"It's Kind of Boring Looking at Just the Face": How Teens Multitask During Mobile Videochat

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Mobile videochat use has been growing, especially for teens. To better understand teens' videochat practices, we conducted a two-week photo diary study with 16 teens. We found that most often, teens videochat with their closest friends from their bedrooms when they feel lonely or bored. Teens turned to videochat when understimulated but also felt understimulated during videochat. In order to manage this, they multitasked– teens moved from active chatting to co-presence while engaged in separate activities like scrolling social feeds or playing games. We uncovered social norms of reciprocity of attention, where teens match the attention level of the other and give leeway to briefly divert attention. Digital notifications did not feel disruptive to the videochat but family members' interruptions felt disruptive as teens' domestic context intruded into their virtual peer setting. We discuss these findings and their implications for research and design of videochat systems.

1 INTRODUCTION

Mobile videochat is growing in popularity. More than half (52%) of smart phone users age 18-34 make video calls [35]. WhatsApp announced that its 1.2 billion users are spending more than 340 million minutes a day making more than 55 million videochats [6]. Between 2016 and 2017, the number of videochats on Facebook's messenger app doubled to 17 billion [83].

Teens are a key part of this trend. Pew research reports that 59% of teens videochat with their friends and 7% videochat daily [43]. Teen-oriented videochat apps have recently gained wider adoption. Houseparty, a relatively new videochat app, has more than 20 million users who

collectively participated in more than half a billion video calls [7,89]. Last year, new videochat apps (e.g. Monkey, Cabana) enabled interaction with digital content during videochat. In addition, social media apps (e.g. Snapchat) added videochat features. Recent mobile videochat apps targeted to teens emphasize that they are a social space for casual group conversations (e.g. Bonfire), for groups co-watching videos (e.g. Cabana), and for playing games (e.g. Tribe). Millions of teens are videochatting with these mobile apps yet little is known about their current videochat practices.

This work aims to deepen our understanding of teen videochat practices in everyday life. Given the proliferation of apps that enable additional digital content during videochat, we pay special attention to multitasking during videochat. By multitasking, we mean engaging in two or more tasks or stimuli at the same time or almost at the same time. A prior study [17] found that teens do other activities while videochatting, but exactly how teens switch between activities while managing social interactions remains underexplored. During videochat, how do teenagers manage their digital and social interactions, and what kinds of challenges do they face?

Multitasking and videochat practices may reveal socio-technical 'boundaries' that have potential to be 'blurred' [39]. For example, social media enable the easy blending of private and public spaces when publicly sharing personal content. Chat applications merge social contexts, for example: simultaneous chats with an old friend and a boss. Communication technologies, especially when multitasking, can facilitate overlaps, switches and conflicts between temporal, spatial and social contexts. Similar to context collapse on social media where various contexts of individuals' lives are flattened into a single, homogeneous group (e.g. Facebook friends)[55,81], videochat may enable various contexts within the home and social environments to coexist and clash. This leads us to ask: how do teens encounter, manage and cope with such context switches?

We explored teens' videochat and related multitasking practices by conducting a diary study with 16 teen participants. Each teen participated in all three phases of the study: an initial in-lab interview, a two-week photo-diary of videochat use, and a final in-lab interview. This allowed us to collect screenshots of interaction and detailed stories around specific videochat sessions, and to explore these instances in more depth in the final interviews. This paper makes three major contributions:

- This research deepens understanding of the situated videochat practices of today's teenagers. We report why, where, and with whom the teens videochat. We describe how the teens collectively manage their experiences together over videochat. We highlight teens' social norms around paying attention and discuss what they did and did not perceive as interruptions during videochat.
- This research contributes to existing multitasking literature by exploring teens' use of various apps during videochat and revealing context and motivations for switching behaviors.
- This research provides design implications for technologies and services to support teenagers' videochat experiences. We examined the challenges that teens faced, such as an auditory context collapse between their peer and domestic settings, which informed the discussion of viable ways to support them in managing their multitasking during videochat.

2 RELATED WORK

In this section, we discuss the motivation for this work, as well as previous research that we build upon, within the following categories: video communication, teenagers' video communication, and multitasking.

2.1 Video Communication in Everyday Life

Video communication is studied in the fields of human computer interaction (HCI) and computer supported cooperative work (CSCW). The focus was initially geared towards video communication in the work setting (e.g. Mediaspace [9], NYNEX Portholes [40]). Research has indicated that video communication can improve task performance and help establish common ground for the collaborative work among the distributed teams in a workplace setting [16,20,53,54]. A recent wave of research has shifted away from the workplace to study how videochat creates shared experiences in personal and domestic settings [16,38,57,61,62].

Outside of the workplace, past videochat research focused on how videochat helps maintain or improve close relationships between one's family or friends. Brubaker et al. [16] found that after relocation, people sought co-presence with personal videochat to cope with distance among close relations. Zhou et al. [88] found that videochat affords more formal and deeper conversations with family members compared to text messages. Ames [2] found that videochat enables families to articulate and communicate their family values. Shared experience through videochat has become a key component of relationship maintenance to be used in one's daily activities. Neustaedter and Greenberg [61] studied how long distance couples "hang-out" remotely, and learned that videochat affords them a unique opportunity to share each other's presence over a long distance, which in turn provides intimacy. Macaranas et al. [51] studied how people watched media content together at a distance using Skype, while watching TV or streaming content. They found that people felt a stronger connection to the content and their friends at the same time.

A range of populations of videochat users have been studied (e.g., long distance couples [61], divorced families [86], and grandparents [37]). There is less understanding about the videochat practices of teenagers. Today's teens are one of the first cohorts to have Internet technology readily available at a young age [23]. Over the last six years, there have been three major studies that examined teenage videochat practices: in 2012 [42], 2013 [17], and 2015 [41]. We follow up their work to examine how videochat has evolved with today's technology. In the 2012-2015 studies, participants mostly used laptop or desktop computers, with a few starting to explore video on iPhones and iPads. Given the new cohort of teens, the penetration of smartphone ownership and use and the series of new apps targeting teen users, it is timely to deepen our understandings on their mobile videochat experiences to inform researchers, designers, practitioners, and parents.

2.1.1 Teenagers and Video Communication. When a new technology gets widely adopted, teenagers are often lead users, such as for Instant Messaging (IM)[30,78], the internet [26], video games [34], smart phones [74] and social media [11,69]. Understanding teens' appropriation of new technologies can point to future directions for research and design.

Today's teens use videochat (59%). They also use social media (71%), email (64%), videogames (52%) and instant messaging (79%)[41]. Teens do these activities while videochatting. In 2013 Buhler et al. [17] found that teens do many of the same activities over videochat that they do when hanging out in person, such as gossiping, flirting, sharing homework sessions, and "show-and-tell", where they show artifacts to one another, such as proof of accomplishments, new clothes, or photos of places. This leads us to ask, how are today's teens multitasking over videochat, if at all? How do they manage multiple activities, and how do they switch between various activities and contexts, all the while videochatting with their friends?

Today's teens have higher smartphone use than all past generations, 95% compared to 73% from a few years prior [59]. They engage with approximately nine hours of entertainment media per day. Social media is also an integral part of teenagers' lives with 45% using it every day [68]. Teenagers today have been living in a digitally connected world for as long as they can remember [72]. They engage in frequent multitasking which has been argued to create shorter attention spans compared to Millennials [72]. Given teens' unprecedented opportunities to multitask using

mobile apps, we anticipate that today's teens might multitask during videochat in different and perhaps more nuanced ways compared to other generations.

2.2 Multitasking and Interruptions

In this work we broadly define multitasking as engaging in two or more tasks or media concurrently or almost at the same time. Multitasking can be prompted externally from sources such as incoming notifications, or internally through self-interruptions [12]. One may interrupt oneself to escape a task that is overly stressful or one that is under-stimulating [87].

Different disciplines study multitasking with different foci. In the tradition of psychology, multitasking is often studied through its constituent components of cognitive control, which are basic information processes such as filtering, task switching and holding elements in working memory. Media multitasking scopes multitasking to interacting with media. Multitasking can also be conceptualized as a trait, where people can be categorized as chronically heavy or light multitaskers. Heavy media multitaskers were found to perform worse in cognitive control tasks [63] and to have worse memory capacity [80], though others have found that media multitasking is related to poor performance only when paired with low self-regulation ability [76]. Emotion and mood have also been related to multitasking. Media multitasking is associated to increased fatigue [15], depression [66] and anxiety [5]. In contrast, multitasking has also been found to satisfy emotional needs of feeling entertained or relaxed [4,82]. In education, multitasking is studied in classrooms or learning contexts and has generally been associated to negative effects on learning [10,44]. In previous decades, television was one of the main ways to multitask, and was found to impair homework performance [64] and toy play in younger children [71].

Experimental and field work in HCI finds the context of multitasking matters. Lottridge et al. [49] found that the performance of heavy media multitasking depended on distractors: when presented with irrelevant distractors, chronic multitaskers wrote worse quality essays but with relevant distractors, they wrote better essays. Mark et al. [52] found that college students feel less stressed when they switch to social media for entertainment but that the amount of multitasking is positively associated with stress and negatively with self-assessed productivity.

Within the CSCW community, researchers often focus on *in what ways* people engage in multiple tasks or technologies concurrently *with others*. Ames et al. [1] argues that the iPhone created the social expectation of constant connection that requires multitasking to achieve. As a result, users needed to form a techno-social pecking order of who gets interrupted or ignored. Buhler et al. [17] noted that teens did other activities while videochatting but did not focus on norms and perceptions around those activities. Mark et al. (2015) found that multitasking is like homeostasis: rote work was often followed by social media or face-to-face chatting and focused work was often followed by email. In a study of multitasking in a professional desktop video conferencing context, Marlow et al. [54] found that when multitasking on the same screen as the video conference, participants' split attention was less obvious compared to multitasking on a secondary screen or phone. Participants considered same-device multitasking as more polite and socially acceptable compared to other-device multitasking. We are curious about teens' etiquette for multitasking during videochat, especially since multitasking is becoming more prevalent for teenagers today [72] and more technologies enable teens to engage in multiple activities or media at the same time.

Our research extends Buhler's [17] by unpacking teens' multitasking during videochat. We aim to better understand teens' situated experiences and the social norms around multitasking during videochat. By situated, we mean that teens are constantly managing their videochat experiences moment-by-moment, doing as they do, guided by a felt experience of their situation and context [75].

Technology blurs temporal, spatial and social boundaries of daily life through: flexibility (ability to do activities in any place), multiplicity (choosing from different temporalities), ubiquity (ability to 'go' anywhere) and telepresence (replacing physical with virtual presence), among others [39]. Multitasking may facilitate separate contexts to overlap and switch. During videochat, teens may experience various context-switches in any number of ways, which is potentially positive and relieving, frustrating and disruptive, completely "normal," and simply awkward – teens' experiences of multitasking over videochat remain underexplored. When teens feel interrupted, what aspect of which experience is being disrupted? What has changed? If we gain insight into how teens incorporate and manage interruptions and multitasking to support their own needs, we can better understand how the design of videochat systems can support and shape user behavior.

3. METHODS

To explore teens' videochat practices, we recruited 16 teenage participants for a photo-diary study. They were all existing users of videochat applications, regularly videochatting with their friends at least a few times per week over the last month. 14 participants were recruited via Craigslist posts targeted to parents, and two through a posting to members of our broader organization for friends or extended family who might meet our criteria. Teens had diverse backgrounds in regards to their parents' occupations and came from 8 unique cities/suburbs that varied in terms of: distance to our institution (from 12 to 80 miles), size (from a population of 22,600 to 1.025 million), demographic makeup, and median household income (from approximately $45,000 to $103,000 as per ZIP code [84]) (see Table 1 in the Appendix for full participant demographics). Five males and 11 females participated, with an average age of 15 years. They used various mobile videochat apps including FaceTime, ooVoo, Skype, Houseparty, Snapchat, Cabana, and Facebook Messenger. Participants and the parents who brought them to the session were offered an incentive corresponding to the standard participant remuneration rate of our institution. Parental consent was obtained to participate in the study and our institution approved all study methods before the study began. At the close of the study, we asked parents their occupations, and noted detailed roles such as Uber driver, Walmart salesperson and university staff. In order to protect privacy, the authors report categorized occupations using the ISCO-08 scheme [36].

3.1 Data Collection

The study consisted of a 30-minute initial in-person interview, photo diaries describing videochat experiences for about two weeks, and a final 1-hour in-person interview. The data was collected during the summer of 2017, when most participants were on a school break. The diary study period lasted 16 days on average (based on the participants' availability for the final interview). Interviews were video-recorded and the audio was transcribed for analysis.

3.1 Initial Interview. The initial interviews were semi-structured with the aim to understand general videochat practices and to collect detailed recent examples. We asked participants about how often they videochat, how long videochats tend to last, whom they chat with, which apps they use, how often they used each one, and what they like or dislike about each app that they use. We then asked them to describe their most recent videochat by asking who it was with and what they did over videochat.

We used a back-and-forth approach to progressively elaborate on the terms 'multitasking' and 'interruption'. For each term, we shared a stem definition, after which we asked participants to share their own ideas of examples and own related experiences, noting them on sticky notes. Our stem definitions for multitasking were: first, "do[ing] other activities while chatting" then collecting participants' examples, and second, "perform[ing] and manag[ing] different kinds of activities concurrently or almost at the same time as you videochat" after which we collected

more examples, if anything additional came up. For interruptions, we asked for examples with simply the term itself: what memories they have of being interrupted during videochats. Then, we shared the definition "a change of attention" and collected more examples. We shared more extensive definitions of multitasking compared to interruptions because we anticipated teens would be less familiar with the term multitasking than with the term interruption. The goal of this approach was for participants to come away from the initial interviews with equivalent core understanding of the terms, solidified with their own examples and experiences. The interview concluded with an explanation of the photo-diary procedure.
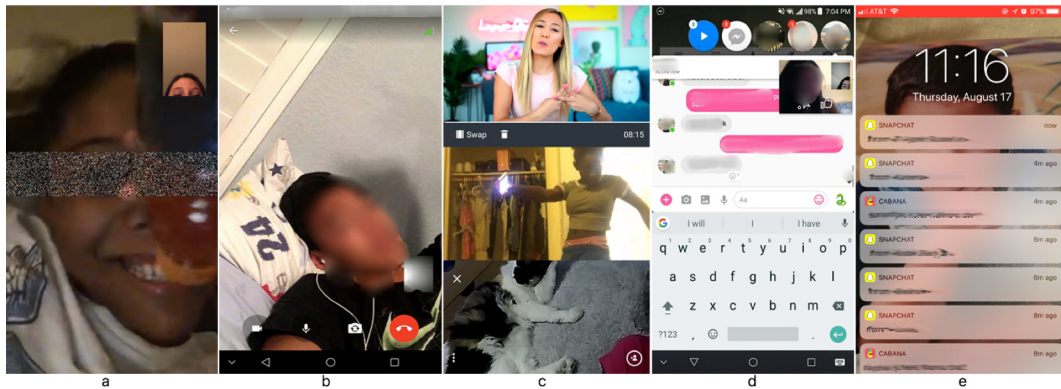
3.2 Photo Diary. For the diary study, we asked participants to take screenshots or photos and add a short caption any time they videochatted. They were not required to send any particular number of pictures, and if they did not videochat, it was fine to not send any. Screenshots and photos could include any object or situation that would help them remember the moment. We emphasized that photos did not need to be 'interesting' or 'aesthetic'. To protect the privacy of participants and their friends, we did not want to collect any unnecessary personally identifying information (e.g. friends' names and faces, or the contents in incoming notifications). We asked participants to blur that information using a blurring app before sharing the picture with us. In addition to the pictures, participants sent a short caption of how they videochatted and what happened during the chat. These provided a wealth of qualitative data and served as remembrance artifacts for detailed discussion of these incidents in the final interviews. This method has been used in previous studies [19,22].

3.3 Final Interview. Final interviews were conducted in-person and were also semi-structured. The interview protocol was focused on exploring participants' specific videochat experiences that occurred throughout the study period. Prior to each interview, we reviewed the pictures sent by participants. This created a unique list of topics to follow that pertain to each participant's pictures and captions. Upon arrival, participants reviewed all the pictures they had submitted, and selected ones to focus on in the final interviews. They then went through each picture describing the specific videochat experience by answering the questions such as "what were you doing?", "what happened?", and "how did you feel?". We also asked follow-up questions based on their answers to further explore each incident. If there were pictures that participants hadn't selected to discuss but that we were curious about, we asked participants if they were willing to talk about their experiences around them. The interviews concluded with a discussion of their perceptions of videochat including the overall benefits and downsides to using videochat in their lives.

3.2. Analysis

The data set included transcribed audio from the initial and final interviews, 203 pictures, and 236 item-level notes comprised of direct quotes from the initial interviews. We inductively reviewed, iterated, and finalized the themes, using participants' quotes as leaf nodes in analysis. After initial interviews, we conducted the preliminary analysis. One author and one research assistant read all the transcripts and sticky notes, and created affinity diagrams. The activities participants reported to perform on videochat included eating, exercise, moving around, homework, livestreaming, house chores, listening to music, sleeping, getting ready to go out, and playing games. The interruptions during their videochat included app notifications, incoming calls, background noise, friends doing other things, physical interruptions, and other tasks. This helped us to get a sense of what teens perceive as multitasking and interruptions, and guided our development of the final interview protocols.

After conducting the final interviews, the whole data set was re-analyzed following a thematic analysis approach [14]. Before analysis, one author reviewed and annotated the content of each picture such as its background, performed activity, and people etc. Then two authors read all data

a & b : Participants videochatted in the bedroom and their friends showed their close-up faces; c: A participant was dancing while watching Youtube video on app (the top screen) and her friend was hanging out her own dog at the same time; d: While videochatting with a friend, a participant talked to another friend using the messenger; e: During his videochat, a participant received lots of notifications from other social media.

Figure 1. The Example Pictures Teen Participants Shared for Photo Diary

and discussed it together, helping familiarize ourselves with the content. Then one author generated the 98 initial codes. Through a number of iterations and discussions, two authors created 10 themes (Level 1): the triggers for videochat, videochat for close friends, why videochat, locations of videochat, synchronized activities done together, synchronized activities done separately, physical invasion, when to pause, when to be paused, and interruptions on device. We then reviewed and discussed the themes again by collating all the relevant coded data extracts within the identified themes and sorting the various themes into the broader themes. We finally created four overarching themes (Level 2), reflecting the meanings of the data as a whole, and refined the names of themes, which are presented next in the Results section.

4 RESULTS

We unpack teens' videochat practices by the four themes that emerged from our data: 1) the context of videochat, 2) how teens engage in synchronous activities together and separately over videochat, 3) social norms around presence and 4) how interruptions are perceived.

4.1 The Context of Teens' Videochat: Why, with Whom and Where

We describe the context of teen's mobile videochat focusing on how they started videochatting, who they videochatted with and where their videochats occurred.

4.1.1 Motivation to Videochat: Need for Stimulation and Social Connection. Boredom and being alone arose as themes when participants described why they initiated videochat. P2 said, "I was home alone, so I called her, because I had nothing better to do. I was doing my hair and stuff and getting dressed while I was talking to her." When faced with "boring" tasks such as doing chores, teens started videochatting to make the experience more enjoyable. P13 videochatted when babysitting. P6 and P15 videochatted when doing laundry. P14 said, "I also FaceTime when I'm cleaning my room...if I'm bored while doing it, being on the phone or FaceTime with someone makes it better. It makes it go by faster." Describing herself as "bored all the time," P9 competed with her friends on videochat duration: "I have this thing with friends where we're like "Okay, let's try to set a new record for how long our calls can be." Participants were forthcoming in sharing that they felt bored, 'were alone' (though within a house with family members), and that videochat with a friend was a 'go-to' habit in these moments. Participants didn't speak about

boredom with any discernable value judgment. Boredom was discussed as if it were "normal", "natural", and relatively frequent.

4.1.2 Videochatting is Mostly Mundane Talk with Close Ties. Participants tended to videochat with those to whom they felt very close, including "best friends", "school friends", "old friends", and "family friends". Videochat was used mostly with friends they saw often in-person but also occasionally with those they did not. P11 reported that she often videochatted with her direct next-door neighbor. She followed up that her father thought it would take too long if she went to their house. Teens reported sharing the everyday aspects of their daily lives. P12 used the term "regular stuff" to describe her videochats: "We were just talking about regular stuff...Just, "How are you doing? What did you do today? How's your day?" Stuff like that." P10 believed that sharing the mundane was what best friends were supposed to do: "She's kinda like my little outlet because there's just like always a lot going on and I always want to talk to her. She always wants to talk to me." The videochat enabled "catching-up" (P7):

> I hadn't talked to him in a little while and we just FaceTimed for like five hours. He just showed me a whole bunch of stuff he's been doing. We caught up. Let each other know what we've been doing lately and how everything is going.

Participants occasionally used videochat with groups of friends using mobile apps such as Houseparty or ooVoo, but reported one-on-one as being what they did on a regular basis. Teens also reported who they didn't videochat with: "It's just you and them. It's more of a one-on-one conversation. I think FaceTime's more personal than going to see someone. 'Cause my soccer friends are like...I'm not gonna start videochatting them because to me they're my soccer friends, you know?" (P2). Thus we observed that teens used videochat with an intimate circle of close friends to share their everyday life.

4.1.3. The Where of Teen Videochat: Mostly the Bedroom and Anywhere Teens Go. Participants reported that they usually videochat in their own bedrooms, which is similar to the findings of Buhler [17]. More than half of photos we collected showed a bedroom in the background, with the teen sitting or lying on the bed, and about a half of pictures had the close-up faces/bodies either of participants or their friends, often filling up the majority of own screen (Figure 1). They continued their conversations while traversing their home–common spaces throughout the house such as laundry rooms (P15, P16), kitchens (P7, P9 and P11), and bathrooms (P2, P5). P2 explained how she 'set up' her phone for videochatting while brushing her teeth:

> There's like the tile in my bathroom and then the mirror, and I can kinda stick my phone through there so I could hold it up to like...It's like a camera prop almost. And I can hold it up and talk and brush my teeth or wash my face at the same time.

Teenagers also conduct their videochats "on the road", which can occur during transportation and any location they are visiting. While he was biking, P7 videochatted by holding his phone in one hand. P13 videochatted in the car when her mom was giving her a ride to her grandma's house. In many cases, videochat on the road was not started for a specific reason. It "just did not bother [me]" (P7), and described being on the road is part of their day. Teen videochat is primarily done where they are when they are "bored" and "alone." While not completely restricted to the home, it is only as restricted as the teen is in their ability to move throughout the world.

4.2 Interleaved Synchronous Activities during Videochat

As one would expect from videochat, teens spent time actively interacting. We were surprised at how they also spent long periods of time co-present yet not interacting, and rather focusing on activities other than speaking with their videochat partner(s).

4.2.1 Synchronous and Together Over Videochat. Participants engaged in various activities that required some or full synchronous engagement with each other, such as chatting about homework, playing games and discussing wins or progress in real time, getting feedback on (real life) shopping, co-listening to music, co-watching movies, and singing songs together. Videochat brought them together. P16: "If we can't all go meet at the same place to do something, we can feel like we still are because we are talking to each other on the same videochat." When engaging in synchronized activities over videochat, it mattered that these activities were perfectly synchronized. When watching movies together over videochat, P9 always pressed the play button at the same time with her friend: "We'll pick a movie that we want to watch...and we'll wait for it to load and we'll wait for it to buffer and then we'll be like "Okay. 3, 2, 1, play."" P10 explained that it felt more "real", similar to findings by Macaranas et al. [32]. When videochat was off-sync the moment of having fun together felt "ruined". While singing together over videochat by following a music video, P8 was irritated after she found that her friend was not singing the same part as her due to the delay:

> I didn't like when you watch a video like sometimes the video will be faster or slower on the other person's phone. Say we're listening to a song then I'll be on one part and another person will be ahead of me...I was singing the song with somebody and then I saw that.

Over videochat, teens emphasized moments when it was important to share the same experience at the same time.

4.2.2 Synchronous and Separate Over Videochat. Teens also shared many moments where they were not experiencing the same thing, but in fact actively pursuing their own individual activity. P5 ran on the treadmill while his friend was doing his part-time job; P11 arranged bookcases while her friend was doing homework; P6 watched a movie by herself while her friend was browsing Instagram. P10 played one game while his friend played another. While not actively interacting with each other or any shared media, teens have their friends co-present. P11 said, "a lot of times we don't even talk. We'll be there for company, you know. I'll be playing my ukulele or doing homework, and she'll be listening to music or cleaning her room or just lying there." Teens shared times when they wanted company while barely interacting or even being conscious–participants fell asleep over video (P4, P8, and P9) during the diary study, and most of these sessions lasted for several hours, with teens waking up during the night to check that the call was still active. For the most part, teens were able to easily flow between actively interacting together and separate activities. For example, there might be long lulls with spontaneous intermittent conversations. Here, each was focused on what they were doing but would every so often speak up. For example, P15 and his friend were scrolling their own Instagram feeds, and P4 exclaimed over a post on Instagram and asked her friend whether they had seen it too. P10 intermittently exclaimed success or failure while both friends were playing different videogames.

4.2.3 Motivations to Adjust Engagement With Each Other. Teens explained that what prompted engaging in a separate activity was feeling understimulated by the videochat. P8 noted that "It's kind of boring looking at just the face," so she spent almost half of her videochats scrolling other social media: "I'm so used to FaceTime it's like I always go on pause too because it's boring just looking at the same person...then I'll just go on another app like I'm not just going to sit here." We found that the open videochat was so comfortable and integrated into daily life such that it became unremarkable and teens forgot it was even there. P5 describes how he suddenly realized that he was on videochat when an additional friend joined it: "We didn't talk like ten minutes probably...I forgot I was on the call until I got like a notification of somebody else on the chat". P2 recounted how she surprised herself by sending a snap to the friend who she was videochatting with: "Sometimes we'll forget we're even on FaceTime. We'll be Snapchatting each other and be like, "Oh wait."" In this example, being on videochat and multitasking, P2 fell

into her habit of attending to all her unanswered snapchats to reply and keep her streaks[2]. When she realized it, she laughed and this flowed into a spontaneous interaction.

4.3 Social Norms during Videochat: It is OK to Pause or be Paused, Up to a Point

Teens told us that they frequently paused and "got paused" by friends during videochat. Note that not all videochat apps have a pause feature: Facebook Messenger does not and can be backgrounded without any indications to the videochat partner. FaceTime, which was used the most by participants (Table 1 in Appendix), automatically displays "Paused" when the app is backgrounded. Skype has an active pause feature. Note that when participants say they "got paused", it suggests agency in the pausing action which may not necessarily have been purposeful. By asking teens' feelings about and perceptions of the meaning of those moments, we begin to discern social norms of how teens manage flowing from active interaction to focusing on things other than the videochat.

4.3.1 Teens Pause to Control their Physical Auditory Environment. To control the video, teens used features such as pause, mute, camera-off, or actions such as turning the volume down or physically turning the phone camera to face downward. They reported using features or actions to "hide" physical or auditory "intrusions" caused most often by family members yelling or entering their bedrooms, and other noises such as a dog barking. P5 said, "she called me to do chores...she [mom] calls my name...so I put you on pause. And then, I'm gone for like 30 minutes to an hour." Here, pause (on Skype) was used as, and expected to be understood as, a signal 'wait for me to return.' For videochat apps where there was no specific in-app button to pause the chat, participants used mute or camera-off: "my dad walked into the room. And like, I muted my phone and turned off the camera" (P3). In the moment, this participant chose mute and no camera rather than ending the call or mixing her social contexts of home life and peers.

4.3.2 Teens Pause to Control their Virtual Auditory Environment. Several participants expressed the desire to be able to mute their friends. P3 remarked on the fact that she could not completely turn down the volume in her videochat app: "If my parents walk in and they hear her saying something really weird to me, they could still hear it 'cause I can't turn down the volume completely." To manage these situations, participants actually asked their friends: "Stop talking for a minute" (P11), or sent text messages to explain. In fact, P10 shared a "rule" that she has with her friends: when a friend spontaneously and suddenly stops the videochat, one shouldn't call back until they receive a text message.

4.3.3 Ambiguity and Mutuality in Pausing. Participants felt that they frequently "got paused". They assumed their friends had similar reasons as they did when they "paused" others: being physically interrupted or browsing other apps. They expressed compassion with regards to the necessity of it: "We're all really understanding because a lot of the times our parents don't want us to play games. If you get caught, then you'll hang up the call immediately, and you'll be, like, "Mom, I didn't mean to"" (P9). So they felt "it is fine" to "be paused" (P1). Following from the discussion of synchronicity in the previous section, if one pauses or reduces synchronicity, the other matches reciprocally. P8 followed what her friends did:

> They're on like Instagram...or something, they pause me and I just go on pause. And I do the same thing. So, it works out I guess. Yeah. Like evens it out. And but when they say they're back, then I'll come back.

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[2] A Snapstreak means two friends have 'snapped' each other (i.e., sent photos) within 24 hours for more than three consecutive days. Snapstreaks are rewarded with small icons and numbers reflecting the length of the streak. To keep a Snapstreak going, both Snapchatters must send a Snap (i.e., photo; a text chat doesn't 'count') back and forth to each other within a 24-hour window, which encourages teens to use Snapchat daily.

Sometimes participants paused or multitasked covertly.

> It's just like talk, talk, talk...That's why I'm always Facetiming her is because she talks so much...I'm just, "Mm-hmm. Mm-hmm." I look through and I can find a song. It's like, "Hear that? Listen to that. I need a break. Give me three minutes." She talks my ear off. But I love her to death, so it works. (P14)

Videochat on smartphones can afford ambiguity where one person can be more engaged while the other is less so, which help teens manage their 'boredom' by performing other activities without upsetting the others.

However, there were moments where expectations around politeness were violated. P10 recalled when her friend got mad at her when she was browsing social media: "he always gets mad whenever I'm on another app or I'll pause him to go on Instagram or YouTube...He'll be like, "Why do you pause me?" And then I'm just like, "What?"...I guess he gets mad." P9 recounted when she found her friend too involved in a video game while on videochat. She wanted his attention but was unable to make him engage with her. Her tactic was to stare at him for half an hour: "I kept staring at him. And he was, like, "Do you have nothing better to do?"...He didn't care because he was playing games." P10 developed her own tactic –saying "aight!" very loudly– to catch her friend's attention: "she's not paying attention, I'm like, "aight!" and she's like, "hmm?"...I'm like, "Why aren't you listening to me?"" Tension arose among friends when there is less mutual agreement of reciprocal social norms over videochat: "he didn't pay attention but he was listening, but he wasn't listening... I was like, "Why FaceTime me then?"" (P5). These teens expected that their videochat partner should be instantly or near-instantly available, and are upset when this expectation isn't met.

Shifts toward separate activities were negotiated some of the time, by various means. Sometimes teens would let the other know that they were intending to start a separate activity. During her videochat, P3 prepared her dinner, and started to eat with her family. She asked her friend to "wait" over the videochat, but found that her friend hung up the videocall. When we asked her how her feeling was, she said "oh, I was fine with it", and explained "I'll just ask him what he did later, and then he would tell me "oh, yeah, I went to dinner, too" and I'd be like, "okay"." This attention shift started with an explicit signal and then the teen checked in with the other. P3 describes this checking behavior in another example:

> We played games for like an hour, and then we were both tired. So he went to sleep, and then I went to sleep. He woke up and I was still sleeping, so he went to go eat dinner. He came back and I was still sleeping.

Attention was negotiated by matching, as in the pausing examples above, as well as by signaling or calling the other back to the videochat. We saw examples with explicit interactions to signal a change in attention (such as asking the other to wait (P3)) and others show one partner changing attention and the other matching without explicit signals (such as noticing the other is attending to something else on their phone and matching (P8)).

4.4 Interruptions During Videochat: "Mom" Interrupts, Notifications Do Not

4.4.1 Interruptions as Context Collapse in Videochat. Teens considered the physical "invasion" by family members into their bedrooms as the most common interruption that they faced, and also the most upsetting one. P14, recalled when her mom embarrassed her while she was videochatting with her male friend. "She was like..."I think I want to go shopping to Victoria's Secret...do you think you need to buy more?" I'm just like, "I'm on the phone, can you not do that right now?"" P9 felt a similar embarrassment from her mother: "If I don't mute fast enough and my mom says something like, "Have you pooped yet." My friend will laugh at me afterwards [Participant makes a sad face to the interviewer]". By entering the physical and audio space near

teens, these parents have effectively entered the videochat. They may be unaware altogether, or have different views on what is appropriate given the peer-to-peer context of videochat.

The acute blending of physical and virtual contexts collapsed their peer-to-peer and domestic 'audiences' in a similar manner as can occur on social media [55,56]. This presented nuanced privacy challenges that participants struggled to manage. Participants (P2, P7 and P11) said that their mom sometimes joined their videochat without any advance warning. P11 said, "My mom always tries to join in the conversation and stay, and I'm like "Mom, I love you, but not right now."" Parents entering the videochat may present a clash of 'child' and 'peer' identities: "I feel it's more lively when she's not there, because we scream more" (P11). P6 even "felt scared" when her mom walked in to 'check on' her, and she added "She likes to be dancing in my camera, or she talk to [friend] and stuff like...what I be doing, she'll try to do that. Kind of irritating..."

4.4.2 Digital Notifications Not Perceived as Interruptions. In contrast to physical interruptions, which teens reported were very disruptive, mobile notifications were not perceived to be disruptive. All our participants reported receiving "at least a few" notifications on their mobile devices per videochat. Teens reported that most notifications coming from social media or SMS (e.g. Instagram, Snapchat). One example is the last picture in Figure 1. In his 20 minutes videochat, P5 received more than ten notifications, which kept his mobile vibrating and blocked part of his screen during videochat. It is noteworthy that most participants explicitly said notifications were "fine". Teens felt that they could easily manage notifications – ignoring some and deciding which ones to open. Much less often, notifications were perceived as annoying and incoming audio-calls were cited as more disruptive. Participants liked to be able to readily act on notifications and multitask immediately. They were irritated when videochat apps did not support the usage of another application at the same time. P10 said, "When someone sends me something on Snapchat and I try to open it, like if it's a video or something, I can't hear them if I'm Facetiming on mobile." It even dissuaded them to use the application: "If you swipe out and you try to go talk to other people, it'll drop the call, which is really annoying. So, I don't like using Snapchat" (P9). Being able to multitask during videochat was very important for our teens.

5   DISCUSSION

In this work, we explored teens' mobile videochat experiences through a 2-week, in-depth multimedia diary study with 16 teens. We observed four major patterns in how they videochatted. First, teen participants turned to videochat for stimulation seeking and social motivations, most often videochatting about everyday life with best friends from their bedrooms. Second, most videochats flowed in and out of synchronous conversation together and separate activities, such as each quietly scrolling through their own Instagram feed with the videochat in the background available for spontaneous conversation. Third, expectations and tensions around pausing revealed social norms around social presence – reciprocal and short-lived lack of attention was acceptable, but longer and unrequited requests for attention were met with dismay. Lastly, digital notifications were not perceived as interruptions yet physical and auditory interruptions from the home felt disruptive with the context overlap and collapse of the peer and domestic environments.

5.1 Mobile Videochat's Virtual and Physical Contexts

Videochat was a key part of our participants' lives; it was listed as the most frequent and favorite way of communicating with friends: "[videochat]'s something that I basically need." (P8). This differs from Buhler et al.,[17] who noted in 2012 that videochat was not the most preferred communication technology for teens. The increase in videochat may be due to advances in technology over the last 5 years and increased penetration of smartphones for teens [72].

Teens were explicit that videochat was thought of as inappropriate for less close friendships. The intimacy of videochat may be afforded by the mobile form factor in several ways. First, having a videochat conversation is not a disembodied experience, but rather teens conversed from their beds. Second, the mobile form factor could feel more personal because of the size of the face on the screen. When a face takes a large proportion of the screen, even a small screen, our brains perceive it as the equivalent of being physically closer [65]. Many of the pictures we collected had close-up faces, and perhaps it explains why they associated the mobile videochat for more intimate relationships.

At times, the virtual and physical context of the mobile videochat was violated. In particular, the often cited "mom intrusion" example points to the overlapping audio space as the most frequent and irritating interruption. As technology enables temporal and spatial flexibility [39], peer to peer videochats were initiated in the bedroom during all times of the day from the early morning to the middle of the night. This flexibility caused tension when spatial, temporal, audio and visual spaces of physical and virtual contexts collided—the mothers in the example might not acknowledge that there was an overlapping virtual audio space in their teen child's bedroom. Another contributor to disruptiveness may be accountability combined with immediacy. Interruptions from parents may carry expectations to respond immediately, which forces a decision to comply and disrupt the videochat, or to not comply. Accountability is not straightforward as teens are accountable to some degree for digital notifications (e.g. Snapstreak). Moreover, social expectations for responsiveness differ between communication channels, such as SMS versus WhatsApp [21].

Participants 'hung out' via videochat with their friends anytime–including early morning or after midnight, at times that it may be unusual to hang out with friends in person. The bedroom location and certain timing of videochat may have fostered parent-teen conflict, as parents attempt to manage perceived violations of the 'moral order' of the home, in other words, behaviors not considered appropriate given the time, place, and their own family traditions [33]. This may contribute to teens perceptions of the parents' interruptions as obtrusive. If teens feel that videochats challenge their family's moral order, when a parent unexpectedly finds out about it, teens' may feel caught in the act of a transgression.

In contrast, teens' felt experience of a steady stream of incoming notifications from all different kinds of applications on the device was that, surprisingly, they were not disruptive. These notifications remained within the virtual interaction space and thus may not disrupt as much as the reverse context collision, such as an audio notification interrupting a face-to-face interaction. On the other hand, young adults may underestimate the cost of switching attention and in fact those that multitask the most feel that they are the most effective at it, while also having the worst cognitive performance [63].

5.2. Adolescents as Lead Users for Social Needs

In our study, videochats were often initiated by boredom, desire for company, and loneliness. The social motivations were similar to motivations for how teens livestreamed to their immediate social network, where teens were found to score higher on a factor that included questions 'I livestreamed because I was bored.' and 'I livestreamed because I was lonely [48], compared to adults. Over videochat, our teens were motivated to actively engage with each other and were also motivated to maintain a connection without actively engaging with each other. In some cases, videochat became unremarkable and unintentionally faded into the background. In other cases, teens transitioned to a passive co-presence, where they intentionally maintained an open videochat connection while doing separate activities. Teens took advantage of the immediacy of the videochat connection to start spontaneous intermittent conversations. Teens used videochat to share everyday life and maintain closeness with close friends in similar ways as long-distance couples [61]. Other work on long-distance couples [50] found contacted the partner during 'empty

moments' of life, suggesting that a mediated connection can be a 'go to' habit in under stimulating moments. In that study, couples who had previously lived together had more appreciation for the passive co-presence of co-listening to music over an open audio channel of blended background sounds compared to those who had not previously lived together.

Support for co-presence has deep roots in CSCW. The Porthole project at Xerox Parc connected remote physical offices through shared still-images from video feeds, which increased informal interactions, spontaneous connections, and the development of shared cultures [25]. Our participants engaged in easy, spontaneous, and informal interactions that occurred while being co-present over videochat. The patterns of engagement of interacting synchronously together and separate found in our research echoes the continuous-sporadic usage style of teenage instant message (IM) in Grinter et al.'s study [30]. The teens in that study had IM software running for days or weeks while our teens videochat for at most several hours. This is certainly due to the richness of video, and also may in part be due to technological limitations as some of our participants perceived videochat as draining their batteries. There are parallels to other channels, and our teens had options to communicate and be co-present over IM but chose videocast. When asked why videochat instead of an audio call, our participants emphasized the richness and immediacy of the interaction: "it's [videochat] like as close as it can get hanging out" (P11), "It's almost like a real conversation face to face thing" (P15). P3 also explained how she liked to use videochat to watch a movie with her friend: "[If that was audio], you cannot see if they're scared or anything...you wouldn't be able to see hugging pillows and crying, you'd just be able to hear sniffling."

Taylor and Harper [78] found that co-located teens often shared and exchanged their phones and digital phone contents, like a "show-and-tell"[17], sharing emotional experiences and exchanging objects of personal significance to maintain closeness and intimacy. A rich conversation over shared digital artifacts is what new videochat apps promise to make possible. We observed strong reciprocity for attention and conversational engagement over videochat but our participants did not share many links, photos or other digital artifacts with each other. During the diary study period, some participants misused or forgot about sharing features –usability issues may have gotten in the way of artifact sharing. We found that attention was strongly reciprocated, which is suggested to be an implicit component of gifts in some gift-giving frameworks [73].

Our participants used videochat for fun and social relationship maintenance. This was likely influenced by the holiday from school as they may not see their friends as often and do not have homework. Many of the videochats were reported to last for several hours in the evenings similar to how friends might spend evenings at each other's houses. Teens may turn to videochat as they may have less opportunity to engage in face to face interaction in the current cultural climate of helicopter parenting [46].

Teens may be considered one of the lead user groups for videochat because of social needs related to developmental processes. According to developmental psychology [70,77], in early adolescence teens seek social affiliation to establish the basis of their own identity. This is theorized as related to adolescents' high desire for social approval from peers [70]. The developmental stage of late adolescence is to seek to differentiate from a peer group to further establish their identity. Throughout this process, they may make categorizations between an ingroup and an outgroup along a series of dimensions, which has been observed through teen ingroup-favoring behaviors [77]. Paying attention to the wording that participants used, it is possible that they referred to their own in-and outgroups (e.g. friends vs. "soccer friends"(P2)). The intimate interactions on videochat may enable teens to socially validate themselves.

Identity [27] is another way to understand the tension that arose when teens' physical and audio spaces were interrupted by family. Teens were engaging as peers over videochat, but it

appeared that they tended to be treated as children by parents or family members when they interrupted. The unwelcome collision of identities is the teens' experience of videochat context collapse, not to mention a momentary failure of impression management. Prior research finds that differences in parents' and teens' values for safety, trust, and privacy have been found to cause tension [24]. An interview study with parent-teen or -preteen pairs found that parents underestimate their children's technology use and that both parents and children have poor adherence to household technology rules, both of which cause additional tension [8]. Controlling 'who gets to look' is a key aspect when managing personal privacy in physically shared places [79]. In our study, teens were not able to actively maintain their privacy as interruptions felt uncomfortable. Compared to these, digital notifications did not feel like interruptions, which we discuss next.

5.3. Leisure Multitasking over Videochat

Multitasking was included as an initial focus of this work because new videochat apps emphasize mixing digital content and videochatting, and little is known on how teens might manage this along with other multitasking and interruptions. Our study unpacked teens' multitasking practices during videochat to help better understand why and how teens multitask in a broad videochat context. This extends previous work that focused how teens multitask when they study [58]. As our diary study occurred over holidays from school, we offer a snapshot of teen videochatting outside of the school year. During initial interviews our participants shared examples of multitasking with homework, but most did not engage with homework during the diary study period (as they were on break). The timing of the study limits the generalizability of our study to holiday months as participants indicated homework was a strong motivator for videochat over the schoolyear. Seeing how multitasking behaviors play out with the addition of regular homework is left to future work.

Teens' multitasking during videochat provides insight on the use of leisure multitasking to *increase* stimulation in contrast to work-framed multitasking which might be used to *reduce* cognitive load [87]. Teens relieve boredom and meet their desire for company through videochat. Their mundane conversation may run its course, or they may habituate to the presence of the other. This can lead them to feel under-stimulated, prompting them to seek more stimulation through multitasking.

Multitasking over videochat on mobile impacted the ambiguity of the focus of the user's attention. Similar to Marlow et al., [54], we found that multitasking on the same device "appears less inappropriate" compared to a second screen or device. When teens were actively synched and speaking with each other, this included the experience of the partner looking at them. Cues for attention in videochat may differ from traditional 'eye-contact' because of the placement of the device's camera vis-à-vis the display. If one can see the partner gazing toward them, it is assumed that they are paying attention. If one can see the partner gazing at another laptop, monitor or phone, this clearly indicates their attention is elsewhere. Participants in Marlow's study found that this broke accepted etiquette "then she started looking at her phone and not really listening. She was kind of rude". Thus, multitasking on the same-device, where the partner's gaze appears to be directed at the screen, was ambiguous for interpreting the partner's focus attention, whereas multitasking on another device was not.

In our study, teens performed ambiguous (hidden) multitasking when the other person was "boring", and but they also multitasked 'obviously' in various ways. As described above, they may gaze at a second device. This occurred infrequently. When teens multitasked on the same device, sometimes it was ambiguous, and some videochat applications displayed a 'paused' status. When seeing a pause, teens tended to casually turn to separate activities while "waiting" for their partner to return. A videochat partner can take the pause as a signal to reduce the amount of attention paid to the videochat, thus maintaining mutuality. In particular, teens expected reciprocity while

together, when engaging with each other and engaging in secondary media. When mutuality broke down and one partner wanted more engagement than the other was willing to give, participants were frustrated.

The comfort to multitask during social interactions with another may relate to their level of closeness and intimacy. Researchers who studied multitasking between couples with different level of intimacy found that one's own multitasking was unrelated to intimacy, but the more intimate the couple, the less they believed that their partner multitasked [3]. Another study logged app switches and characterized 'intimacy' by time of day, where night hours were most intimate, and found that there were more app switches during intimate times[32]. Our teens tended to videochat with "best friends," which means may've felt more comfortable multitasking within the social interactions for those relationships. We saw some indications of different behaviors across genders, such as boys playing video games more often, and girls having on average longer videochat sessions, however only about one third of our participants were boys so gender differences are left for future research.

6. IMPLICATIONS FOR DESIGN

We discuss opportunities for the design of future videochat apps and services for teens. Our design implications are not prescriptive. We discuss ways to enable and prevent multitasking, as designers may want to support multitasking in some cases and not others. We discuss both approaches based on our findings.

6.1 Supporting Multitasking during Videochat

It is important that designers note that they have power to influence multitasking behavior through technology design (e.g. [13,47]). During videochat, our participants often put the videochat app 'in the background' and moved to other apps (e.g. social media), and back and forth numerous times. If videochat apps do not drop the call when backgrounded, this enables users to navigate and consume different apps flexibly. If audio continues while the app is backgrounded, teens will spontaneously converse while engaging with other apps. When there are incoming phone calls, some apps drop videochats and others do not. If designers desire to support multitasking, one way to do so is to minimize the videochat in a small floating, movable window when switching to other applications. To support synchronicity, screen-sharing should be made more straightforward so that users could browse media together while on the call. There may be times when designers wish to discourage multitasking, which are discussed in the next section.

Another situation that teens need to deal with several things at once is during "intrusions" of family members. These overlapping audio spaces were frustrating. Designers can help teens manage these by enabling them to mute themselves, mute their friends, or to turn the volume down completely, facilitating quick context switches and preventing context collapse. Designers could also design to support parental awareness or mutual awareness of multitasking and videochatting. A recent analysis of apps [85] found more parental control features, such as monitoring, restriction, and active mediation, compared to teen self-regulation features, such as self-monitoring, impulse control, and risk-coping. Videochat apps could support parental awareness by showing teens on or off videochat status, or overall usage of videochatting or amount of multitasking. These features could enable parents to monitor overall use as well as give context when parents need to get the attention of the teen, such as giving them a choice to signal the teen without the videochat partner being aware. Videochat apps could support teens' awareness by letting teens know their own usage statistics and letting them know when their parents check their statistics or videochat status. Families should have the ability to opt-in to subset of features, with flexibility to change settings over time or under specific circumstances.

These features may promote teen-parent mutual awareness, communication and disclosures but may also bring unintended consequences, such as surveillance by third parties. Additionally, teens may develop "parental management strategies" in response to surveillance [29].

6.2 Improve Support for Boredom

Teens start videochats to seek social interaction and relieve boredom, yet still feel understimulated while on videocalls. Videochat apps can provide additional features and content to increase stimulation. Face-filters are currently popular and serve this purpose. Other engaging features could include audio-filters, video-filters, mobile games, co-watching video or other augmented reality components (e.g. demo of social and shared VR platform by the TNO [31]).

Another approach to supporting boredom is to support teens in learning to recognize and productively deal with boredom, which may be beneficial for development [18]. Boredom may provide motivation for creative thinking at opportune moments. Boredom-coping skills have been characterized in an educational context. A cognitive-approach strategy, such as thinking about and finding value in the current stimulus, was found as more beneficial for learning compared to behavioral-avoidance behaviors, such as talking to friends [60]. We suggest designing to support the development of cognitive-approach boredom-coping strategies rather than behavioral-avoidance, which could be construed as the ability to easily switch behaviors, i.e., multitask. An app design could discourage multitasking by disabling or slowing down when the user backgrounds the app. A design could encourage users to think through the value of their current interaction by including reminiscence images of previous videochats or other representations of friendship. A design could encourage users to interact in such a way to increase their own interest in the interaction, for example: pinning notes, images or cropped screenshots of things they love to the videochat, to discuss with their partner. This functionality is already available in some videochat apps but not well-utilized. The moment that the user attempts to background the videochat could be an opportunity to visually remind the user of this functionality within the app. The videochat app could encourage teens to find creative solutions to boredom and ways to collaborate with friends on games or projects [67]. For example: the chat application could display creative tools or give options for the user to collaboratively track progress towards personal goals to hold each other accountable, and work towards these goals together over a distance. Videochat could also be integrated into tools for collaboratively working on homework with groups, such as Google Drive on a tablet or laptop. Designers could support focused conversation or homework in a manner similar to a Snapstreaks, where streaks of uninterrupted minutes are rewarded with emojis, stickers, or a later curfew for videochat. Recent work has found that mindfulness training can mitigate the impulses that propel multitasking [28,45]. In the future, we are interested in incorporating elements of mindfulness in our designs to observe the effects on stimulation seeking and multitasking.

7. CONCLUSION

We presented the results of a diary study on teens' videochat experiences in order to better understand with whom, how and why teens videochat. We found that teens videochat with their closest friends, most often from their bedrooms, because of boredom, desire for company, and loneliness. We found that teens flowed between activities done together, like chatting, or apart, like scrolling social media, as they shifted to multitasking and back to videochat. We uncovered tensions when teens paused or stopped videochat and how they do and don't manage it. Auditory and family intrusions are a frustrating form of context collapse, while most mobile notifications are not perceived as interruptions. This research on multitasking during videochat sheds light on how teens manage context-switches and attention during social and media interactions, and suggests videochat design opportunities to better support teens.

REFERENCES

[1] Morgan G. Ames. 2013. Managing mobile multitasking. In *Proceedings of the Conference on Computer Supported Cooperative Work*, 1487. DOI: https://doi.org/10.1145/2441776.2441945

[2] Morgan G. Ames, Janet Go, Joseph "Jofish" Kaye, and Mirjana Spasojevic. 2010. Making love in the network closet. In *Proceedings of the Conference on Computer Supported Cooperative Work*, 145. DOI: https://doi.org/10.1145/1718918.1718946

[3] Yair Amichai-Hamburger and Shir Etgar. 2016. Intimacy and smartphone multitasking—A new oxymoron? *Psychological Reports*, 119, 826–838. DOI: https://doi.org/10.1177/0033294116662658

[4] Olga Bachmann, Carola Grunschel, and Stefan Fries. 2018. Multitasking and feeling good? Autonomy of additional activities predicts affect. *Journal of Happiness Studies*, 1–20. DOI: https://doi.org/10.1007/s10902-018-9973-3

[5] Mark W. Becker, Reem Alzahabi, and Christopher J. Hopwood. 2013. Media multitasking is associated with symptoms of depression and social anxiety. *Cyberpsychology, Behavior, and Social Networking*, 16, 2, 132–135. DOI: https://doi.org/10.1089/cyber.2012.0291

[6] Karissa Bell. 2017. WhatsApp is totally dominating video calling, too. *Mashable.* Retrieved April 1, 2018 from https://mashable.com/2017/05/08/whatsapp-video-calling-stats/#QFPGzd0d75q2

[7] Karissa Bell. 2017. The video chat app that should scare the hell out of Facebook and Snapchat. *Mashable.* Retrieved July 4, 2018 from https://mashable.com/2017/09/07/houseparty-versus-facebook-snapchat/

[8] Lindsay Blackwell, Emma Gardiner, and Sarita Schoenebeck. 2016. Managing expectations: Technology tensions among parents and teens. In *Proceedings of the Conference on Computer Supported Cooperative Work & Social Computing*, 1388–1399. DOI: https://doi.org/10.1145/2818048.2819928

[9] Sara A. Bly, Steve R. Harrison, and Susan Irwin. 1993. Media spaces: bringing people together in a video, audio, and computing environment. *Communications of the ACM*, 36, 1, 28–46. DOI: https://doi.org/10.1145/151233.151235

[10] Laura L. Bowman, Laura E. Levine, Bradley M. Waite, and Michael Gendron. 2010. Can students really multitask? An experimental study of instant messaging while reading. *Computers and Education*, 54, 4, 927–931. DOI: https://doi.org/10.1016/j.compedu.2009.09.024

[11] Danah boyd. 2007. Why youth (heart) social network sites: The role of networked publics in teenage social life. In *MacArthur Foundation Series on Digital Learning – Youth, Identity, and Digital Media*, 1–26. DOI: https://doi.org/10.1162/dmal.9780262524834.119

[12] S. Adam Brasel and James Gips. 2011. Media multitasking behavior: Concurrent television and computer usage. *Cyberpsychology, Behavior, and Social Networking*, 14, 9, 527–534. DOI: https://doi.org/10.1089/cyber.2010.0350

[13] S. Adam Brasel and James Gips. 2017. Media multitasking: How visual cues affect switching behavior. *Computers in Human Behavior*, 77, 258–265. DOI: https://doi.org/10.1016/j.chb.2017.08.042

[14] V. Braun and V. Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101. DOI: https://doi.org/10.1191/1478088706qp063oa

[15] Laura F. Bright, Susan Bardi Kleiser, and Stacy Landreth Grau. 2015. Too much facebook? An exploratory examination of social media fatigue. *Computers in Human Behavior*, 44, 148–155. DOI: https://doi.org/10.1016/j.chb.2014.11.048

[16] Jed R. Brubaker, Gina Venolia, and John C. Tang. 2012. Focusing on shared experiences: Moving beyond the camera in video communication. In *Proceedings of the Designing Interactive Systems Conference*, 96–105. DOI: https://doi.org/10.1145/2317956.2317973

[17] Tatiana Buhler, Carman Neustaedter, and Serena Hillman. 2013. How and why teenagers use video chat. In *Proceedings of the Conference on Computer Supported Cooperative Work*, 10. DOI: https://doi.org/10.1145/2441776.2441861

[18] Linda L. Caldwell, Nancy Darling, Laura L. Payne, and Bonnie Dowdy. 1999. " Why are you bored?": An examination of psychological and social control causes of boredom among adolescents. *Journal of Leisure Research*, 31, 2, 103–121. DOI: https://doi.org/10.1080/00222216.1999.11949853

[19] Scott Carter and Jennifer Mankoff. 2005. When participants do the capturing. In *Proceedings of the Conference on Human Factors in Computing Systems*, 899. DOI: https://doi.org/10.1145/1054972.1055098

[20]   Lisa Childers, Terry Disz, Robert Olson, Michael E. Papka, Rick Stevens, and Tushar Udeshi. 2000. Access grid: Immersive group-to-group collaborative visualization. *Access,* 9.

[21]   Karen Church and Rodrigo de Oliveira. 2013. What's up with WhatsApp?: Comparing mobile instant messaging behaviors with traditional SMS. In *International Conference on Human-Computer Interaction with Mobile Devices and Services,* 352–361. DOI: https://doi.org/10.1145/2493190.2493225

[22]   Sunny Consolvo, Frank R. Bentley, Eric B. Hekler, and Sayali S. Phatak. 2017. Mobile User Research: A Practical Guide. *Synthesis Lectures on Mobile and Pervasive Computing,* 9, 1, i-195.

[23]   Forbes Business Development Council *(n.d.).* 2018. 13 Strategies For Marketing To Generation Z. *Forbes.* Retrieved April 10, 2018 from https://www.forbes.com/sites/forbesbusinessdevelopmentcouncil/2018/02/22/13-strategies-for-marketing-to-generation-z/#2f321c2331c3

[24]   Alexei Czeskis, Ivayla Dermendjieva, Hussein Yapit, Alan Borning, Batya Friedman, Brian Gill, and Tadayoshi Kohno. 2010. Parenting from the pocket: value tensions and technical directions for secure and private parent-teen mobile safety. In *Proceedings of the Symposium on Usable Privacy and Security,* 1–15. DOI: https://doi.org/http://doi.acm.org/10.1145/1837110.1837130

[25]   Paul Dourish and Sarah Bly. 1992. Portholes: Supporting awareness in a distributed group. In *Proceedings of the Conference on Human Factors in Computing Systems,* 49, 2, 541–547. DOI: https://doi.org/10.1145/142750.142982

[26]   Carrie La Ferle, Steven M. Edwards, and Wei Na Lee. 2000. Teens' use of traditional media and the internet. *Journal of Advertising Research 40,* 3, 55–65. DOI: https://doi.org/10.2501/JAR-40-3-55-65

[27]   Giddens, Anthony, Mitchell Duneier, and Richard P. Appelbaum. 2003. *Introduction to Sociology.* New York: W. W Norton & Company.

[28]   Thomas E. Gorman and C. Shawn Green. 2016. Short-term mindfulness intervention reduces the negative attentional effects associated with heavy media multitasking. *Scientific Reports,* 6. DOI: https://doi.org/10.1038/srep24542

[29]   Nicola Green. 2002. Who's watching whom? Monitoring and accountability in mobile relations. In *Wireless World.* Springer, 32–45. DOI: https://doi.org/10.1007/978-1-4471-0665-4_3

[30]   Rebecca E. Grinter and Leysia Palen. 2002. Instant messaging in teen life. In *Proceedings of the Conference on Computer Supported Cooperative Work,* 21. DOI: https://doi.org/10.1145/587078.587082

[31]   Simon N. B. Gunkel, Martin Prins, Hans Stokking, and Omar Niamut. 2017. Social VR platform: Building 360-degree shared VR Sspaces. In *Adjunct Publication of the International Conference on Interactive Experiences for TV and Online Video,* 83–84.

[32]   Mattia Gustarini and Katarzyna Wac. 2014. Smartphone interactions change for different intimacy contexts. In *Mobile Computing, Applications, and Services,* 72–89. DOI: https://doi.org/10.1007/978-3-319-05452-0_6

[33]   Richard Harper. 2006. Inside the Smart Home. *Springer Science & Business Media.*

[34]   Peter Holtz and Markus Appel. 2011. Internet use and video gaming predict problem behavior in early adolescence. *Journal of Adolescence,* 34, 1, 49–58. DOI: https://doi.org/10.1016/j.adolescence.2010.02.004

[35]   Connected Intelligence *(n.d.).* 2016. Application & Convergence Report. Retrieved July 4, 2018 from https://www.npd.com/wps/portal/npd/us/news/press-releases/2016/52-percent-of-millennial-smartphone-owners-use-their-device-for-video-calling-according-to-the-npd-group/

[36]   International Labour Organization *(n.d.).* The International Standard Classification of Occupations (ISCO). Retrieved April 18, 2018 from http://www.ilo.org/public/english/bureau/stat/isco/index.htm

[37]   Tejinder K. Judge and Carman Neustaedter. 2010. Sharing conversation and sharing life. In *Proceedings of the Conference on Human Factors in Computing Systems,* 655. DOI: https://doi.org/10.1145/1753326.1753422

[38]   David S. Kirk, Abigail Sellen, and Xiang Cao. 2010. Home video communication. In *Proceedings of the Conference on Computer Supported Cooperative Work,* 135. DOI: https://doi.org/10.1145/1718918.1718945

[39]   Michel Laguerre. 2004. Virtual Time. *Information, Communication & Society,* 7, 2, 223–247. DOI: https://doi.org/10.1080/1369118042000232666

[40]   Alison Lee, Andreas Girgensohn, and Kevin Schlueter. 1997. NYNEX portholes: Initial user reactions and redesign implications. In *Proceedings of the International Conference on Supporting Group Work,* 385–394. DOI: https://doi.org/http://doi.acm.org/10.1145/266838.267359

[41] Amada Lenhart. 2015. Teens, social media & technology overview. *Pew Research Center*, 7–10. Retrieved July 4, 2018 from http://www.pewinternet.org/2015/04/09/teens-social-media-technology-2015/

[42] Amanda Lenhart. 2012. Teens & online video. *Pew Research Center*, 3, 1–13. Retrieved July 4, 2018 from http://www.pewinternet.org/files/old-media//Files/Reports/2012/PIP_Teens_and_online_video.pdf%5Cnhttp://pewinternet.org/Reports/2012/Teens-and-online-video.aspx

[43] Amanda Lenhart. 2015. Teens, technology and friendships. *Pew Research Center*. Retrieved April 10, 2018 from http://www.pewinternet.org/2015/08/06/teens-technology-and-friendships/

[44] Andrew Lepp, Jacob E. Barkley, and Aryn C. Karpinski. 2014. The relationship between cell phone use, academic performance, anxiety, and Satisfaction with Life in college students. *Computers in Human Behavior*, 31, 1, 343–350. DOI: https://doi.org/10.1016/j.chb.2013.10.049

[45] David M. Levy, Jacob O. Wobbrock, Alfred W. Kaszniak, and Marilyn Ostergren. 2012. The Effects of mindfulness meditation training on multitasking in a high-stress information environment. *Graphics Interface*, 45–52. DOI: https://doi.org/10.1145/1979742.1979862

[46] Judith Y. Locke, Marilyn A. Campbell, and David Kavanagh. 2012. Can a parent do too much for their child? An examination by parenting professionals of the concept of overparenting. *Australian Journal of Guidance and Counselling*, 22, 2, 249–265. DOI: https://doi.org/10.1017/jgc.2012.29

[47] Danielle Lottridge, Eli Marschner, Ellen Wang, Maria Romanovsky, Clifford Nass. 2012. Browser design impacts multitasking. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56, 1, 1957–1961. DOI: https://doi.org/10.1177/1071181312561289

[48] Danielle Lottridge, Frank Bentley, Matt Wheeler, Jason Lee, Janet Cheung, Katherine Ong, and Cristy Rowley. 2017. Third-Wave Livestreaming: Teens' Long Form Selfie. In *Proceedings of the International Conference on Human-Computer Interaction with Mobile Devices and Services*, 20. DOI: https://doi.org/10.1145/3098279.3098540

[49] Danielle Lottridge, Christine Rosakranse, Catherine S. Oh, Sean J. Westwood, Katherine A. Baldoni, Abrey S. Mann, and Clifford I Nass. 2015. The Effects of Chronic Multitasking on Analytical Writing. In *Proceedings of the Conference on Human Factors in Computing Systems*, 1, 2967–2970. DOI: https://doi.org/10.1145/2702123.2702367

[50] Danielle Lottridge, Nicolas Masson, and Wendy Mackay. 2009. Sharing empty moments: design for remote couples. In *Proceedings of the Conference on Human Factors in Computing Systems*, 2329–2338. DOI: https://doi.org/10.1145/1518701.1519058

[51] Anna MacAranas, Gina Venolia, Kori Inkpen, and John Tang. 2013. Sharing experiences over video: Watching video programs together at a distance. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 73–90. DOI: https://doi.org/10.1007/978-3-642-40498-6_5

[52] Gloria Mark, Yiran Wang, and Melissa Niiya. 2014. Stress and multitasking in everyday college life. In *Proceedings of the Conference on Human Factors in Computing Systems*, 41–50. DOI: https://doi.org/10.1145/2556288.2557361

[53] Jennifer Marlow, Scott A. Carter, Nathaniel Good, and Jung-Wei Chen. 2016. Beyond talking heads: Multimedia artifact creation, use, and sharing in distributed meetings. In *Proceedings of the Conference on Computer Supported Cooperative Work & Social Computing*, 1701–1713. DOI: https://doi.org/10.1145/2818048.2819958

[54] Jennifer Marlow, Eveline van Everdingen, and Daniel Avrahami. 2016. Taking notes or playing games? Understanding multitasking in video communication. In *Proceedings of the Conference on Computer Supported Cooperative Work & Social Computing*, 1724–1735. DOI: https://doi.org/10.1145/2818048.2819975

[55] Alice E. Marwick and Danah boyd. 2011. I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society*, 13, 1, 114–133.

[56] Alice E. Marwick and Danah boyd. 2014. Networked privacy: How teenagers negotiate context in social media. *New Media & Society*, 16, 7, 1051–1067.

[57] Michael Massimi and Carman Neustaedter. 2014. Moving from talking heads to newlyweds. In *Proceedings of the Conference on Designing Interactive Systems*, 43–52. DOI: https://doi.org/10.1145/2598510.2598570

[58]   Kaitlyn E. May and Anastasia D. Elder. 2018. Efficient, helpful, or distracting? A literature review of media multitasking in relation to academic performance. *International Journal of Educational Technology in Higher Education,* 15. DOI: https://doi.org/10.1186/s41239-018-0096-z

[59]   Anderson Monica and Jiang Jingjing. 2018. Teens, social media & technology. *Pew Research Center.* Retrieved June 26, 2018 from http://www.pewinternet.org/2018/05/31/teens-social-media-technology-2018/

[60]   Ulrike E. Nett, Thomas Goetz, and Nathan C. Hall. 2011. Coping with boredom in school: An experience sampling perspective. *Contemporary Educational Psychology,* 36, 1, 49–59. https://doi.org/10.1016/j.cedpsych.2010.10.003

[61]   Carman Neustaedter and Saul Greenberg. 2012. Intimacy in long-distance relationships over video chat. In *Proceedings of the Conference on Human Factors in Computing Systems,* 753–762. DOI: https://doi.org/10.1145/2207676.2207785

[62]   Carman Neustaedter, Carolyn Pang, Azadeh Forghani, Erick Oduor, Serena Hillman, Tejinder K. Judge, Michael Massimi, and Saul Greenberg. 2015. Sharing Domestic Life through Long-Term Video Connections. *ACM Transactions on Computer-Human Interaction* 22, 1, 1–29. DOI: https://doi.org/10.1145/2696869

[63]   Eyal Ophir, Clifford Nass, and Anthony D. Wagner. 2009. Cognitive control in media multitaskers. In *Proceedings of the National Academy of Sciences*, 106, 37, 15583–15587. DOI: https://doi.org/10.1073/pnas.0903620106

[64]   Byron Reeves and Clifford Nass. 1998. The media equation. *The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places,* 34, 19–36. DOI: https://doi.org/10.1109/MSPEC.1997.576013

[65]   Marina M. Pool, Tom H.A. Van Der Voort, Johannes W.J. Beentjes, and Cees M. Koolstra. 2000. Background television as an inhibitor of performance on easy and difficult homework assignments. *Communication Research,* 27, 3: 293–326. DOI: https://doi.org/10.1177/009365000027003002

[66]   Leonard Reinecke, Stefan Aufenanger, Manfred E. Beutel, Michael Dreier, Oliver Quiring, Birgit Stark, Klaus Wölfling, and Kai W. Müller. 2017. Digital stress over the life span: The effects of communication load and internet multitasking on perceived stress and psychological health impairments in a German probability sample. *Media Psychology*, 20, 1: 90–115. DOI: https://doi.org/10.1080/15213269.2015.1121832

[67]   Mitchel Resnick. 2017. Lifelong Kindergarten: Cultivating Creativity Through Projects, Passion, Peers, and Play. MIT Press.

[68]   Michael Robb. 2015. Tweens, teens, and screens: What our new research uncovers. *Common Sense Media.* Retrieved April 10, 2018 from https://www.commonsensemedia.org/blog/tweens-teens-and-screens-what-our-new-research-uncovers

[69]   Gili Rusak. 2014. The properties of Twitter network communications among teenagers. In *Proceedings of the Conference on Computer Supported Cooperative Work & Social Computing,* 233–236. DOI: https://doi.org/10.1145/2556420.2556505

[70]   Allison M. Ryan. 2001. The peer group as a context for the development of young adolescent motivation and achievement. *Child Development,* 72, 4, 1135–1150. DOI: https://doi.org/10.1111/1467-8624.00338

[71]   Marie Evans Schmidt, Tiffany A. Pempek, Heather L. Kirkorian, Anne Frankenfield Lund, and Daniel R. Anderson. 2008. The effects of background television on the toy play behavior of very young children. *Child Developmen,* 79, 4, 1137–1151. DOI: https://doi.org/10.1111/j.1467-8624.2008.01180.x

[72]   Bobbi Shatto and Kelly Erwin. 2016. Moving on from millennials: Preparing for generation Z. *The Journal of Continuing Education in Nursing,* 47, 6, 253–254. DOI: https://doi.org/10.3928/00220124-20160518-05

[73]   Jörgen Skågeby. 2010. Gift-giving as a conceptual framework: Framing social behavior in online networks. *Journal of Information Technology,* 25, 2, 170–177. DOI: https://doi.org/10.1057/jit.2010.5

[74]   Jeonghan Son, Keon Uk Kim, Yeon Gyeong Seo, Wonyeong Oh, Seowon Choi, and Ana Kang. 2014. A research based on the effect of smart phone use on consumption life of teenagers in a smart era. In *Lecture Notes in Electrical Engineering,* 99–104. DOI: https://doi.org/10.1007/978-3-642-40675-1_16

[75]   Lucy A. Suchman. 1987. Plans and situated actions: The problem of human-machine communication. Cambridge university press.

[76]   Ewa Szumowska, Agnieszka Popławska-Boruc, Jakub Kuś, Małgorzata Osowiecka, and Justyna Kramarczyk. 2018. When frequent media multitaskers perform worse and when they do not: The

role of self-regulation ability and strategy manipulation. *Computers in Human Behavior,* 83: 184–193. DOI: https://doi.org/10.1016/j.chb.2018.01.043

[77] Mark Tarrant, Adrian C. North, Mark D. Edridge, Laura E. Kirk, Elizabeth A. Smith, and Roisin E. Turner. 2001. Social identity in adolescence. *Journal of Adolescence,* 24, 5: 597–609. DOI: https://doi.org/10.1006/jado.2000.0392

[78] Alex S. Taylor, and Richard Harper. 2002. Age-old practices in the "New World": A study of gift-giving between teenage mobile phone users. In *Proceedings of the Conference on Human Factors in Computing Systems,* 439–446. DOI: https://doi.org/10.1145/503376.503455

[79] Peter Tolmie, Andy Crabtree, Tom Rodden, James Colley, and Ewa Luger. 2016. "This has to be the cats": Personal Data Legibility in Networked Sensing Systems. In *Proceedings of the Conference on Computer Supported Cooperative Work & Social Computing,* 491–502. DOI: https://doi.org/10.1145/2818048.2819992

[80] Melina R. Uncapher, Monica K. Thieu, and Anthony D Wagner. 2016. Media multitasking and memory: Differences in working memory and long-term memory. *Psychonomic Bulletin & Review,* 23, 2, 483–490.

[81] Jessica Vitak. 2012. The impact of context collapse and privacy on social network site disclosures. *Journal of Broadcasting & Electronic Media,* 56, 4, 451–470.

[82] Zheng Wang and John M. Tchernev. 2012. The "Myth" of media multitasking: Reciprocal dynamics of media multitasking, personal needs, and gratifications. *Journal of Communication,* 62, 3: 493–513. DOI: https://doi.org/10.1111/j.1460-2466.2012.01641.x

[83] Chris Welch. 2018. Facebook Messenger doubles number of video chats to 17 billion in 2017. *The Verge.* Retrieved April 19, 2018 from https://www.theverge.com/2017/12/13/16772704/facebook-messenger-17-billion-video-chats-2017

[84] Wikipedia. List of California locations by income. Retrieved April 19, 2018 from https://en.wikipedia.org/wiki/List_of_California_locations_by_income%0A

[85] Pamela Wisniewski, Arup Kumar Ghosh, Heng Xu, Mary Beth Rosson, and John M. Carroll. 2017. Parental control vs. teen self-regulation: Is there a middle ground for mobile online safety? In *Proceedings of the Conference on Computer Supported Cooperative Work,* 51–69. DOI: https://doi.org/10.1145/2998181.2998352

[86] Svetlana Yarosh and Gregory D. Abowd. 2011. Mediated parent-child contact in work-separated families. In *Proceedings of the Conference on Human Factors in Computing Systems,* 1185–1194.DOI: https://doi.org/10.1145/1978942.1979120

[87] Leo Yeykelis, James J. Cummings, and Byron Reeves. 2014. Multitasking on a single device: Arousal and the frequency, anticipation, and prediction of switching between media content on a computer. *Journal of Communication,* 64, 1, 167–192. DOI: https://doi.org/10.1111/jcom.12070

[88] Rui Zhou, Zhonghe Wen, Muchao Tang, and Betsy DiSalvo. 2017. Navigating media use: Chinese parents and their overseas adolescent children on WeChat. In *Proceedings of the Conference on Designing Interactive Systems,* 1025–1037. DOI: http://doi.org/10.1145/3064663.3064701

[89] Teens Are Spending Hours on This Video Chat App *(n.d.).* 2016. *NBC.* Retrieve July 4, 2018 from https://www.nbcnews.com/tech/social-media/house-party-teens-are-spending-hours-video-chat-app-n747201

APPENDIX - Demographics of Teen Participants

ID	Gender	Age	Occupations Types of Parents (Mom/Dad)*		Frequency**	Apps Usage for Videochat	# of People ***	# of Pictures ****
P1	M	14	Service and sales workers	NA	A few times a week	Facetime, Skype	6	10
P2	F	14	Not employed (Home-maker)	Craft and related trades workers	A few times a week	Facetime, ooVoo, Houseparty	6	26
P3	F	16	Professionals	Professionals	Once a week	Skype, Facebook, Cabana	4	19
P4	F	14	Service and sales workers	Service and sales workers	Once a week	Skpe, ooVoo	5	0
P5	M	17	Managers	Professionals	Everyday	Facetime, Houseparty	20	26
P6	F	13	Not employed	NA	Everyday	Facetime, Monkey, ooVoo	40	7
P7	M	17	Service and sales worker	Craft and related trades workers	Everyday	Facetime, Houseparty	5	27
P8	F	16	Technicians and associate professionals	Service and sales workers	Everyday	Facetime, ooVoo, Cabana	3	5
P9	F	16	Not employed (Home-maker)	Professionals	Everyday	Skype, Snapchat, WeChat, Facebook	20	16
P10	F	17	Service and sales workers	Service and sales workers	Everyday	Facetime, Skype, Snapchat, Facebook	4	2
P11	F	14	Professionals	Professionals	Everyday	Facetime, ooVoo, Skype	6	30
P12	F	13	Service and sales worker	NA	A few times a week	Facetime, ooVoo	3	11
P13	F	15	Service and sales worker	NA	A few times a week	Facetime, ooVoo, Houseparty	5	8
P14	F	17	Clerical support workers	Elementary occupations	Everyday	FaceTime, ooVoo, Skype, Tango	15	5
P15	M	16	Professionals	NA	A few times a week	Facetime, Skype, Snapchat	4	7
P16	M	14	Clerical support workers	Elementary occupations	A few times a week	Tango, FaceTime, ooVoo, Skype	20	4

* Specific Occupations are categorized following International Standard Classification of Occupations (ISCO) [36]; ** usual videochat frequency; *** the numbers of people for videochat; **** the numbers of pictures each participant submitted for photo-diary