

parishes, St. James (on the north-west coast) and Clarendon (on the south coast). Two thirds of the participants resided in or around rural or suburban districts in Clarendon, while the rest resided in an urban city in St. James.

Our interviews were conducted in the homes or workplaces of participants, in public places such as the local church or library courtyard or at the researcher's base within the community. The interviews were conducted by the first author in a mix of English and the Jamaican patois dialect to keep it more conversational and less formal. The questions for left-behind children and migrant parents focused mainly on understanding the experiences of these individuals during the separation, and their use of technologies and, for those who reunited in the US post-migration, reflection on the parent-child reunification experience. We asked teachers and guardians questions about conveying information concerning the child to parents abroad. Questions also focused on the use of and difficulties with different technologies for communicating with parents abroad and with children back home. For parents we focused on their experiences with remote parenting, though we also received this information from the account of left-behind children, guardians and teachers.

We identified thematic connections in the first round of interviews following a data-driven approach [23]. Various themes began to emerge from the data including the communications challenges for members of the child's network, specifically parent-teacher and parent-guardian, as well as issues of trust between some members. These themes directed the second phase of the study which we again analyzed for thematic connections [23]. In the section that follows, we mix descriptions of the affects of migration and migrating on our participants (to contextualize the role that communications plays) with discussions on how communications technologies are used and not used to manage the affects of migration.

CONTEXTUALIZING MIGRATION

In our research we were struck by how the responsibility for left-behind children was spread among people. To set up the context for later discussions, we will first describe the different potential guardians and the child's caregiving network and support this description with the educators' experiences with left-behind children.

Guardianship and Caregiving

When one parent remains behind, that person typically shared information about the child with the migrant parent. This would happen via a phone call (landline or mobile) or through letters sent in the mail or carried by relatives and friends going abroad themselves. The collocated parent was also usually responsible for discipline or enforcing it. In the cases where the parent who normally helped with things like homework migrated, and if the at-home adult was preoccupied with work, then the child sometimes slacked off. In some cases domestic help, known as 'helpers' in

Jamaica were hired, but these individuals did not always have the authority to make the child do chores and homework. Some children described the loss of this environment and older siblings also talked about having to assume surrogate parental roles:

"...because my stepdad was a police officer so a lot of times he wasn't there and we were just there with my helper and my grandmother...It seemed like there was no adult there, even though my helper was there, it wasn't the same as having a parent there. It felt like we were on our own. So that became depressing after a while. Because then I had to take up that mother role and take care of my sister. That part of it was really hard." (P04A)

Not surprisingly, when a relative or non-parent guardian assumes responsibility for the teen, he or she typically acts as middleman conveying information about the child to the migrant parent mostly by phone though some talked about sending materials such as the child's report card to the parent. Also, we heard that the relative who spoke with the parent was not always the same one who provided support to the child such as helping them with homework, since at times, guardians shared primary responsibility for a child. One woman explained this:

"other relatives came to the house to help and then some weekdays I would be by my aunt's place" (P03A)

Children left with non-relative (or relative-like) guardians seemed to be essentially treated as boarders. These guardians communicated with migrant parents about the child, but sometimes these calls were timed to the financial benefit of doing so (e.g., to ask for money to cover the child's expenses). Educators often saw the consequences of these less authoritative arrangements.

"...most of them are rude, most of them are disrespectful and I think its not because they are without guidance, its lack of respect for the guidance they are given, because a lot of children when parents are not there they feel like the next person is just second in command they don't have to listen [...] a lot of the parents out of guilt try to stay where they are and parent the child out here which is impossible so it becomes a problem [...] a lot of the times the guardian who turns up has very very very little control." (P13E)

Finally, in some cases (this happened for one family with six left-behind children) we learned that children left behind became the head of the household. Termed 'parentification' [1] children assume adult responsibilities like managing the household finances. Reasons for this vary. For instance the parent may be a seasonal migrant who returns periodically and so desires to maintain their house or apartment to reside in during return visits. Another possible reason is the absence of trusted individuals with whom a parent can leave their child. One teacher explains the challenges this presents:

“They have to now so called fend for themselves and they are the leader of the household nobody is really there to correct them or to guide them so they are harder to deal with.”(P21E)

Teen-led households seemed especially prone to receiving goods in barrel form. We also learned that communications in this situation were very frequent since the children needed routine ‘money transfers’ from parents in order to maintain the household.

Educators Experiences with Left-Behind Children

Our first round of interviews highlighted the importance of educators. Educators, who spend more time with the child than many of the other caregivers, often saw potential problems but often did not have access to the parent. Instead when a guardian would come to the school for a parent-teacher evening or in response to a request, educators would be confronted with people who clearly could not be the parent like a slightly older sibling or their grandmother. Educators recognized these as signals that the child was left-behind as a result of parental migration.

The problems of not having a parent representing the child at school were made more problematic for the educators when there were concerns they wanted to share with a parent. Educators talked about a variety of problems they encountered with left-behind children. A group of these problems stemmed from the increased wealth (due to the remittances and barrels sent home) that allowed the left-behind children to break school rules, such as violating the uniform code or using banned technologies. As one explained:

“You see them wearing name brand shoes. They wear their uniform so everybody would be in the same uniform but they wear name brand shoes and bags and so on. And most times, they would be the ones who have more money to spend to buy.” (P10E)

Other issues included behavior and fluctuating academic patterns often stemming from waiting to migrate syndrome.

“...many of them are being promised for years that [parents abroad] are going to file for them and they going to live abroad so then they sit in school and do nothing...and I don’t think the parents are making clear that they need to do well...I know of some who have become adults and they still here.”(P13E)

We learned from our participants about the unpredictability of migration. Many spoke to us about how parents migrated with a plan of what would happen including having a definite period of time away and planned reunification through either sending for the child or returning to Jamaica. However, once gone, the initial time period was often extended beyond initial expectations. Short-term seasonal migration became long term or was done in frequent cycles (not just a one time occurrence); longer term (but finite) stays became permanent or indefinite; and visions of



Figure 1. Mobile phones (present here) and improper uniform are usually prohibited in Jamaican schools.

sending for the child often waned as a result of lengthy and costly immigration processes. Confronted with these situations, the educators we spoke with wanted a single point of parental contact to address these issues (and to explain the reality of migration to the waiting child). Additionally, some educators spoke about being a person that the left-behind child confided in about a particular issue, an event that would also make them want to find the right person in the caregiving network to talk too. Instead in some cases they were either rotated through a series of people being the child’s guardian, or meeting people who could not assert that authority (siblings, non-relative guardians). It was these types of concerns that drew our attention to the important role that educators have in the caregiving network.

In the next section we discuss a set of themes which emerged from our participants stories of using ICTs to afford better connections and overcome the distance.

Ubiquitous availability

The Jamaican context allows us to consider unforeseen ways in which ICTs are taken up into transnational migrant flows. And in the process of crossing borders, infrastructure becomes visible even when it is not broken [32]. In our research we found our migrants, needing to work in both systems (in their work context in the U.S. and within the Jamaican system to continue to parent their children) were using the mobile phone infrastructure to ameliorate some of the difficulties associated with the loss of spatial anchorings when parents left. This led to an expectation of ‘ubiquitous availability’. As such, technology was involved in attempts to shift the infrastructure to produce a micro-infrastructure in the home to allow connectivity with family abroad. Parents sent home a variety of electronics including desktops, laptops and phones, in addition to other barrel items all designed to give the children something of the resources and experiences of the foreign country. But they also sent back the payments required to operate the devices, whether that be the money needed to pay for the mobile phone plan, or enough to cover the costs of connecting the computer to the Internet. One dad who had migrated with his wife and left behind several children, preemptively bought and set up video conferencing and instant messaging

technologies for his children (in the late 90s when these tools were not widespread).

Well, it wasn't common but I had to do it because we had to communicate. It was necessary...It was really costly.” (P09P)

In a few cases, we saw this same desire to create new infrastructural opportunities for educators too, to give them similar types of resources so that they could call anytime to alert parents to problems. But this practice was not widespread, despite the potential it had to help remote parents parent.

We also learned that there were limits to the ability level of the micro-infrastructure supplied to provide ubiquitous availability. For instance, theft or fear of theft at times dictated the actual ‘mobility’ of a mobile technology for our participants. One teen said she could not bring her laptop to the public library to use the free wireless Internet to communicate with her mom because her Aunt who was her new primary caregiver, was afraid it would be stolen. And others also described reasons for their intermittent unavailability via a medium such as in cases of a delay in remittances that financed either the Internet or a cellular calling plan.

The home micro-infrastructure

Parents and children talked about using the home micro-infrastructure to interact in three different ways: exchanging information such as one’s daily activities, sharing sentiments and bonding through shared interests such as music, fashion, pictures and current gossip in the home community. The most frequently used technologies were the mobile and landline phone. Not surprisingly, the majority of teens reported having phone conversations with parents that included saying things such as “I miss you” and asking about reunification and the parent’s plans to return home. Parents on the other hand asked their children about daily activities, as a means to remain connected with the routines of the left-behind child. As one child explained:

“I share with him what I did for the day and how everybody in the scheme [community] and he ask like how everybody and what I eat... I show off on him but it’s because I know it is his favorite [food].” (P19C)

While mobile phone talk dominated discussions of technologies other ICTs were also used. For example, several participants spoke about exchanging and discussing music or videos with their parents through some social networking site for instance. This habit of mutual sharing seemed to increase the child’s thoughts about his or her parent such as when they encountered something they thought would be of interest to them.

We also heard about two cases where a wider variety of technologies were being used during parent-child interactions. One teen reported using a video iPod Touch in a restaurant with Wi-Fi so his mom living in Europe could

‘be a part of the family dinner’. Others talked about using desktop or laptop computers with Internet access and email which facilitated the sharing of documents and media between parent and child. The use of text messaging was often limited to urgent messages or requests to ‘please call me’. And others, talked to us about interest in adopting other technologies such as Skype and Facebook. We next describe how this micro-infrastructure was taken up in negotiations of control.

Negotiating Control

Irrespective of which particular living situation the child found themselves in, a common theme in the interviews was the expansion of the caregiving network to additional people, each of whom had only a certain amount of control over the child and the home. Parents did not completely relinquish control of the child’s development and welfare, even though they moved abroad. A key finding of our study reveals challenges with control that the mobile phone exacerbated as it was being taken up in this network. These challenges occurred amidst negotiations of control by parents, guardians and children alike.

The micro-infrastructure in the home allowed some parents to remotely mediate in various household matters such as getting the child to do their chores or homework, mediating guardian-child tensions, or to advocate for the child.

“A lot of times my sister would complain about things that the helpers did and didn’t do and at a point my mom, even though she was so far away, she would try to call and be the mediator and she would you know ask questions, ask the helper questions like what did ‘X’ do or what she didn’t do...” (P04P)

In some cases, migrant parents would also call guardians to get their help in ensuring punishment or restrictions they have meted out to the child were followed through on.

However, despite the ubiquity and utility of technology in the lives of these families, our participants also talked about challenges that stemmed from their use. Most commonly this seemed to be around the negotiation of parental authority. In many cases, parents tried to maintain direct access to the child, by giving them personal mobile phones. However, even if it was intended as allowing the parent and child to communicate regularly, that type of interaction sometimes had the potential to undermine the authority of the guardian. This was particularly pronounced if the parent was also using the phone to coordinate with the child about sending money. As a teacher explained:

“...the thing now is that the aunt will have her rules and then the mother will say but I don’t want this for my child but even though the mother left the aunt in charge of her child she doesn’t want the aunt to make certain decisions and place certain rules so the child is kind of confused in a sense and sort of acts out and the aunt now is not able to do what she thinks is correct and be successful...the

child will go to the mother...speak to mother on the phone and the mother just sends the money into the account and the child has access to the account and goes and takes out the money which undermines everything that the aunt is trying to do and eventually that child he is boarding now with a stranger ” (P17E)

Another situation in which a similar confusion emerged about who was in charge of what pertaining to the child, arose in the case of a migrant mother (separated for over ten years by this point) who somewhat unwillingly relinquished authority of her left-behind child to a non-relative guardian. This guardian in turn discouraged the mother from buying the child a mobile phone saying the child was too young to have one. As a consequence of this arrangement, the mother felt that the child—now only able to talk to her when supervised by the guardian—and she were no longer able to talk openly. This led to the mother finding other ways to initiate calls, through a close friend of hers who resided in the same community. In other words, the troubles we heard about with mobile phones were not a consequence of the technology, but that their use allowed confusion or disagreement about the boundaries of responsibilities within the left-behind child’s network to propagate and persist.

Children too were involved in this negotiation of control through mobile phones. The deregulation of the Jamaican telephone market, the entry of Digicel (a competitor to the incumbent Cable & Wireless) and the consequent availability of new bizware [19] (particularly cheap calling plans) changed communications for our participants. Cheaper call plans gave those children left behind post-deregulation control of communications with their migrant parents. Rather than having to wait for a call on their parent’s schedule, they were able to initiate them at their own discretion giving them some control and causing a shift in the power balance. One participant noted how she took advantage of this only calling her mom after she did her chores, so that her mom could no longer dictate beforehand how she should go about doing it.

“like when [I] call her everyday [to] tell her what [I] do in [the] morning and she [is going to] ask if [I did the] laundry... [because] she always do the washing she tell me how to put [the clothes] in the machine and stuff, how to wash with my hands and what clothes run.... It’s like she’s still here... but now I just tell her how I do it...and like she tell me where she disagree or she like say ok then.” (P12C)

Heightened sense of connection (or alienation)

In our interviews we saw how “more” (communication) didn’t always mean “more” (sense of connection) between parent and child. Though in some situations it did, in others it actually led to alienation. Additionally, we were struck by the difference that the deregulation of the Jamaican cellular market as mentioned earlier and the recent accessibility of cheap international plans had made for left-behind children.

Those who were left behind after the deregulation (current left behind children) talked about being able to spontaneously initiate calls to their parents which often resulted in a heightened sense of connection amidst the distance. These children also seemed far more apt to describe their conversations as fun and interesting. One boy describes his spontaneous conversations with his mom about new music.

“If I hear a new band that I like I will share it with her and if she hears one there, she will tell be about it”(P28C)

By contrast those left behind before this time (our adult participants who were reflecting on their experiences) talked about needing to wait for their parent to call, since it was only the emigrant who could afford to make the call. As a consequence of this one-way initiating, children seemed to feel it led to parent(s) being alienated from household matters even when they received daily calls.

“So things that you know, it’s not everything, we couldn’t just take up the phone and call her every second, so its like ok we’re gonna cling to the next person which was my stepdad. So its like ok, something happening exciting we would probably have to wait for her to call...while he was there instantly... when she calls you don’t think about those silly stuff to talk about.” (P04A)

Another problem with high frequency but always one-way initiated calls was that for the left-behind children they sometimes took on a rather pro-forma feeling, as one child described:

“If it was a case where I spoke to her for like three times or four times for the week then she already... it was pretty much ‘hi, how are you doing, I am fine and that was it.’ (P04A)

The dissatisfaction with one way initiated calls echoes the findings from Madianou and Miller’s [15] study of Filipina migrant mothers who were also the ones to make calls. Children in that study also reported the calls as at best uninteresting and at worst actually irritating.

Perceptions of Authenticity

Another important use of technology was to ‘triangulate’ the truth. Participants (including parents, guardians and children) all reported the importance of migrant parents being able to hear multiple sides of a story. This was often accomplished by phone calls from the parents to different members of the child’s network based on the nature of the situation. For instance, parents would call guardians to verify information conveyed to them by their children or to verify if in fact the child is behaving and adhering to rules as claimed

“We had to know what is happening, if there is any disciplinary problems...” (P09P)

And guardians, and in particular non-relative guardians, seemed to be particularly prone to being targets of parent's concerns about whether their child was receiving appropriate remittances, was being unfairly treated in any given situation or was preventing the child from truly communicating with the parent.

"... We have to know financially, if all their needs were being taken care of. Because then the monetary situation, it wasn't going directly to them, and so, tactfully we had to make sure that they were satisfied with what is going on." (P09P)

One parent discussed her continued level of mistrust towards her child's non-relative guardian and how she ensures his well being by having a good friend keep watch.

"Even though [the guardian] calls every minute, you are out of the loop no matter what. They hide stuff. If they did something to the child, they won't want you to know. But I have a friend who lives in the same community. I ask her to keep an eye on my son because you can't always trust them. So I call her and she will let me know what the situation is. That's how you have to do it." (P08P)

Thus migrant parents used technology to validate the truth and maintain a level of insight into whether the left-behind child was not only behaving and doing well but also to understand and keep an eye on their treatment by the guardian in charge.

EXTENDED CAREGIVING NETWORKS

We felt that understanding technology use needed to be broadened to include the various different constituencies both at home and school. In this section, we describe the themes that emerged from technology use across the caregiving network.

Parental Involvement in School

Despite the educators desire to talk to parents it did not often happen. Communication seemed to be easiest when parents were embedded in social networks, either having taught at their child's school or from having a relative or friend working there. This echoes research which seeks to use parents social networks to predict parental involvement in home and school [24]. In these cases information such as the child's academic record and so forth was readily shared. However, we did learn that even when this wasn't the case, a few parents did recognize the importance of the connection to educators and would either call teachers directly from abroad, or have the child initiate the contact while at school. One teacher reported that some parents sent pre-paid cards for contacting them:

"I use my personal credit too. Good parents you know who will even send you credit... to call. Or if they don't do that they just know that they must call you every two weeks or something like that." (P21E)

One now adult child described the difference that educator-parent communication made in her case:

"...one of my best friends when I was growing up going to that school her mother is a teacher there and they both talk together so I think I was struggling in school...with taking the common entrance and she [my mom] called me and she asked me about it but I didn't tell her anything and I don't think I told my dad but because [the teacher] who was helping me at the time was her friend...she told my dad and I think my mom called her and she told my mom too... I guess wasn't paying attention so they got me a tutor" (P03A)

One challenge for educators of left-behind children was that in the absence of the parent, some of the information that they needed was withheld (sometimes by the child).

"You know, you have a one to one. And when you know the parents, I think you feel better, even when you're speaking to a child, you know where he is coming from. And too when the parents come, you can get some information that you should have had, that the child won't give you." (P10E)

Teachers also spoke about their inability to help children in cases where they could not contact the parents or a legal guardian (with appropriate legal authority to sign off on the child). This led to situations where children were unable to participate in school activities, further increasing their sense of isolation and difference due to the consequences of being left behind.

"If there is something that the parent has to sign, so legal, for instance a child may be going out the school, or going on a trip or so and you need the parents to sign a consent to say yes I allow the child to go and there are other activities as well the parent need to sign or the legal guardian need to sign. If the child lives by himself or the child is with an underage sibling, then the school is faced with a challenge because no one can sign." (P10E)

While the mobile phone helped a few parents and educators and often those who knew each other well enough to communicate, the bigger problem for educators was that they wanted to have a means to interact and didn't. They had important communications needs, such as those associated with getting children help, having someone assert authority over a child not doing homework, and having someone to sign off that an activity was appropriate. Yet, they lacked the opportunities to develop communication networks to reach the people they needed to talk with.

CONCLUSION

To discuss the relevance of our research to the design of future Ubicomp systems, rather than focusing on cultural specificities, we need to pull the Jamaican context into "ours" [28]. While the Jamaican scenario we presented

gives a rich description of family communication, caregiving and micro-infrastructure as it is taken up in the context of transnational migration, what happens there happens in other places. We contribute to a discussion of thinking about ubiquitous computing systems embedded in family care or transnational networks.

In the transnational networks in our study we found that mobile phones were the preferred means of communication and the probable cause of an expectation of ‘ubiquitous availability’ in families. This led to the adoption of other technologies by participants and the provision of resources (such as remittance) to support its functioning. Additionally they became tools with which to negotiate control. Since guardians, and in particular non-relative guardians, seemed to be particularly prone to being targets of parent’s concerns, parents used the mobile phone to connect with other people in their social network to find out how the child was *really* doing. Those who had a direct line of communication to their children—who owned their own mobile phones—were able to retain parental authority and in some cases diluted the authority of the collocated adult. Even children, empowered by cheap calling plans that allowed them to be in control of initiating calls to parents abroad, did so in ways to minimize tensions and improve relations with parents. This research provides an opportunity to take up the following question on the affects of future technology on family care or transnational networks:

What does “more” mean when introducing additional technologies into family and care networks? And do the systems we introduce reinforce or shift the power structure in the extended caregiving networks into which they are embedded?

Our study also showed how physical Ubicomp systems (such as the mobile phone) are just a piece of a broader set of infrastructures that need to be in place in order for it to “work” at all. Creating a micro-infrastructure in the home meant not just sending the devices but also sending the resources to finance their operations. The next question helps us to consider the ability level of future systems in varying infrastructures:

As even the most globally ubiquitous platforms attempt to work within and cross multiple types of infrastructures, what do or can new technologies provide for connecting these ‘at a distant’ networks and what remains difficult?

Extended Caregiving Networks

Our final point contributes to a discussion about our consideration of family care networks as more than just the local family. Children in just about every part of the world, even in intact families are embedded in caregiving networks that extend beyond parents to include educators and extended family members alike that serve as sources of information about a child [33]. As such, any focus on

family communication or parent-child connectedness needs to consider wider networks than just the family at home, which currently is only regarded in cases of long-term disruptions such as divorce [33].

Our focus on educators reveals a largely disconnected group. While a few had the means to call parents, more often than not, we learned that they had little ability to reach either the migrant parent or the child’s appropriate guardian in Jamaica. The mobile phone may have possibility here, but as yet, it had not been widely realized. Indeed, in conversations with educators about the use of telephony and email, there was a genuine enthusiasm for collecting more contact information from parents and guardians and reflection on why the records collected at schools did not include this information. The fact that most often the parents who did communicate with the teachers did so through connections in their social networks again emphasizes the importance of having a connected network to aid in caregiving.

And like these Jamaican educators, educators based in the United States are also concerned with parental involvement both at home and school given research has found that children whose parents are involved in school and connected to social networks, have better academic outcomes than those who do not [24]. And yet, one study looking at US mothers specifically, found that as many as 85% of them did not volunteer at their children’s school [24]. And the level of involvement was lower for those who worked full-time, thus missing out as a result on opportunities to connect with educators and other parents.

It takes a much broader care network to raise a child. Technology use needs to be expanded to include the different constituencies both at home and school. An overly narrow focus on caregiving as ‘parent to child’ could limit opportunities for Ubicomp to aid in connecting isolated parents both locally and abroad to the larger social networks critical for improving the outcome of children.

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