Reactions to Mixed-Context Always-On Video for Connecting Close Personal and Work Contacts

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ABSTRACT
Commercial video chat systems are now commonplace in people's lives where they are used for a combination of work and personal needs. Most are designed for conversation-style interactions where people 'call' each other and converse. This paper explores an alternative design paradigm of 'always-on' video connections for communicating with *both* personal and work contacts. We conducted an online survey with forty-five respondents that investigates people's reactions to such technology followed by a four-week field trial with five participants who used a fully functional mixed-context media space. Our results show that many people saw value in such a system, yet had reservations about the 'always-on' nature. Most said they would use it in observational situations. Field trial participants also faced challenges with an automated audio channel and a lack of dedicated devices. The implications are that while such systems can provide an easier communication channel, concerns with distractions, trust, and privacy should be mitigated within the design.

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

Author Keywords
Video communications, media space, 'always-on' video

INTRODUCTION
Always-on video media spaces were widely explored in the early days of the field of Computer Supported Cooperative Work as a way to connect collaborators over distance. The goal was to support informal awareness and casual interactions [3,4]. More recently, we have seen the exploration of 'always-on' video in the home. This has involved the design of family media spaces with the goal of supporting connectedness between family members through an awareness of everyday activities [5,6,7]. Studies of family media spaces have typically focused on the reactions of a small number of users (e.g., four to six families), rather than a larger sample. There are also few studies that explore always-on video that can be used for connecting *both* personal and work contacts. This mixed-context presents interesting opportunities for user benefits, along with user challenges.

To address this, we conducted an online survey followed by a field trial with select participants. During the online survey, respondents were presented with several scenarios depicting the usage of an 'always-on' video system used in *both* home and work contexts: a mixed-context media space. Respondents were asked questions about each scenario as well as their overall reaction to the system. During the field trial, participants were asked to use an 'always-on' video system during their daily lives for a period of four weeks.

Our results from the online survey revealed mixed reactions to the system concept. There was a minority of people who valued such a design, while a larger number raised privacy concerns. These directly related to connecting between home and work settings, or within work-to-work settings. Observational situations (e.g., checking on a babysitter or pet) were more widely accepted. This suggests that while people see the benefits of such systems, privacy concerns still need to be mitigated. Similarly, our results from our field trial also demonstrated some mixed reactions to the core functionality and use of the system within a real-world setting. While some benefits were recognized from the use of an 'always-on' video system, participants shared their barriers to the use and adoption of the system.

RELATED WORK
'Always-on' video communication systems have been studied in a variety of contexts. First, within the context of the workplace, research has explored how 'always-on' media spaces could benefit co-workers [3,4]. Many people experienced positive reactions to 'always-on' video because it supported the easy transition between awareness and interaction amongst co-workers. Even still, some people expressed privacy concerns because they may be accidentally captured on camera as part of the background [1]. Others expressed concerns about accidentally doing something on camera that may be privacy sensitive [1].

Second, within the context of the home, Skype connections have been found to be left on in a (nearly) always-on

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fashion by long-distance partners [9] and teenagers connecting with friends [2]. The use of family media spaces revealed that this worked well for connecting family members who shared close relationships, thereby 'side-stepping' concerns about privacy [6,7].

Third, in relation to mixed-context media spaces—connecting across personal and work contexts—we see less literature. The Home Media Space connected telecommuters to office-based colleagues but was never evaluated to explore user reactions [8]. The 'ME'dia Space connected a telecommuting professor with his research lab at a university [10], but, again, it was not broadly studied to explore user reactions. Thus, our survey builds on the related work to specifically focus on exploring user reactions to a mixed-context media space that can connect individuals with *both* personal and work contacts.

ONLINE SURVEY

To gauge user reactions to mixed-context always-on video, we deployed an online survey.

The Proposed Mixed-Context Media Space System

First, the survey described the design of a prototype mixed-context media space that users could run on any tablet or smartphone. We included a comic picture of the system as shown in Figure 1 for two reasons: (1) to disassociate the systems from any particular brand, and (2) to present a low-fidelity form in hopes of generating greater feedback. The survey told respondents that users could place a tablet or smartphone on a table and video would transmit automatically to another selected location. Audio would only transmit when a user was looking at the display. The system was described as allowing one to connect to his or her close contacts regardless of whether they were family, friends, or work colleagues. The design could connect to one location at a time and a user could toggle to automatically connect to another 'open' video link without the remote person 'answering' the call.

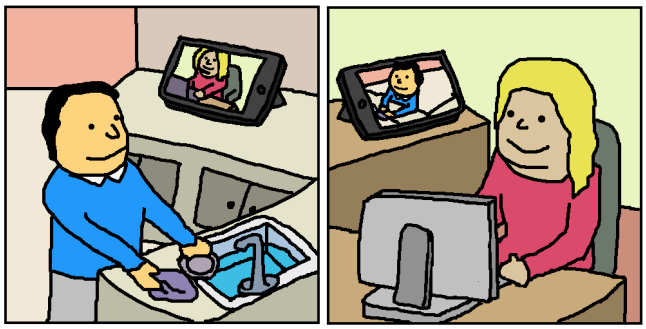

Figure 1: The mixed-context 'always-on' video link.

Usage Scenarios and Reactions

Second, we presented a series of scenarios to the respondents; a sample scenario follows:

Scenario 1: George and Kayla are married and have set up two tablets with the system. One sits on their kitchen counter in their home and the other is on George's desk at work. At any point in time, George can connect to the home tablet from work to see what the family is up to. The same goes for Kayla, she can easily connect to see George working at any point in time. The remote location doesn't need to accept the call; it just connects when they ask it to. One day, George connects to the system in his kitchen while he is at work. George notices Kayla periodically throughout the day in the kitchen. At one point, Kayla notices George and they smile and wave at each other. Kayla then asks George what he wants for supper. He responds and then continues with his work.

We included six scenarios that were either person-to-person connections (work-to-home, work-to-work, private-to-home) or observational situations (work-to-home). We selected these six scenarios as they presented the most likely uses of a mixed-context media space based on past literature [3,4,6,7].

Following each scenario, we asked participants to rate their comfort level with using the system on a scale of 1 (very uncomfortable) to 4 (very comfortable). We asked them to indicate whether they would use the system in the particular scenario and what issues, if any, they had about the scenario. We also asked with whom respondents would be comfortable using the system with; what privacy concerns they would have, if any; and, what benefits they thought the system would provide them, if any. In total, the survey took approximately 15-20 minutes to complete.

Participants

We posted the survey's URL on Twitter and Facebook and forwarded emails about the survey to family, friends, and work contacts through a snowball sampling method. We also provided bonus course credit at our university for students who completed the survey. Other respondents did not receive compensation. We received forty-five responses (28 female) to our survey. Participants ranged in age from 19 to 65 (20 were between 19-25, 15 were 26-36, 9 were 37-50, and 1 was 51-65). Half of our respondents were university students (though some had additional jobs) while the remainder had a variety of occupations. 82% of respondents indicated they currently used video chat systems, such as Skype, FaceTime, and Google+ Hangouts.

Data Analysis

We analyzed our survey data using a thematic analysis to draw the overarching themes and findings. We present the initial impressions of the system, followed by the main reactions for each of the six usage scenarios.

SURVEY RESULTS

Initial reactions by our participants to the system were mixed: some liked the potential in such a system, but had concerns with privacy and the nature in which the video connection was automatically triggered. They described the desire for more control as to when and how others could connect. Others were completely adverse to the idea of an 'always-on' connection and found the concept to be creepy, intrusive, and distracting.

"Initially I thought it was good. The idea sounds very user friendly without too much set up requirements. This is particularly good for family and friends from different parts of the country/world. However, the idea that anyone can automatically access the video may be a bit disconcerting. There probably should be some sort of control to accept/not accept connections automatically." – Male, Age 37-50

"It seems a bit intrusive. I wouldn't want to be watched at all times. The fact that it can send video by just being turned on worries me because I leave most of my gadgets on at all times." – Female, Age 19-25

When asked with whom they might use the system with, respondents most often identified close family members: 78% said with a partner, 80% said with their children, and 26% said with their parents. In addition, 51% said with close friends and 47% said with co-workers, while only 20% said with one's manager/boss. Next, we present findings from each scenario.

Scenario 1: Work to Home

Eleven participants (24%) indicated they would use the system in the way depicted in Scenario 1 (shown earlier); twenty-two (49%) said they would not, and twelve (27%) said 'maybe.' With a range of 1 (very uncomfortable) to 4 (very comfortable), the median comfort level score was 2.3. People generally felt that the work-to-home connection could be intrusive for one party and distract the other person while at work. Thus, they saw the value of the system but did not want to intrude on either person at an inappropriate time.

"Having a casual open line for communication is something I miss when I'm not with people. I would even use this with my mom, who lives 700 miles away. It would be great to chat as if we were in the house together doing our own thing." – Female, Age 26-36

"It is slightly distracting. If I was George and I had a screen to my home, I would not be able to focus on my work and want to talk. I guess I am uncomfortable with constant surveillance, even if it might just be your family or loved one." – Female, Age 19-25

Scenario 2: Two Commons Areas at Work

Scenario 2 described two devices connecting between common areas in a work setting (on shared group tables). Colleagues notice each other by passing by the displays and would stop to chat. Nineteen participants (42%) indicated they would use the system in this scenario; ten (22%) said they would not, and sixteen (36%) said 'maybe.' The median comfort score with the scenario was 2.8. Again, we received mixed reactions to this scenario; while participants noted the usefulness and convenience of collaborating with co-workers, some voiced concerns with feeling untrusted at work. That is, even though they realized they could connect with their co-workers, there was a fear that management may also use the link to 'check up on them.'

"The attractiveness of this product in an office environment is the simplicity and ease of use. It would be more effective than teleconference for meeting purposes between different office locations." – Male, Age 37-50

"Having your boss always watching you feels a bit disturbing. A bit big-brotherish. But, I can see how it replicates a security camera or something of the sort. I can also see how the constant presence of your boss may make employees feel like they're untrusted." – Female, Age 19-25

Scenario 3: Two Co-Workers' Offices

Scenario 3 described two devices connecting between two co-workers' private offices. Colleagues chat periodically throughout the day about projects. Nine participants indicated they would use the system in this scenario (20%); twenty (44%) said they would not, and sixteen (36%) said 'maybe.' The median comfort score was 2.3. Those who liked it clearly valued the ability to easily connect with remote co-workers, almost as though they were in the same location. Others felt other technologies already sufficed for impromptu exchanges throughout the day. There were also concerns about becoming distracting by the video link or wanting to maintain privacy within one's own office.

"From personal experience, when working in a team it's quite difficult to meet up together with others. With that said, having a device that will make it seem like the members are working in the same environment seems quite convenient." – Female, Age 19-25

"Whether or not distracting, it still seems like a waste of energy to just have it on all day so that they can chat instantly. If Joe had a question he could have just sent an email and waited for a reply." – Female, Age 19-25

Scenario 4: Babysitter Cam

Scenario 4 described a parent checking up on her kids being babysat at home while she was running errands. Twenty-four participants (53%) said they would use the system in this scenario; five (11%) said they would not, and sixteen (36%) said 'maybe.' The median comfort score was 2.7. Generally people valued the idea of ensuring that their children were safe. Some felt entitled to check-up on their kids, even if it infringed on the babysitter's privacy. Despite this, for some people there was still hesitation due to the usage being more of a type of surveillance tool rather than a communication tool. Some people described wanting the babysitter to somehow approve the connection without taking her away from watching the children.

"We have a video monitor for our son's room and his daycare has webcams - both are wonderful. It's so nice to see what he's up to, and I also love the safety factor. In this scenario I would actually like the option to not show when I'm looking, both to [sic] distract my child if they are trying to do something and to keep the safety check aspect." – Female, Age 26-36

"Even though it's only to check up on things at home, there's still a matter of privacy involved if another person who's not part of the family is in your home much like the babysitter situation." – Female, Age 19-25

Scenario 5: Pet Cam

Scenario 5 described a person connecting to an in-home display from work so he could check on his dog. Thirty participants (67%) indicated they would use the system in this scenario; five (<1%) said they would not, and ten (22%) said 'maybe.' The median comfort score was 3.4. This was the highest ranked scenario in which participants would likely use the system. While some respondents did not own pets, they saw potential in being able to check in on their dogs throughout the day to keep them company and observe their general activity. Most participants noted that there was no real concern with privacy within the context of observing pets. Some said that pets do not have privacy concerns.

"Sounds perfectly reasonable with me. You can watch your dog; the dog gets to see you and may feel less lonely." – Female, Age 19-25

"It's a super easy way to keep an eye on your dog to see what he's up to… I don't feel like it's an invasion of privacy so it is an appropriate way to use the system." – Female, Age 19-25

Scenario 6: Long Distance Couples

Scenario 6 described a person connecting to his partner in their bedroom before bed while he was away traveling and at a hotel. Eleven participants (24%) said they would use the system in this way; twenty-two (49%) said they would not, and twelve (27%) said 'maybe.' The median comfort score was 2.3. Those who said they would use the system or 'maybe' use it had often been in a real life situation similar to the scenario. This made the system immediately valuable. Some even used Skype or FaceTime in a similar, though not identical, configuration. They felt that because the two users were close family there were no privacy issues. Despite the large number of people who said they would not use it in this scenario, only two people reported strong concerns. We suspect the rest simply were not in such a life situation so would not use it in this way.

"I was in a long distance relationship with my boyfriend for 1 year and we used Skype to communicate all the time. Sometimes we just left the Skype on, and we could freely do our things… If at any time I'm not comfortable with him watching me, I can just tell him to logout for a while." – Female, Age 19-25

Additional Features

Participants described a range of additional features that they wanted to see in such systems to mitigate privacy concerns. This included ideas such as not being captured if walking in front of the camera as a background user, knowing who off-camera could hear them, detecting people's faces and only transmitting video when certain individuals were on camera, having a privacy-screen that limited viewing the video stream unless a person was directly in front of it (so one could know who was looking), and an 'accept' call button. People also talked about letting all people who might get captured by the system know of its existence. Others talked about ensuring that all users had the same intentions for the system (e.g., focused on communication and awareness but not surveillance).

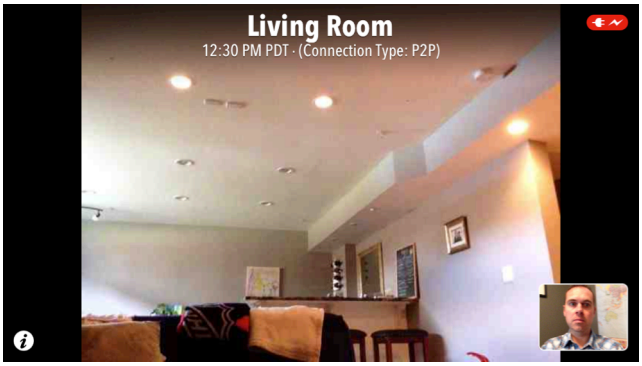

Figure 2. Perch running on an iOS Device and sharing synchronous video between two locations.

THE DESIGN OF PERCH

Following our survey, we wanted to study mixed-context media spaces using a fully-fledged system. We did this using a system called Perch. Perch is a video communication system designed to connect people who share a close relationship, be it family members, friends, or co-workers.

Design Features and Usage

Users can install and launch the Perch app on any Apple iOS device, including an iPhone, iPad, iPad Mini, or iPod Touch. It can also be used in combination with Apple AirPlay where an iOS device can mirror its display on a large television. This means that video communications can occur on nearly any sized display from small to large.

As part of the setup of Perch, users 'join' their device to one or more 'home' or 'work' groups. This permits any devices from within that group to connect to it for communications. Following this, when Perch launches, users can pick which location / device they want to connect to in their designated groups. Once a connection is established, users share video between the two devices until the app is closed. If the app detects that a face is in front of a display, audio is automatically transmitted to the remotely connected display. In this way, users can smoothly move into and out of conversation with the remote location without physically touching or interacting with a device. Figure 2 shows the user interface for Perch once a connection is established. The user's local view is shown in the bottom right corner of the user interface and the remote view is shown in the main portion of the interface.

Perch is ideally used on iOS devices that remain stationary within one's home or workplace. Suggested uses included mounting an older or unused iOS device on the wall, or placing it in a fixed location using a stand. However, one could certainly use Perch intermittently on an iPhone while mobile.

Comparison to Other Systems

Perch is different than other commercial video chat systems such as Skype or Google+ Hangouts because it leaves video connections 'open' and available for access; a remote person can connect to one's video feed even if the person is not there. Its design is most similar to always-on video systems such as the Family Window [6], which provided always-on video between a tablet device in each of two homes, and Family Portals [7], which did the same for three homes. However, Perch differs in that it provides an audio link as part of the system and it also allows users to setup and connect to any number of Perch apps in various locations. Thus, it allows users to create a multi-display media space with a configuration that is at their choosing. Video frame rates are also fast (e.g., 20-30 fps) compared to other research prototypes (e.g., 2-3 fps).

FIELD TRIAL

We wanted to evaluate real-life usage of the 'always-on' video system, Perch, in a variety of settings, including home-to-work, and work-to-work situations. Participants were required to download and install the Perch application (instructions and remote support were provided) and, over a period of four weeks, use the system at least once every day during the first week (and as much as possible in the three weeks following). We then sent each participant a set of questions weekly that required him or her to record their video responses and submit to us. Questions sought to explore how the participants used Perch, specifically, who they used it with, what features they used, when they used it, what devices it was used on, and where it was used. We also asked participants (on a weekly basis), to share their most and least favorite experiences with Perch and to let us know if there would be anything they would change in Perch. Additionally, week one's set of questions included a question about the process of downloading, installing, and setting up the Perch application.

The study concluded with a one-hour video interview asking participants about their experience using Perch. We asked questions about participants' practices with Perch, such as an estimate of their actual usage of Perch during the trial period as well as descriptions of scenarios in which they would use Perch more frequently with their family or co-workers. During the interview, we also asked questions about any social concerns and benefits participants encountered while using the system. Our last set of questions asked whether participants would continue using Perch after the study and whether they would recommend friends to use Perch. We also sought to understand device and location placement choices, and who they would provide devices to, if participants had access to more devices. For this we asked them how they would use Perch if given $2,000 or even $10,000 to setup an 'always-on' environment.

Participants

Six participants were recruited for our field trials from the pool of respondents from the online survey. One participant withdrew from the study as she did not find there was sufficient use of the system for her. We specifically sought a variety of demographic backgrounds in order to best understand real-life usage (Table 1).

In order to participate, participants needed to have one or more iOS devices such as an iPhone 4S or better, iPad 2 or better, iPad Mini, or iPod Touch Generation 4 or better. All participants currently used existing video communication technologies, such as Skype, FaceTime, and Google Hangouts.

	Age	Gender	Occupation	Family Members
P1	37-50	F	Software Trainer	Married, 2 children (10, 13)
P2	37-50	M	Research Fellow	Married, 3 children (between 1-6)
P3	26-36	F	UX Designer	Live alone
P4	26-36	F	PhD Student	Married, long distance couple
P5	26-36	M	Software Engineer	Live alone

Table 1: Field trial participant demographics

Data Analysis

We analyzed our field trial data using a thematic analysis to draw the overarching themes and findings. We present the benefits of the system, followed by the barriers to the adoption and use of the system.

RESULTS: BENEFITS

Given their experience using existing video communication technologies (e.g. Skype, FaceTime, etc.), participants were open to the idea of an 'always-on' connection. Setting up such a portal enabled participants to feel like they were able to maintain an awareness of activities in their home as well as communicate with others living in a different country. Thus, usage of Perch for connecting with family or friends was highly valued.

"I would definitely just set up Perch in my house in Chicago and leave it open all the time. I would use it all the time to check in on the house, or my husband, or on my dog. The fact that I don't have to have someone accept the call on the other end is the most useful feature." – P4, Female

"I like to see my parents' place to see what they are up to. For me it feels like being there again. Sometimes I might not be able to sleep late at night or when I come back from work, it's day time there and I feel the energy of starting a new day from them." – P5, Male

As seen during the online survey, parents and pet owners saw benefits in facilitating the remote watching of their children or pets.

"I think it would be good for when my kids come home from school; it's 2 hours before I get home from work. I want to make sure that they're practicing piano or doing their

homework. It's more of a way to check up on my kids." – P1, Female

"In theory, I think that it was working well when we had a connection. It's definitely a great concept. I really like being able to dial in at any point so I can check in on my dog. I didn't get to do it that much. It would be in a location where my dog usually is – he'd be there for part of the time and then go off somewhere." – P4, Female

There was also potential seen in having Perch set up in a meeting or lab space, where it could be useful for people to drop in and chat. In this way, participants felt an 'always-on' connection could also be used to support workplace collaboration and communication.

"If we had an extra one set up in our meeting/lab space, it would be useful for us to drop in and talk with us. We have different meeting rooms and meet every week in a different place, and people work in different rooms." – P4, Female

RESULTS: BARRIERS TO THE ADOPTION AND USE

Though participants had one month to evaluate the use of Perch, participants' actual total usage of the system over the course of the trial period only ranged between 1-3 hours each. Participants experienced some technical difficulties and their usage of the system tapered off towards the end of the trial period as a result. The lack of adoption and use of Perch was caused by a number of factors.

Lack of Dedicated Devices

One common problem seen amongst participants was the lack of an extra device to dedicate as an 'always-on' portal. Given that the system requires an iOS device, people were not able to dedicate their iPhone or iPad at home or work as they required it for use throughout the day. The lack of dedicated devices restricted participants from using the system. When we asked them how they would create their ideal setup for Perch if they had additional money to purchase devices, participants easily described their ideal setups as including multiple devices spread throughout a variety of locations.

"I would probably be purchasing multiple iPads (that would be four iPads or something, I guess). In that case, because there would be so many, I'd put one in my home studio, one in my home bedroom, one in my apartment in Vancouver, and one in my workspace in Vancouver. And actually, one from the house in Chicago would go to my husband's office. If everything is all connected, we'd probably do that as opposed to calling/texting in, if someone was always in a Perch environment." – P4, Female

"I'd probably get the mini iPads and then each kid would get one. When they get home, they would have to turn it on wherever they were during that period of time so I would know where they were. I'd hang one in the kitchen – and one for my mom in her place where I can angle it to see where she always sits. I'd probably even put two in there, so in case she ever fell or something, I can see her." – P1, Female

Concerns with Privacy during a Work Environment

For some participants, using an always-on video communication system appeared like a breach in privacy within a workplace setting. This was also echoed in the results of our online survey.

"I think privacy is so important in work environment, I would imagine if they install a camera in any place in our company even the public area, a lot of people complains about that. So we use web cam and video chat to contact each other but this is different from a system that you can think somebody has the ability to watch you all the time." – P5, Male.

Participants said that their main concern was that the remote person could look at them any time and that they might not be aware that they were being watched.

"I would have this feeling for every moment of the eight hours of working that somebody might pop in and watch me and this is annoying for me." - P5, Male.

We found it was also challenging for us to find participants who would be willing to use Perch in their workplace. In fact, our only two participants who were interested in using Perch in their workplace found they could not get a willing work colleague to use the system with them once the study began.

Despite these challenges, participants more generally believed that using Perch at work would depend on the configuration. For example, it may be less privacy invasive if it did not monitor one's workstation closely. Moreover, participants felt it could depend on a person's job as some professions might be more open to being observed because they are working in more social and public environments.

"It's a fabulous way to help interact with my husband, but I guess if I was talking more with co-workers, I might be a bit less interested in having it always on in my house where my co-workers can dial in at any time." – P4, Female

Automatic Face Recognition

All of our participants expressed concerns with what would seem to be the core functionality of Perch: the automatic face recognition and the microphone turning on/off accordingly. Participants found it difficult to keep their faces in front of the device and would limit mobility. The notification sound for face detection also posed a challenge for participants who had difficulty turning it off and was irritated by it as a result.

"When you lay it down, and keep it on, when your phone turns off, or goes to sleep, Perch shuts off. Even if I wanted to keep it on, it would fall asleep. Like if I was cooking, I would step away and then go back and it would be off." – P1, Female

"The biggest thing, to start, was to try to keep your face in that tiny little box so you can get the microphone to come

on; you could leave the mice on for 10, 15, or 20 min but the drawback was the mic stayed on even after the conversation was off and you could hear the background noise." – P2, Male

"We definitely didn't use Perch as much…It was mainly the general functionality. It was difficult to maintain a continuous video. Most of the time it was very difficult to keep the mic on. Or the sound notification of every time it was connecting. I was trying to find a way to turn off the sound notification but there wasn't." – P4, Female

DESIGN ENHANCEMENTS

Participants also talked about ways they wanted the design to be changed to improve their usage. Suggestions mostly related to a lack of participant-level control with the software's functionality. They desired more control, especially with a tool designed to be 'always-on'.

"I found that the choices in how much control the user has in when the mic was functioning, the facial recognition… to talk to my husband, or check on ideas or to have a more lengthy conversation, I had limited control over when the mic was on or off. We do tend to work a lot simultaneously, even in different cities. Like while cooking, and though I tried to lock the mic on, I wasn't able to continue talking. I know there was an option to set a timer, but for some reason I wasn't able to get it to work." – P4, Female

Some participants also experienced difficulties when using Perch on mobile network connections such as a 3G cellular network. Despite Perch working on both cellular and Wi-Fi networks, participants felt that maybe this was not the case because of difficulties in connecting to others while mobile This was often seen as being inconvenient by participants during public transportation commutes when they wanted to check in on their home.

"It doesn't work on 3G. When I'm on the Skytrain, I would try to Perch home, but it never worked. And it never worked at work either. Maybe there was a firewall. Though if I wanted to FaceTime I could. Perch would just blank out. It doesn't even work when I'm trying to check on the kids on the Skytrain. I tried to get it to work at work and I couldn't do it." – P1, Female

DISCUSSION AND CONCLUSIONS

Our results reveal a mixture of privacy concerns and potential uses for a mixed-context media space. First, the most likely use for an 'always-on' video connection was with pets or checking on children. These are both observational situations where participants felt somewhat of a 'right' to observe. For pets, people felt there were no privacy concerns. For checking on children and the babysitter, privacy concerns related to autonomy [1] because the babysitter did not get to say when she was 'a part' of the connection. This made some people 'feel bad,' yet was trumped by the benefits of the system. This points to the most likely uses of the system, with the potential for additional options to allow individuals to choose when and how they participate in the space. In an observational setting, 'accepting' a call may not be the smoothest of interaction techniques. This suggests face-to-face negotiations prior to using the system to inform others of it.

Second, larger concerns arose for person-to-person situations, in particular work-only usage. Again, participants recognized the benefits of person-to-person connections; however, some felt that an 'always-on' connection could be distracting or even unnecessary. Thus, privacy concerns mostly related to solitude [1]. This suggests additional mechanisms that allow one to control when they can be 'interrupted,' e.g., when the system is on. Certainly there was strong concerns about a boss using the system and suggests usage amongst peer co-workers. Work-to-home connections were problematic given the mixed-context: at home, people did not want to interrupt the worker. Again, this points to the need for solitude-preservation features [1]. When contexts are both private / personal, privacy concerns tend to go away for close family members. Distraction or interruption was rarely mentioned and people were not concerned about their appearance.

Overall, our results show a stronger set of privacy concerns than has been reported of family media spaces [6,7]. We believe this comes directly from the introduction of a mixed-context. We also feel that users of technology such as 'always-on' video tend to be more hesitant, with a feeling of 'I need to try it first before I know.' Indeed, some respondents said this. Thus, while valuable, we recognize that our results can be strengthened through the actual use and testing of such systems where users can experience the benefits of them firsthand to learn if they are greater than the privacy risks. We pose this as future work in the area.

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