

# **Communication Patterns in Domestic Life: Preliminary Ethnographic Study**

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## **Introduction**

Despite a range of communication technologies available today, we feel that families have difficulties managing everyday communication and subsequently the relationships with members that are temporally or spatially distributed. There is a dearth of research in Human-Computer Interaction (HCI) to understand domestic communication patterns and conduct socially informed design in such settings. The literature in social anthropology informs us about the complex notions of family and household and patterns of domestic interaction. We need ethnographic methods for conducting social research related to communication patterns in such settings. Ethnographic approaches allow us to observe and interview people in their naturalistic settings to discover their personal experience, social attitudes and relations [Lofland84].

In the Speech Interface Group at the MIT Media Lab, our interest is in deploying expressive communication and awareness technologies in the workplace and domestic settings [Sawhney2000]. A hypothesis is that providing some form of continuous-on and asynchronous connectivity within a meaningful social & physical context can foster better relationships and awareness among distributed family members. To gain a better understanding of these issues, we conducted a short five-week pilot ethnographic study consisting of questionnaires and interviews with 20 participants from immigrant families in the local Cambridge community. The goal of this pilot study was to gain an understanding of communication patterns in distributed domestic relationships and within the extended social and community network. The participants were approached through personal contacts and local community centers and interviews were audio-taped for subsequent transcription and analysis. In this paper we discuss the motivation, related work, ethnographic methods and some preliminary analysis of the data from the study.

## **Domestic Communication and Awareness**

Despite the general dearth of research in HCI in the domestic domain, there are a few recent examples of projects and studies. The Presence project [Gaver99] used cultural probes to consider design for communication in elderly communities. British Telecom has done a number of larger-scale field experiments that consider the role of monitoring [Barnes98] and communication devices in homes (no studies made publicly available yet). Recent projects have undertaken the design of smart homes as test-beds for new technologies, such as the Aware-Home at Georgia Tech [Kidd, Mynatt et al 1999] and the House\_n project at MIT [Intille et al 2000]. However, it is clear that a smart home does not necessarily support the cognitive demands and social relationships critical in domestic life.

Let's consider the introduction of media technology in household settings; A recent ethnographic evaluation of set-top box trials for digital services to the home by O'Brien and Hughes [1999] provides some reflection on the nature of domestic activities and their implications for design. 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.

Trends indicate that personal mobile devices will be far more ubiquitous as wireless services become more affordable, and an array of richer information services on these devices become available. GSM phones in Europe and I-mode phones in Japan already point towards the usage of many wireless, location-dependent and 'continuous-on' services. In addition, use of VoIP (voice over IP) via Internet devices and local phones is greatly expanding as the quality and accessibility of the services improves. Such devices and services could begin to incorporate sensing and processing to make perceptual mechanisms feasible. Despite my own personal proclaimed aversion to mobile-phones (and pagers/PDAs), one can recognize (from the limited field studies) that in conjunction with other methods mobile devices are beginning to serve as an important communication link in domestic life (it is clearly useful in business, but that's not our concern in this paper). However, to understand and enhance domestic communication and awareness, we must consider how people maintain social relationships in home and work life, and the role of technology in these settings. There is not much evidence of *published* ethnographic studies on mobile domestic communication patterns. Although companies like BT, Motorola, Intel and Telenor claim to have done studies, no results are publicly available to my knowledge.

Dourish and Bellotti define [social] *awareness* as the "understanding of the activity of others, which provides a context for your own activity" [Dourish92]. The implicit purpose of this phenomenon is closely related to the process of "social facilitation" i.e. people using other's visible activities in framing their own goals, motivations and actions [Ackerman95].

*The key issue is: How does one provide appropriate forms of awareness and interruption mechanisms that support a variety of practices and social behaviors in different contexts (home, work and commuting)?*

### **Understanding Domestic Relationships: Related Work in Social Anthropology**

There is much to be gained by closely examining the literature in sociology and social anthropology in regards to domestic life and communication patterns within the family. We look primarily towards social anthropology rather than studies in communication psychology as we are more concerned with human interaction with other individuals (through devices in some cases), rather their conceptions of self and interactions with the devices themselves.

#### *Defining the Social Unit of Inquiry*

Many anthropologists make a distinction between family and household along the lines of kinship (i.e. related genealogy) and geographical propinquity or common residence, respectively [Yanagisako79]. In many societies families do not necessarily form households and vice versa. There is an attempt to avoid a functionalist definition of the family, as many functions construed as "family functions" are sometimes fulfilled by groups living together (or in the community) but not related by kinship [Bender67]. It is suggested that the family be defined in purely "structural" terms related to kinship. Goodenough identifies the mother-child unit as the nucleus of all family-groups [Goodenough70], however this is problematic as it assumes the vital function of the family is in procreation and child-rearing. There is also a difficulty in defining the boundaries of households, especially as there is greater mobility in the household with a seasonal cycle of dispersal and concentration. Anthropologists suggest terms like 'domestic group' or 'coresidential group' rather than households, focusing on reciprocal interactions between individuals in the

group [Bender67]. These terms are only useful for ethnographers as far as they require one to be explicit about the exact nature of the social unit one wishes to analyze. One must recognize that these units cannot be easily categorized and reduced to some universal definition. Meanings pertaining to kinship relations can be derived from observable actions and verbal statements of individuals. Categories such as family and household and relatives encompass a range of different meanings based on the cultural/political context and different phases of their history [Schneider64]. There is an acknowledgement that the units labeled as families are as much a part of the political and economic structure of the society as it is a reproductive unit. There is nothing wrong with a functional analysis of families as long as we don't assume a priori that the "diverse array of social units we call families fulfill the same set of functions or their primary function is always the same". Hence these categorical units represent "inherently complex, multifunctional institutions imbued with a diverse array of cultural principles and meanings" [Yanagisko79]. We are more interested in the network of interactions and *relationships* within the family and outside (the nature of relationships may be more nearly universal [Bender71]) rather than defining categories of the family or household. We hypothesize that perhaps there may be communication hubs in such a family network, a "knot" that historically links the different social units, and hence may serve as resourceful and 'key informants' about patterns of interaction.

#### *Understanding Patterns of Domestic Interaction*

Anthropologists see family interactions as an indicator of how families organize themselves to perform activities that give them the characteristic of being enduring groups [Aldous77]. As structural supports to families seem to be weakening, the persistence of family units depends upon the solidarity of relationships within the group. Examining these relationships can center on either *process* or *outcomes*. There has been a steady shift in interest from correlates of interaction outcomes to delineating the processes. The process perspective is more useful for us as it takes into account the distributive aspects of family interaction i.e. who initiates actions, individuals involved, proportionate amount each members act constitute towards the interaction. The variables cited as affecting the process include *complexity*, *conflict* and *reciprocity* in the interaction. It is found that some couples "even appear to organize their marriages around conflictual interaction" [Cuber65], and despite disagreements continue to stay together. It is suggested that researchers have to go beyond the interaction units of action and response to determine how conflicts escalate and die down. Raush suggests use of Markov chain models to determine probabilities of certain behaviors followed by others, perhaps showing a phase pattern and turning points in disagreements [Raush72]. Interaction sequence analysis can potentially help understand some aspects in processes of communication over time.

Family communication can be broadly concerned with behavior such as exchange, power (influencing behavior, exchanging resources), task assignment, and expression of affection or disapproval [Aldous77] as well as non-directed given-off impressions [Goffman61]. An important concern is how does one evaluate impact or benefit of such communication processes. It is clear that the quantity of transactions is not as important as the quality of the interaction. On a related note, it must be observed that all communication cannot be considered beneficial. Undesirable communication can be disruptive. Moreover there is some evidence that communication openness can even exacerbate marital disagreement, especially when it reveals irreconcilable differences [Aldous77]. Restricted communication in working-class families is cited as an outcome of the number of problems they face; no amount of problem solving ability can increase the few alternatives available [Straus68]. Results from a small study suggest that television watching served as a device for families to avoid interaction in tense situations when spatial separation was not possible.

Overall this again points to the fact that even in conflict resolution the quality of communication rather than quantity seems to be important. This notion of 'quality' has been attributed to dimensions such as "families' problem-solving effectiveness, their coordination of individual solutions, and their ability to delay solution closure." [Reiss71]. An important dimension pointed out by Neidhart considers "system transparency" in family interaction [Neidhart76]. This reflects one's knowledge of other's needs and satisfactions; a form of social awareness leading to

reciprocity in behavior. There is a need to examine the role of extra-familial social network in relation to the interactions within the family. It is speculated that conjugal task sharing, external network and shared social contacts outside serve as alternatives for household help, emotional support and is attributed to generally positive attitudes [Nelson66]. Overall though, there seems to be a lack of research on the external influences on family interaction patterns; in studies it is usually assumed that conditions outside the family are relatively constant.

### **Communication Patterns in Domestic Life: Pilot Ethnographic Study**

In the Speech Interface Group, our interest is in deploying expressive communication and awareness technologies in both the workplace and domestic setting. A hypothesis is that providing some form of continuous-on and asynchronous connectivity within a meaningful social and physical context can foster better relationships and awareness among distributed family members. Existing technologies like phones already provide synchronous voice communication and to some extent asynchronous messaging. However it is not clear how these modalities are used in maintaining such relationships. A key concern for us is not to focus only on the pattern of communication within a co-residential social unit, but that with distant members and within the extra-familial network.

To examine the role of communication technology in maintaining domestic relationships, a short six-week pilot ethnographic study was undertaken in summer '2000. The study was designed and conducted by the author and a social anthropologist, Herve Gomez from the Dept. of Ethnology and Comparative Sociology, University of Paris X Nanterre, France. The study was approved by the COUHES committee for human subjects at MIT in July. The goal of this pilot study was to gain an understanding of communication patterns in distributed domestic relationships and within the extended social and community network. The fieldwork consisted of interviews with 18-20 informants from immigrant families in the local Cambridge and Boston area. A team of 2-5 investigators including the author, conducted the fieldwork in July-August, 2000. The informants were approached through personal contacts and local community centers. All interviews were audiotaped for subsequent transcription and analysis.

#### *A Note on Methodology*

It is important recognize the qualitative nature of a such ethnographic studies. The goal of the study was to better understand people's interpretation of their social patterns and conception of the role of communication in their relationships. The study did not attempt to collect quantitative data from a statistically representative sample of the population. But we feel that even with small set of interviews across informants with different backgrounds, gender, ethnicity and social status, an ethnographic study can provide an understanding of broader patterns in society. Generally, such fieldwork requires participant observation, however the short time-frame and nature of the study required the use of intensive but unstructured interviews with all informants (usually lasting an hour or so each). In the intensive interview the emphasis is on obtaining narratives or accounts in the person's own terms. The interview guide serves as a primary reference, but the investigator is free to change topics based on the responses heard. A series of *probes* (often connected to a specific question) may be asked to engage the participant to discuss issues not mentioned or only slightly disclosed earlier. E.g. "You have mentioned that... Why? What does it mean for you?". Overall we must recognize that such a social inquiry in the field requires flexibility on the part of the investigators to refine goals, methods and tasks, based on the emerging characteristics of the people and environments studied.

#### *Preliminary Analysis: Case Study of Two Indian Families*

The interviews were summarized and categorized initially based on family groupings or ethnicity of the immigrants, and later based on their time of arrival in the U.S., to understand common meanings, traditions, practices and relationships. For each group we examined their *migration profile, domestic and social relations, and communication modes and practices*. Later additional categories and typologies can be developed, based on distinctions in gender, single/married status, early/late technology adopters, and so on. As the analysis work is not complete, below we

summarize a case study of 4 interviews from two Indian families (husbands are brothers) from Bengal (East-India) who immigrated to the U.S. in the 70's and 80's. The nature of their relationships and communication patterns are fairly typical of other families we examined.

*Migration:* The two families migrated to the U.S. for better opportunities, and clearly had support via friends and family who were settled there previously. They have managed to maintain links with the local Bengali community as well as close interaction with work colleagues. They have chosen to stay in different suburbs for different reasons, but maintain contact with each other. There is correspondence with family abroad, however it gradually decreases over time as they lose shared context and especially if their immediate family no longer resides there.

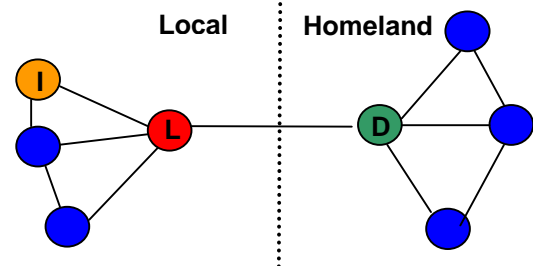
*Role of Mother as the Distant Communication Hub:* All informants have strong links with their mothers abroad, with whom they would correspond frequently both by letter and phone. The mother serves not only a parental or emotional link, but also provides news and information about others in the family. All informants found an efficient means to keep in touch with their families abroad. They feel less inclined to call all siblings living abroad, preferring to speak more often with one main hub such as the mother (see figure 1). This point is emphasized by the diminished communication pattern of the brothers (with their families abroad) after the loss of their mothers.

*Role of Wife as the Local Communication Hub:* The husbands in both families keep in touch with their wives throughout the day, both for routine home-related tasks, but also to inquire about the children (living near or away). In fact, the wife also acts as a link to their friends in the local community in their case. Hence she maintains an important communication role in the family. From closer examination of all interviews, we have subsequently discovered that the wives also maintain ties with their husband's families in India, via a cousin there (through email) who now serves the role of a distant hub in the social network. Hence, there is some evidence that the network reorganizes itself around new hubs, via new communication channels.

*Diminished Letter Writing:* Writing letters is considered less convenient and is clearly being displaced by phone and email, as the costs and accessibility improves. However, some still prefer to write every 1-3 months, partly as a habit with the older generation and also for a more personal expression. There is still much evidence of festive cards being regularly exchanged by families.

*Email vs. Voice:* All informants were enthusiastic about email and its benefits, particularly for long-distance contact. They all claimed that they would keep in touch with folks abroad more so if they had email accessibility. However, it was not perceived to be a replacement for voice conversations, which was still considered essential for most on a regular basis. There is an anxiety if some informants not have regular voice contact; it also provides emotional support.

*Ownership of home PC affects email usage:* Despite availability and familiarity with email at work, it is claimed to be used less frequently for personal contact in these families (informants worked in a busy doctor's office or used a restrictive military network for email). Both families have acquired PCs for the home, but their sons primarily use them, especially in the evenings when they come home. Hence, the PC is perceived to function as a learning tool for the child and owned by him, but not considered a communication appliance. It clearly reduces their ability to have email correspondence with friends or family abroad.



**Figure 1:** The graph here depicts a social network with local (L) and distant (D) hubs using several modalities for frequent communication, while providing an ongoing channel of awareness to others, such as the informants (I), in their respective networks.

*Coordination and awareness with family on the move:* Both families do not currently own personal cell-phones but claim that they would be beneficial for use within the family. They mention 2 key reasons: Coordination with wife and children while on the move, and to minimize their concern for their whereabouts and safety when they are out late. They seem frustrated that their children do not communicate about their whereabouts or respond to messages at certain times, This seems to be a strong point of contention in their cultural or generational attitudes which may often lead to concern and misunderstanding. They feel that providing them a cell-phone may alleviate some of these issues (However, we must note that many other informants who used cell-phones stated greater aversion to its increasing use). They do recognize their need for privacy and not being able to call their parents in the presence of others. For this purpose, a simple 2-way messaging device may be useful. They also mention a need for some form of awareness of elderly or sick relatives abroad. Clearly a convenient and socially appropriate mechanism for awareness is desirable.

The analysis work for this study has not been completed hence the results discussed here are preliminary and not comprehensive. The data from the other 14 transcribed interviews needs to be more carefully examined. Overall, the study has enabled us to get a better understanding of communication patterns and the use of technology in domestic life. Further analysis may yield deeper insights towards the use of communication modalities in maintaining relationships. An extended study can be designed to pose questions regarding awareness issues via follow-up interviews and participant observations.

### **Another Critical Domain for Future Study? - Awareness in Emergency Care**

One can argue that examining communication patterns in the workplace and domestic life can yield mostly surface issues and subtle utility for ongoing awareness. Hence, one may wish to examine a domain where the communication and awareness patterns are highly pronounced, and more easily observed among the participants. Some examples studied in the past include air-traffic control [Mackay99], subway controllers [Heath92], and space shuttle mission controllers (Voice loops) [Watts96]. However, another life-critical domain not well studied in HCI is Emergency Care in hospitals or clinics. Here a team of doctors, nurses, administrators and support staff must constantly remain aware of the status of events and the presence of others for completing life-critical operations. Doctors-on-call are usually provided with one-way pagers that allow them to be reached for emergency care. However, doctors and nurses are often found to be overworked and there are many lapses in communication where a doctor who may be unavailable or resting from a long operation is contacted rather than one more easily available and in closer proximity. There is no evidence of any published work in analyzing the communication patterns in this domain. However, it seems to be a rich area for future ethnographic work. Study of such a domain may reveal stronger patterns as these participants can be considered lead informants with extremely urgent needs. Any design solutions proposed for this domain may provide meaningful insights in broader settings.

### **Conclusions**

There has been a lack of published research or studies conducted to consider patterns of communication and subsequent design in the domestic domain. We briefly mentioned some recent HCI projects for domestic settings and related work in social anthropology on domestic interaction. To gain a better understanding of the role of communication in domestic relationships we conducted a short 6-week ethnographic study with immigrant families. The goals, methodology used, and some preliminary findings from a case study of two families, was summarized in the paper. Although our analysis is incomplete at this time, it is clear (to me personally) that social anthropology and ethnographic fieldwork must play a vital role in informing the conceptual framework and guide the design of future communication environments. The paper closes with a proposal for an extension of the ethnographic studies in both domestic and emergency care settings for gaining meaningful insights in this area. Awareness Spaces can be beneficial to enhance everyday communication in workplace and domestic settings, however their design must be firmly grounded in the social and cultural settings of the participants.

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