
Cooking Together at a Distance: Sustain Connectedness for Long Distance Families

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Abstract

We describe the design, implementation and evaluation of the Performance Apron and Talking Bottle, two novel devices that aim to enhance and share the experience of cooking together at a distance. The devices support the exchange of voice message and cooking sounds through an augmented bottle controlled through a

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cooking apron embedded with wearable technology. This design responds to the messy, performative and communicative needs while cooking in the kitchen by interweaving cooking and communication.

Author Keywords

Intimate communication; connection at a distance; cooking; family; asynchronous; messaging; mess

ACM Classification Keywords

H.5.m. Information interfaces and presentation

Introduction

Preparing and consuming a meal are moments for connecting and one symbol of family life in many cultures. Modern lifestyle spreads families over continents, making it difficult to maintain the connection. Technology could help, but only too often it gets in the way, while we juggle between frying, chopping, whipping, and holding a phone with wet or greasy hands.

The Performance Apron and Talking Bottle are designed to enhance and share the experience of cooking at a distance (Fig. 3). The devices create a personalised space, which supports instant exchange of voice

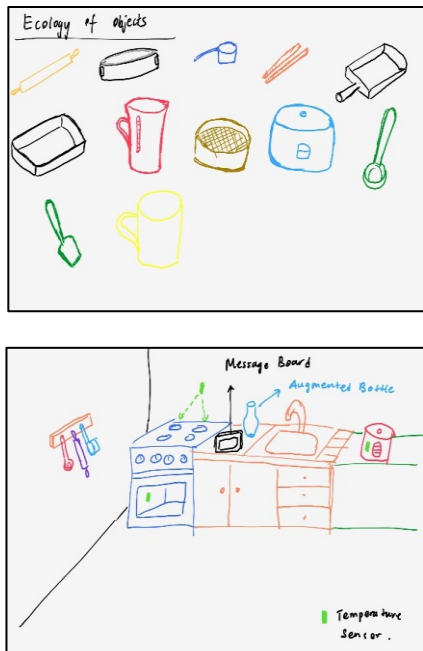


Figure 1. Sketching the kitchen and the 'ecology of cooking objects'. Initial designs considered many possibilities for augmenting and enhancing kitchen tools with communicating capabilities before settling on the apron and bottle.

message and cooking sounds through an augmented bottle controlled through a cooking apron.

Initial interviews with five young adults that love cooking and are involved in long distance relationships gave us insights into the routine and challenges experienced in maintaining feeling of connectedness with family and friends. This resulted in the initial designs that respond to the messy, performative and communicative needs while cooking in the kitchen by interweaving cooking and communication. Two subsequent dinner evaluation workshops were held to gain feedback about the prototype.

The prototype's playful design and asynchronous communication platform were well received: each participant was able to fit the prototype into their unique long distance relationship; although the desire for connectedness is sometimes at odds with individual lifestyles, augmented routines offer the opportunity to communicate at one's own pace while sharing the joy of little happenings and practices. The messiness of the kitchen space and the many objects and ingredients used are integral to the experience.

RELATED WORKS

People that live separately from their family and friends across a distance often express difficulty in staying connected (e.g. [1,3,9]). In recent years, there were many CHI research projects focused on using the advancement of ubiquitous computing and Internet of Things technology in facilitating intimate communication and meaningful interaction.

Augmented rituals were suggested as possible avenues to encourage and support communication within

families. Brereton et al reported how an augmented *Messaging Kettle* was designed to encourage casual communications connected to the routine of making tea [3]. Soro et al have discussed such possibilities in terms of augmented *habituated objects* [13], proposing that object connected to established routines or rituals are sometimes endowed with an emotional value, which opens up possibilities for interaction.

The kitchen and the dining area have been explored as possible locations for application of ubiquitous computing to foster social interaction, either at a distance or within the same space [2,4,11,12,15,16]. Many projects focused on understanding the practices that characterize people's use of the kitchen space as a shared family space. Paay et al observed the activity of cooking together and discuss how people share, negotiate and interact with and within the kitchen environment [11,12].

Scholars have explored the opportunities of the kitchen design space, from the design of specific tools to reimagining the kitchen as a whole. Davis et al [4] have described the family homemade cookbook, and Terrenghi and colleagues have proposed the sharing of digital video recipes [15] as a way of connecting with family members that relates to food making. These works suggest possible avenues for design by creating digital augmented kitchen artefacts. Similarly, *CoDine* [16] consisted of a system to support virtual dining with a distant family member through augmenting a dining table and tablecloth [5].

Many people love making food and sharing with other the process of preparing it. Grimes et al discuss *celebratory technologies* [7] in relation to food

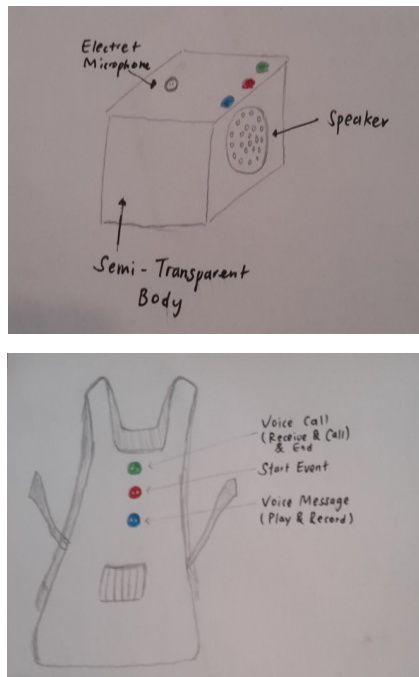


Figure 2. Initial sketches of the performance apron and messaging device, before settling on the bottle shape.

preparation, and suggest that the technologies involved in food preparation can offer a design space for enhancing positive interactions, including family connectedness. Barden et al studied the possible use of communicating technologies in a 'telematic dinner party' [2] stressing on the importance of individual cultural backgrounds to create a sense of social presence; Food is a powerful vehicle of nostalgic memories, and very much symbolizes one's attachment to family and distant loved ones. In "Things That Make Us Reminisce" [6], food was identified as one of the physical cues in making people reminisces and involuntarily invoking past memories.

PRELIMINARY INTERVIEWS

Initially, to further understand the challenge, we conducted online or face to face semi structured interviews aimed at exploring use of technology in the kitchen and how they relate to issues of connectedness and socialization for people that are involved in a long distance relationship. Recruitment (3 female, 2 male age 20-25) was opportunistic, as we wanted to engage with users that could relate to the specific scenario. We therefore contacted participants who we knew loved to cook and who are also currently engaged in a familial or romantic long distance relationship. They were friends or friends of friends recruited through snowballing techniques. Through the interview, it was no surprise to discover that each participant has their own unique communication need, but all share the strong desire to stay connected with their distant loved one. Participant A in Australia found it difficult to stay connected with her partner in the UK due to the large time zone difference. B in Tokyo found it difficult to stay in touch even though his loved one lives in the same time zone in Osaka, Japan due to the pressures

of a busy lifestyle. Crucially, social media was unable to cater for his communication needs. C in Tokyo had the desire to connect but neglected to put in more effort due to the strong existing bond with her sibling in Kobe, Japan and her busy lifestyle. D's elderly parents in Malaysia were not familiar with technology and D in Sydney, Australia found that current technology was not able to communicate the "moment" effectively.

He said: *"If I am trying to cook something exciting and challenging, I would like to impress my parents by sharing the event. I'd like to be notified, when my parent is cooking some traditional home food. That makes me nostalgic and sentimental."*

E commented: *"When I call mum, conversation is interspersed with the sound of chopping or ...hang on two secs I have to put it in the oven. I start off trying to cook with one hand and one on the phone and then realise I need both hands so move to putting on speaker [...] The tech sometimes ends up being the victim of food splashing. More than one time my Mum's phone has gone for a swim in the kitchen sink"*.

In summary, the initial findings of the interviews suggested people neglected to maintain frequent communication with their family because of existing strong bonds in the relationship, some found it difficult to communicate the "moment" through other media and when there were time zone differences some missed the time window available to connect. All participants expressed a love of sharing food and cooking. Those who did connect while cooking had some interaction difficulties. Each relationship had a unique story and need behind it and each participant was hoping to stay better connected with their loved



Figure 3. The performance apron and talking bottle in action: when the user presses a button on the apron the bottle will record the ambient sounds together with any messages or conversations. The recordings are sent to a corresponding device where they can be replayed. The bottle (bottom right) glows when a message is present.

one, sometimes asynchronously and sometimes having asymmetric communication needs. When we suggested the possibility of augmenting the cooking routine or the kitchen space, all participants were open to the idea and keen to participate to see if they could blend communication with cooking.

DESIGN RATIONALE

Many preliminary prototype designs were generated. One, “Ecology of cooking tools” (Fig. 1) envisioned a mesh network of kitchen utensils which communicate with a distant party about the tools which were being used. Our preferred design consisted of an augmented bottle, “Talking Bottle” which supports instant exchange of voice messaging and cooking sounds in the kitchen, and an augmented apron “Performance Apron” designed to allow easy speaking of messages and hand wiping and to wirelessly control the Bottle (Fig. 2).

The Apron fits well with the performative aspects of cooking. It leaves the hands free and saves the cook (and the electronics) from splashes of water. It also lets users think of technology in a different way: a button on an apron is more than a button, it is a button that one can wipe hands before pressing. The bottle in turn is an object that belongs to the kitchen bench. Although this prototype is not a real bottle that can be used with fluids, it was designed to help people imagine the scenario of having a kitchen object that also serves a purpose of situated calm display.

Talking Bottle and Performance Apron were designed to connect with another pair of identical devices located at another distant kitchen. The bottle is semi-transparent and can glow in three different colors (Fig. 4) to communicate a cooking event and when a new voice

message is received. The first button on the apron starts the voice recording through a microphone located on the bottle. While recording, the bottle glows in red. When a voice message is received the bottle glows in blue and pressing the second button on the apron plays back the message. Pressing the third button on the apron will make the bottle glow in yellow in the distant kitchen to let the remote party know you are cooking.

The initial prototype only implemented asynchronous messaging to reduce the scope and test the concept more quickly. The design centered around (1) understanding and using an existing routine to spark communication [10], (2) augmenting objects that are already habituated in the kitchen space, and (3) exploring how communication is interweaved with cooking. While many existing platforms such as phone, social media and Skype support real time communication, this prototype was purposefully designed to address communication in the kitchen, through spoken messages interspersed with cooking activity with a personal hotline to and visual reminder of a distant loved one.

DINNER EVALUATION WORKSHOPS

To explore the use of the prototype, two dinner evaluation workshops were held one week apart from one another. The workshops were devised as a way to help participants imagine themselves in the context of use. We acknowledge that a full deployment of a prototype and a longer term study across individuals would yield more detailed results, which is indeed a next planned step. For this iteration however the open ended nature of contextual inquiry and the possibility of adapting to the situation at hand represented an advantage over other viable approaches (e.g.



Figure 4. The Talking bottle glows in different colours to signal the availability of voice messages or that someone is cooking in the remote kitchen.

technology probes [8,14]). At the same time a focus group in context represented an efficient way to allow participants to build off each other's ideas, stories and experiences.

Three participants joined the first workshop, and two joined the second. The first author was the host in both cases and interacted with all participants as such, while also inviting everyone to try the technology, record a message, wear the apron, etc. When some significant remark was made the researcher openly took note of it, sometimes asking the participant clarifications, and if the note was accurately reflecting their thought. After the workshops the notes were discussed within the research team, also in the light of the first author's account of mundane aspects of the workshop (what was cooked, what were the topics of conversation, etc).

The experience was more akin to cooking with friends at a party than any typical workshop. As the host explained: *"Everyone arrived at slightly different times and jumped straight into the kitchen to start preparing the dinner. It was noisy, and sometimes two or three conversations were happening at one time. At first, they were slightly leaning to the bottle and yelling into it. The recording was filled with person's voices, and the noises of cooking. After learning the range and sensitivity of the microphone, they start to talk to the bottle instead."* Participants found it amusing when their side conversation was picked up by the bottle. For example, S and E were chatting on their own while preparing the ingredients, and L decided to talk into the bottle. Later, L played back the recording, and the girls were laughing when they heard their conversation.

After dinner, each participant was interviewed for feedback about the design of the prototype, and for a potential use case of the prototype in their relationship. Scenarios suggested by participants are Christmas dinner, weekly lunch gatherings and dinners. The main themes that emerged are: (1) the asymmetries in the need for communication, (2) asymmetries of cooking practices, and (3) the unfit of some technology for the messiness of the kitchen bench.

FINDINGS

Key findings from using the Talking Bottle and Performance Apron prototypes related to asymmetries in the need for communication, asymmetries in cooking practices, and communication while cooking.

1. Asymmetries in the need for communication.

Many participants talked about asymmetries in the need for communication. Whereas parents wanted to hear from adult children, adult children in their twenties felt less need to communicate with their family, even though they felt they should." One said *"It's ok to not keep in touch with your family as often because the bond is strong and they are always there. However, if you stop talking to your boyfriend and girlfriend, the relationship is gone."* Another said *"once a week, my mum is usually the one who organises the skype call so that we can talk. I am not that organised"*. Most participants felt pressure to talk for longer than they would like in voice calls stating. *"You can't talk for 5 mins and just hang up."* Whereas they felt that *"With this device you can say "Hi, good morning". With this device, there is no pressure. One said "For skype, you need to sort out times, but with this device you can just leave a little message."* Somehow the device communicates the idea that it is ok to leave short voice

messages and participants saw value in this. It was “like snapchat” but with a place in the kitchen for communicating with a special person.

2. Asymmetries in cooking practices. There were asymmetries in the amount of cooking within relationships. In some relationships both people loved cooking and cooked a lot. In others, one cooked more than the other. Some liked cooking but didn’t because of their circumstances. As one participant said “*My mum, she cooks dinner every night and will be in there for an hour and a half, and also cook lunches for the next day for everyone. She cooks a lot and drinks a lot of tea. I reckon she will use it. I don’t cook as much. I also don’t call my mum enough, once a week, once a month. I would put it on my computer desk because I don’t cook but my mum does.*”

3. Communication challenges while cooking and eating. All participants loved to cook. They were all tempted to wipe their hands on the apron. We commonly heard “*Ohh I almost wipe on your apron!*” They felt they shouldn’t as it was a prototype. One said, when I cook, I will change to old clothes because I make a mess. I use a tablet while cooking, but I avoid touching them because I don’t want to dirty them. Participants liked that the bottle and apron addressed the problem of using devices with messy hands. One related communication challenges of having Christmas dinner apart “*When my family is eating Christmas dinner, we all sit around a table. But my brother is in England. We usually skype, but there is just noise because we just pass around the phone, and everyone is just saying “HI! Hi! Hi”, people faces are coming in from every angle. It is also not dinner time there*”. It was felt that this device could record

messages when “everyone takes turn to help out or come and chat in the kitchen.” “My brother that lives in the UK will be able to join the “moment”, and those familiar voices and noises will definitely bring back memories.

DISCUSSION AND CONCLUSION

Our study explored the use of a novel communication technology to stay in touch while cooking. Participants appreciated the idea of simple, asymmetric communication around cooking particularly with their parents and grandparents, with whom they could keep in touch through short messages when busy, rather than long phone calls. They liked the idea of recording quick kitchen conversations and comments that communicated the fun of cooking, and they felt nostalgic about food. There was little discussion about particular chopping and sizzling noises, suggesting that these are not the focus of sound recording but just incidental to other conversations around cooking. Technology and mess don’t mix and yet mess can be fun. This suggests that we pay more attention to technologies that allow us to be messy, such as the Performance Apron (washable version). Our study contributes an innovative design that allows people to communicate while cooking and making a mess.

The next step of this research will be to further explore the use of the prototype in a real scenario and for a longer period of time. It is well known that placemaking and appropriation require time and effort on the users’ part [13]. To better expose the nuances of the asymmetries in practices and desire for communication it is necessary to go past the novelty of the design, to evaluate how engaging it is in the long term, and observe its use in daily life.

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