considered disruptive and privacy invading. However excusing oneself each time for phone calls would be considered rude or suspicious by some. Hence norms formed in Thunderwire showed people intentionally not disconnecting for short calls, however failure to disconnect for longer calls continued to cause privacy problems.

Dourish et al [1996] mention the evolution of a set of behaviors at different levels: orientation towards the technology in media spaces, communicative practices to support 2-way conversations, and understanding the ways in which media spaces "disrupt the communal resource of space". They cite examples of such evolution in behaviors related to eye contact and gaze awareness. These behaviors went through 3 distinct phases: from initial confusion, through simulated eye contact to finally the use of gaze awareness. They also show how "place orientations" emerge out of the exploratory use of the spaces occupied by participants using media spaces, such as Bellotti's re-orientation of her office space to accommodate better views of public areas and third persons. Dykstra-Erickson et al [1995] document the emergence (over a relatively short period of 10 weeks) of a "local visual language" - patterns of stylized gestures developed by participants in a media space. The use of a "highly coded language" was also

noted by researchers studying use of voice loops monitored by flight controllers [Watts96]. To enable better communication implicit protocols that used abbreviations and acronyms evolved, which provided lots of information yet, took up less bandwidth in an audio-only channel. Dourish points out that as the participants gain familiarity with the technology and their use of the media spaces increases, so does the range of activities that they can effectively perform in such spaces. These evolving and creative uses and adaptations are intrinsic to the medium and only found through long-term observations. Ackerman shows that the construction of new practices and their maintenance would not be successful unless the participants actively inhabit a perceived social space, and use it continuously for meaningful social interchange, as evidenced in Thunderwire and in the experiences at PARC.

3. *Speculate effects from introducing a media workspace, as one from Media Lab Europe, into the Garden*

A distributed media space creates a *distinct social place* in the Garden rather than simply a face-to-face interface between the participants on different sites. In the current 'iCom' prototype link with the Cube, one notices people cluster in this social center at different times of day, mostly based on spontaneous presence and shared events in some cases. In their experiments with the PARC/Portland link, Sara Bly et al [1993] and Dourish et al [1996] mention how local and remote participants begin to treat the media link as a *place* for certain kinds of social interactions. In iCom, multiple views and shared content streams reinforce the notion of a newly created "place" where people "hang out" at certain times of day. People on both sides gradually recognize each other's routines and daily rhythms, anticipating activity and even marking out shared ownership at certain times of day. Here new roles and norms of behavior emerge, which are different from face-to-face interaction. Dourish [1996] and Ackerman [1997] point to evolving norms and practices to deal with the awkwardness of the media and privacy issues. In iCom, the presence of a camera facing the couch prevents people from casually sitting there, so as not to feel compelled to present a particular "face". The cameras also shows a view of the hardware area and the HDTV couches; this transforms the "back-region" into "front" by making all its "backstage style" activities [Goffman65] of soldering circuits or lounging next to the TV, publicly in view. Hence people in the background begin to position themselves out of view to avoid expressing an undesirable or unintended face to remote participants. Despite the pre-designated camera setup created initially, participants on both ends often adjust the camera views and arrangement of the spaces to gradually support better "mutual orientation" and maintain recognized privacy norms, as seen in the PARC link by Dourish and Bellotti [1996]. However, unintended visual disclosures such as potentially embarrassing bodily gestures or utterances continue to occur in the background, by people not aware of their presence in the iCom media space (as noted by Goffman and Ackerman in their studies). Hence in the current system, people generally move the camera to face a humorous image or stuffed toy. This protocol has begun to emerge as an acceptable and polite means for implicitly dealing with privacy concerns and for people not desiring interaction (without entirely turning off the camera) while still retaining some ambient awareness of the visual scene around. Due to the large size of the display, participants also frequently minimize video windows showing a coarse but seemingly more acceptable view of the spaces. During interaction, it is often observed that participants don't always use the face-to-face views, preferring instead to point to objects or secondary views, as noted by Dourish et al [1996]. In the current media space between the Garden and Cube, the main participants are generally known to each other and share a prior social context. This establishes a basis for their expressive casual behavior and lack of formal greeting protocols across the link (as seen in Thunderwire), however in a Dublin link that assumption may not hold necessitating additional norms between new participants. The pre-existing social roles in the Garden (as mentioned in Whyte's work) such as the 'communication hub' and 'housekeeper' continue to be retained and even emphasized in this new space. However despite the rich bandwidth of the media link, the nature of interactions between participants remains brief, casual and playful. Most of the media space usage is directed towards supporting a closer familiarity, awareness and chance encounters rather than focused work or discussions, as noted by Bly et al [1993] in the PARC/Portland link.

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