Technologies At Mealtime: Collocated Interactions In The Family Home

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Abstract

In this research, we investigate the everyday interactions of familial uses of technology around mealtimes and explore how family members configure the dinner space and the technologies within it. We seek to understand how technologies are used and negotiated amongst family members and the influence of technologies on the content and context of their interactions. Based on the current practices in families regarding such collocated use of both stationary and mobile networked communication devices, we identify four patterns of arranging technologies and family members during mealtimes and discuss design opportunities around it. Finally, we discuss about a novel design around collocated and collective use of personal and mobile technologies in the shared family mealtime space.

Author Keywords

Family; mealtimes; dining space; social and collocated use; personal technologies.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Family mealtimes are a critical site for the construction of family togetherness and interactions. In addition to the practical aspects of nutritional delivery, there are additional social manifestations when families come together at the same place and time to share a meal. Mealtimes become a site for the exchange of narrative accounts of personal and collective significance [8].

Social construction of family relations and the organization of family mealtimes are bound up in the spatial and material arrangements of the dining setting. Increasingly, this spatial and material arrangement of the dining context has become populated by various mobile and networked technological artefacts that come to bear on the organization of everyday mealtime practices. Such technologies may both contribute or detract from any idealized notions of family order in these settings and it is important to understand the ways that families orient themselves to the perceived opportunities or threats. Certain technologies have come under particular scrutiny, with the television being the most notable for its role in the organization of our shared eating practices [5]. Much of this has taken the form of sensationalist journalistic accounts but it nevertheless highlights a certain lack of balance in the critical discourse surrounding the position of technology within family mealtimes. Also there is relatively little research that has explored the roles, practices, and attitudes relating to the broader set of mobile technologies (smartphones, tablets, laptops, and so on) now finding a place [14] in the collocated space of our everyday mealtime routine.

We discuss three major themes for such collocated interactions in the next section. Then we briefly present details of a study to investigate these interactions and spatial arrangement of technology during family mealtimes to discuss design opportunities.

Related Works

Mealtimes are a site for the exchange of narrative accounts of personal and collective significance. Through such exchanges, there is a social construction of shared family knowledge, sensibilities, and moral perspectives. So it is not the family conversation per se as the concern, but the bonding nurtured through such means [4], and other practical (and sometimes intentional) opportunities [2, 4, 11], i.e., family accountability, event planning, educating and socializing children, etc. that have been of interest for the research community. The role of technology – in particular, digital artefacts such as photographs have received significant attention in terms of supporting these activities .One notable aspect of collocated photo sharing is the asymmetrical nature of interactional control in such groups. This control concerns the ownership of the photo or the device [7], and in the conversational asymmetry arising in such context [16].

There are three different approaches to these control dynamics. The first approach is **distributed content**, where digital material is pushed to personal devices of all participants so that everyone views the contents independently on their own device, as illustrated by Kun and Marsden [1]. This approach allows simultaneous viewing, but does not support group point-and-tell interactions (i.e. since all individuals have separate devices) and takes attention away from a common focus and shared interaction (i.e., in our case, the mealtime experience).

A second approach involves using a shared resource, for example, a projector, an interactive surfaces [13], or a television screen to display contents from all family members. This approach is often criticized for taking attention away from the shared interaction space (i.e., dining table). One creative response is the 4Photos table centerpiece prototype by O'Hara et al. [10, 15]. The prototype consists of a custom-designed 4-faced photo display to fetch and show photos from the Facebook collections of the diners and supports equal control of the system to all diners around the table.

The third approach is illustrated by Nielsen et al. [9], who brought together personal devices to create a **shared display** for all users to see. Instead of introducing additional, custom-built technology as in *4Photos* [10], a centerpiece can be created by bringing personal devices (phones and tablets) to the table and by connecting them through 'pinching' to a shared display [12]. Nielsen et al. [9] used this approach to share photos in a lab setting without any particular usage context in mind. We aim to extend this concept by introducing multiple digital formats and by taking it to the family dinning room.

In terms of technological practices during mealtimes, we are motivated by the work of Hupfeld and Rodden [6]. They provided a detailed account of the everyday practices associated with domestic food consumptions and how it relates to the ecology of mealtime artifacts and spaces – both technological and otherwise. They discussed the role that tabletops, dining spaces, and culinary artifacts play in the social organization of domestic eating practices.

In our work, we use the work of Hupfeld and Rodden [6] as a springboard to understand the ways in which a broader set of everyday technologies become implicated in the social configuration of everyday commensality practices and family relations at mealtime. In this respect we want to explicate the ways that families orient to the opportunities presented by particular technological arrangements and how they manage any concerns in their practices.

Investigating Current Practices with Technology during Family Mealtime

We conducted an in-depth qualitative study in six family homes to investigate the role of information and communication technologies during shared family meals. We began with an interview to understand the family's mealtime experience and to identify the technologies available during meals. We discussed family norms and practices regarding technology usage during mealtimes and how these have evolved over time. Participants led researchers through a tour of their homes to understand the spatial arrangements of household items and technologies.

We then provided the families with two video cameras to self-record their family mealtimes. The video recordings and the household tour contributed to an understanding of the domestic ecology of technologies and the interactions around them during family meals. After one week, we revisited the family to collect the video recordings, analysed those, and then conducted a second interview. The aim of the second interview was to encourage participants to reflect upon their use of technology during mealtimes and how it may or may not have contributed to commensality. Each interview was 30 to 45 minutes long.

Spatial Arrangement of Collocated Technologies during Family Mealtime

There is spatial relationship between how families arranged themselves and their technology during mealtime. In particular, we observed four patterns of familial arrangement around the furniture and available technologies during mealtime.

Technologies Orientate to Families

Firstly, the families arranged particular technologies that are ready-to-hand to enable easy and convenient access to them. For example, families reported that the best television viewing took place when the television was situated near the dining place. Family one, for example, mounted their most sophisticated (favourite) television on the wall closest to the dining space so all family members would have an unimpeded view. Family six situated their largest television near the dining table. The rationale for this placement was that mealtimes are one of the few occasions that brought all family members together, and that often the television was a source of interaction for the family. The DVD player, sound system, set top boxes, and Apple TVs were also often used with the television. When our participants had land phones (always cordless), they placed one handset in the kitchen for easy access. The other handset was usually in the bedroom. While some of these devices are heavy and cannot be easily reconfigured (e.g., televisions), others are small items (e.g., apple TV, land phones), yet families carefully considered how and where to place these technologies so that they make sense with the social context of the mealtime.

Families Orientate to Technology

Participants also arranged themselves around the technology so that all family members could have the best possible access to it. For example, in family 1, the mother sat on the inner side of the bench, giving her easy access to all the kitchen equipment as well as a good view of the television to watch while she cooked. The father and the two children sat on the other side, but notably, their sitting arrangement was fixed according to their heights so that everyone can enjoy watching the television without obstructing others. Similar patterns were seen with family 2 and family 6. Family 4 used a temporary arrangement they placed their laptop on top of a small bench and sat on their floor mat in front of it. Family 5 sat on a couch parallel to the television, so sitting arrangements were of less concern regarding television watching.

Certain circumstances revealed interesting scenarios of family practices in the mealtime context. For example, family 1 would eat in the kitchen where they had a smart television on the wall. A second television was placed at the back of the lounge room, which could be seen only from the side where the father sat while dining. It was evident from the orientation of the room that he had located himself to watch this second television without interrupting the other members' viewing experience of their preferred program. This sort of arrangement is not always possible, for example with family 3, where one member had to sit at a corner of the table that was not optimal for viewing the television. They sometimes took their dinner to the couch in front of the television or moved their body/chair to get a better view of it.

Hidden Technologies
Thirdly, we noticed that various technologies were hidden but available if needed. For example, mobile phones were kept either in pockets or on the dining table (family 1, 2, 5, and 6), or in a nearby place (family 3 and 4). Then, remote controllers for the Apple TV and television remained in the dining table (family 1, 2, and 5) or in a nearby table at the kitchen (family 3 and 6). Family 2 and 3 kept their laptop folded up but in reach in case it needed to be used.

Displaced Technologies
Finally, several technologies were deliberately placed away from the dinner table so as not to interfere with mealtime interactions. For example, family 1, 5, and 6 deliberately moved their laptops and tablets to other rooms (some members also moved their phones) and kept the dining table free from other technologies or artefacts that would not be required during mealtimes.

Designing for Collocated Interactions with Personal Devices during Family Mealtimes

Fischler [4] provided a historical account of how different spatial arrangements of people around a campfire or a dining table marked hierarchy during commensal eating. Hupfeld and Rodden [6] examined the spatial arrangement of dinner table artefacts and their implications for social interaction occurring at the table. In this paper, we focus on technological artefacts. We identified four spatial arrangements in the dining context: technology orienting towards people (e.g., having the best television in the kitchen), people orienting towards technology (e.g., sitting arrangements at the table), hidden technologies (e.g., mobile phone in the pocket) and displaced technologies (e.g., laptops removed from the dining table before meal starts). These configurations came out of the conscious choices of the family members to enhance mealtime experiences.

Understanding these arrangements can provide opportunities for the design of personal devices. For example, designers can either target technologies that have a prominent place already around the dinner table, or for families to reorient their technology to allow shared access. Otherwise, apps designed for mobile phones may be hidden during a meal and only be accessible before or afterwards. Dinnertime [3] is an example of such kind, which allows parents to control the smartphone usage of their children during different times of the day, specifically mealtime and bedtime.

Another design opportunity is the possibility of transforming personal devices into shared resources that support commensality. For example, combining the displays and speakers of heterogeneous personal devices to create a larger display whose content could do this and access is negotiated amongst the family. The personal devices are then designed to more appropriately respond to share environments.

Recent works have focused on such social use of personal devices. It has been noted that people naturally use technology in shared ways, even with devices designed for individual users. Yuill et al. [17] demonstrated the social interactions and associated enjoyment of drawing through sharing one tablet device among a group of children. How such combined displays augment the social experience and commensality of family mealtimes remains a question for future research.

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