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Transnational Family Communication as a Driver of Technology Adoption

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The diffusion of information and communication technologies (ICTs) has made transnational communication more affordable and intensive. In this article, we examine how transnational family communication shapes immigrant families' technology adoption and appropriation. Through interviews with immigrant Latino families about their experiences with computers, mobile devices, and the Internet, transnational family communication emerged as a motivating factor for purchasing and introducing digital technologies into the household. Digital ICTs help parents maintain virtual intimacy with faraway relatives, secure emotional support, and engage in transnational caregiving. For their children, cross-border interactions serve as opportunities to support their parents' efforts to maintain family continuity. Such motivations facilitate a process of appropriation as families negotiate the affordances of particular devices and platforms.

Keywords: ICTs, transnationalism, family communication, technology adoption

Cross-border, or *transnational*, communication is integral to the immigrant experience and has been documented across immigrant groups since the first Great Wave of migration to the United States in the late 1800s (Gabaccia, 2000; Morawska, 2009). Immigrant families have relied heavily on available communication technologies to bridge physical distances and sustain personal relationships, especially when residency or economic restrictions make in-person contact either infrequent or impossible. Recent innovations in, and diffusion of, information and communication technologies (ICTs) such as broadband Internet and mobile phones have made transnational communication more affordable and intensive than in the past.

In this article, we extend current literature by examining how transnational family communication motivates immigrant families' technology adoption as well as how parents and children engage ICTs for

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these purposes. We focus on immigrant families[2] in the United States who identify as Hispanic or Latino.[3] More specifically, we focus on lower-income[4] families in this demographic, because the majority (62%) of Hispanic children are growing up in families that meet this financial designation (Jiang, Ekono, & Skinner, 2016).

Americans with Latin American heritage currently comprise 17% of the overall U.S. population, and this proportion is projected to double to 106 million by 2050 (Motel & Patten, 2014). Although continued migration from Central and South America are contributing factors, U.S. births are the bigger driver of Latino population growth. At present, one-quarter of U.S. children are Latino, 90% of whom are U.S.-born and 50% of whom have at least one foreign-born parent (Kids Count Data Center, 2015). These data suggest that connections to places and people beyond U.S. borders are part of everyday life for many Latino adults and children.

Our focus on transnational communication in family life builds on the existing literature in a few important ways. Most fundamentally, the underlying motivations for the rapid, recent uptick in U.S. Latinos' technology adoption have yet to be fully uncovered. National reports reveal that Latinos are now accessing the Internet and adopting Internet-capable devices at equivalent or higher rates compared to other ethnic groups (Livingston, 2011; Lopez, Gonzalez-Barrera, & Patten, 2013; Matsaganis, 2012). By 2012, a majority of Latino adults (78%) were using the Internet at least occasionally—a sharp rise from 2009, when only 64% reported going online (Lopez et al., 2013). Latino Internet users are also more likely than White Internet users to go online using a mobile device (76% versus 60%). This preference for mobile devices helps explain why gaps in mobile phone ownership have also effectively disappeared, with 86% of Latinos reporting owning a cell or smart phone, compared with 76% in 2009 (Lopez et al., 2013). Although the increased affordability of digital devices is unquestionably a factor in these trends, the goals that Latinos seek to address by engaging these technologies are an important, and often unstudied, explanatory factor.

Furthermore, scholars have generally framed technology adoption or acceptance as an individualized set of choices (see Venkatesh, Morris, Davis, & Davis, 2003, for a review). Instead, we argue that focusing on familial contexts provides more nuanced perspectives on immigrants' motivations for purchasing and utilizing ICTs. A familial approach is particularly appropriate in the case of U.S. Latinos; according to the U.S. Census Bureau (2014), the majority (77%) of the 14.7 million Latino households in

[2] We define immigrant families as those in which at least one parent was born outside of the United States.

[3] Hispanic and Latino are often used interchangeably as ethnic referents. Researchers have not noted a distinct preference for one term over the other among U.S. adults with roots in Spanish-speaking countries (Taylor, Lopez, Martinez, & Velasco, 2012). In this article, we use Latino except when we cite studies that explicitly used Hispanic as the referent term.

[4] The National Center for Children in Poverty defines low-income as growing up below 200% of the federal poverty threshold; for a family of four, the threshold in 2014 was $24,008 (Jiang et al., 2016).

the United States are considered family households, and 66% of these households include children under the age of 18.[5]

To examine families' technology adoption and engagement behaviors, we interviewed parents and children in lower-income Latino families about their experiences with computers, mobile devices, and the Internet. During these conversations, transnational communication strongly emerged as a motivating factor for introducing new technologies into the household. For immigrant parents, digital ICTs help to sustain valued relationships between their nuclear families and relatives in their country of origin. For their children, cross-border interactions serve as linguistic and cultural development activities, but primarily as opportunities to support their parents' efforts to maintain family continuity.

In the following sections, we review literature on the impact of ICTs on long-distance communication broadly, and on transnational family communication specifically. We also discuss how a family-based approach, which accounts for the perspectives of immigrant parents and of their second-generation children, expands our understanding of transnationalism in the digital age. We then present analyses of our qualitative data regarding how parents and children experience transnational practices as individuals and as members of a family unit.

Transnational Family Communication

A growing body of research examines the implications of mobile phones, social networking sites, and other ICTs for family communication, and for family life more broadly (see Hertlein, 2012, and Rudi, Dworkin, Walker, & Doty, 2015, for reviews). Livingstone (2002) notes that ICTs have "become part of the infrastructure of family life" (p. 67) by affecting the spatial definition of the home as well as the temporal definition of everyday family routines. Kennedy and Wellman (2007) document how personalized and networked connectivity (particularly through the use of mobile Internet-enabled devices) can facilitate coordination of household decision making, fostering a sense of reliable connectedness and family continuity.

However, little research exists on how newer, digital ICTs are implicated in efforts to sustain long-distance family ties. Rudi et al. (2015) help to fill this gap by examining how social networking sites and videoconferencing interfaces shape long-distance family communication. The authors report that parents of young children in particular routinely use ICTs to share visual artifacts of events with faraway family members (e.g., school pictures, videos of a child's first steps). Rodriguez (2014) finds that these kinds of updates during periods of physical separation can help maintain family continuity, and Furukawa and Driessnack (2013) indicate that communicating via video on Skype and FaceTime enhances perceptions of virtual copresence for separated family members by providing nonverbal and contextual cues during mediated interactions.

[5] The U.S. Census Bureau defines family as a group of two people or more (one of whom is the householder) related by birth, marriage, or adoption, and residing together.

For immigrants, long-distance family communication is often transnational communication. Migration scholars have chronicled how innovations in communication technologies have impacted the nature and frequency of transnational connections in the current era as well as during prior periods of migration (Georgiou, 2006; Horst, 2006; Madianou, 2012; Panagakos & Horst, 2006; Portes, Guarnizo, & Landolt, 1999; Tazanu, 2015). Morawska (2001) and Gabaccia (2000) document earlier periods of transnational communication, including, for example, how frequent letters between Europe and the United States allowed migrants to remain closely connected to hometown happenings. Through these exchanges, migrants participated in everyday family life by, for example, making decisions about purchasing farm animals or rebuking their wives on the basis of gossip about infidelity that had traveled in others' letters.

As communication technologies advanced, so did the possibilities for maintaining close contact across borders. In 2004, Vertovec described international phone calls as the "social glue of migrant transnationalism", positing that they had the greatest impact on global linkage of any communication technology to date (p. 219). Since that time, a number of scholars have investigated how ICTs are adopted and appropriated for goals related to maintaining transnational family ties (see Bacigalupe and Lambe, 2011, for a review). Georgiou (2006) describes how e-mail exchanges and photo sharing between family and friends dispersed throughout Greece, England, and the United States have facilitated what she terms "intimate everyday experiences." The free and immediate connection that e-mails provide makes it possible for immigrants to share "the ordinariness, routines and common activities of everyday life, which reinforces a sense of belonging" (Georgiou, 2006, p. 75).

These experiences appear to be consistent across varied countries of origin and settlement. For example, Benítez (2006) documents how Salvadoran immigrants maintain transnational ties with family, social, and political networks. Diasporic Internet communications help disrupt national boundaries and create what Benítez calls "transnational spaces of experience" (p. 191). Increased dependence on ICTs to maintain transnational connections has thus transformed familial and cultural bonds into what Diminescu (2008) calls "virtual bonds," enabling immigrants to maintain familiarity with the details of family members' everyday lives. Wilding (2006) adds nuance to these perspectives, positing that mediated forms of communication create both opportunities and tensions, because virtual closeness is not always a substitute for physical comfort and support. Most studies of ICT use among transnational families focus on the migrants themselves, but Pearce, Slaker, and Ahmad (2013) note that family members who are "left behind" are also more likely to adopt and engage ICTs. Through virtual copresence, digital technologies thus have the potential to buffer the emotional effects of migration on familial connectedness for both the migrant and his or her family members.

Bacigalupe and Cámara (2012) approach transnational communication from a social psychological perspective, positing that transnational processes are fundamental to the immigrant experience and have implications for health and wellbeing. The authors describe how social technologies have facilitated the "transnationalisation of family life," requiring a shift in clinical practice to uncover the impact of digital communication on immigrant families' mental health. More specifically, because immigration has traditionally been associated with feelings of loss and acculturative stress, digital tools that help manage physical distance may mitigate the emotional impact of family separation.

A common thread in this work is an emphasis on how maintaining connections across borders accrues a broad range of psychosocial opportunities and challenges. There is also implicit acknowledgement that immigrants' motivations for maintaining transnational ties may drive them to adopt ICTs to use for these purposes. Madianou and Miller (2012) note that transnational families often develop media literacy skills to facilitate communication with distant loved ones. They suggest that technology adoption and engagement for transnational communication is shaped by more than structural factors such as cost and access; family continuity itself becomes a motivating force behind tech adoption and related skills development. Madianou and Miller also coined the term "remediation" to describe the unexpected outcomes of transnational families finding new, and generally more affordable, ways to sustain long-distance relationships.

Aligned with the serendipity and innovation that remediation suggests, Bar, Weber, and Pisani (2016) argue for focusing on technology "appropriation" (as opposed to adoption) as a "creative renegotiation process" that occurs when users adapt technology and make it their own in ways that better meet their needs. In immigrant households, digital literacy may differ across generations, as do perceptions about the usefulness and safety of various devices. For example, following the emergence of voice-over-Internet protocol (VoIP), Latino immigrants quickly shifted from using prepaid telephone cards to using mobile phones and VoIP platforms to make transnational calls (Matsaganis, 2009). Although the idea of VoIP may have seemed confusing, or even suspect, to some consumers, immigrants were generally quick to recognize that VoIP could facilitate more frequent and affordable interactions.

By focusing on motivations for technology adoption in the context of a specific goal (in this case, transnational family communication) and in a specific cultural context, we can better understand how individuals evaluate the utility of ICTs and operationalize their growing access to technology. Our first research question examines how transnational communication operates as a motivational driver for technology adoption and appropriation from the perspective of immigrant parents:

RQ1: How do motivations related to enhancing transnational ties drive ICT adoption and appropriation in immigrant families?

Transnationalism Across Generations

The literature on transnational family communication has, with few exceptions (e.g., Baldassar, Baldock, & Wilding, 2007; Baldassar, Nedelcu, Merla, & Wilding, 2016; King & Christou, 2011), coalesced primarily around two issues. The first is the exchange between first-generation immigrants and their relatives in the home country. The second, more recent focus has questioned whether these intensive levels of transnational activity are sustained among second-generation children of immigrants. Both issues address transnational activity within a single immigrant generation. As a corrective to these approaches, we investigate transnational activity within multigenerational immigrant families in the United States by focusing on parent–child interactions related to their cross-border communication. Examining intergenerational dynamics in immigrant families expands the literature on transnationalism by identifying how children contribute to their parents' efforts to maintain close contact with faraway relatives and what motivates children to engage in transnational exchanges themselves.

The family household often provides the main conduit for intergenerational transmission of home-country attachments through homeland-oriented activities and practices (Soehl & Waldinger, 2010). However, outside of children's visits to their parents' home countries, little evidence has documented how such transmissions occur. We draw on research related to immigrant families' engagement with media more broadly to consider how these patterns may also apply to family interactions around transnational communication.

Scholars have highlighted how immigrant families' media engagement fosters linguistic and cultural transmission. Mayer (2003) examines how U.S.-born teens bond with their immigrant mothers and grandmothers through co-viewing of Mexican-produced soap operas (telenovelas). The telenovelas provide opportunities for Spanish-language development and family discussions about cultural values and life in Mexico. Durham's (2004) research with Indian-origin families also underscores how joint media engagement encourages linguistic and cultural continuity across generations. Durham notes that parent–child exchanges can provide linguistic and host-country cultural socialization. These studies show that interaction around media content provides mutual learning opportunities for immigrant parents and children.

Survey-based studies confirm that parent–child interactions around media are often more intensive and frequent in immigrant than native-born families (see Katz, 2014a, for a review). Clark (2011) notes that the interactive nature of new communications technologies provides unprecedented opportunities for parents and children to learn from each other. Katz (2014b) builds on Clark's perspective by examining how children who are the primary English speakers in their immigrant, Mexican-origin families act as *brokers* for their parents, noting that brokering activities often involve using a range of ICTs.

Katz (2014b) also notes that children's motivations to broker are often animated by recognizing that they have capabilities to help their parents address everyday challenges in a new country. Among these are anxieties related to using unfamiliar communication technologies, which is why parents rely on their children to broker connections to ICTs more than with older technologies, such as television. According to Katz (2014b), brokering is a way for children to uphold the "immigrant bargain," which refers to children's efforts to repay the considerable sacrifices that their parents have made to raise them in the settlement country (Smith, 2002). Our second research question thus considers the range of motivations for second-generation youth to engage in transnational family communication and how their perspectives differ from their parents':

RQ2: How do children's motivations for engaging in transnational family communication align with or differ from those of their immigrant parents?

Method

The analysis presented here draws on data collected through qualitative interviews with 336 parents and children in three U.S. cities: Chula Vista, California; Tucson, Arizona; and Denver, Colorado. The three study sites were selected because their school districts serve predominantly lower-income,

Mexican-heritage families. In each site, we worked with two K–8 schools where school staff members helped us recruit randomly selected families. Families met the study criteria if they identified as Latino or Hispanic, if they had a child between the ages of 6 and 13 who received subsidized school meals,[6] and if they had any kind of Internet service at home. Because our broader goal was to measure the impact of initiatives that encourage broadband adoption, we limited participation to families with existing Internet access. Interviews were conducted between July 2013 and September 2015 by the authors and a team of trained bilingual graduate and undergraduate students. Parents and their children were interviewed separately, either at school or in their home, and in their preferred language. Each interview lasted between 45 and 60 minutes. Parents were compensated with $25 cash, and children with educational computer games provided by Sesame Street or a $15 iTunes gift card.

Interview protocols were guided by previous studies on technology adoption and family communication. Parents first answered fixed-answer questions that included demographic variables and measures of mediated and nonmediated family activities. Parents and children were asked complementary, semistructured questions about their decisions to adopt the Internet and related devices; to describe what changes connectivity has caused to family routines, and what having the Internet makes easier or harder for their families. Parents were asked about concerns related to their children using computers, mobile devices, and the Internet at home and at school, and children detailed their home media environments, which included identifying the devices they considered most important in each room.

Sample Demographics

We interviewed a total of 166 children and 170 parents.[7] The children were evenly distributed by gender, with a median age of 9, and 79% chose to be interviewed in English. By contrast, their parents were mostly women (91%), with a median age of 34. Only 40% chose to be interviewed in English, indicating a significant intergenerational language shift. Over a third (38%) of interviewed parents were homemakers; mothers indicated that they had decided with their spouse that quality childrearing necessitated a stay-at-home parent. These kinds of decisions required considerable financial sacrifice, as 62% of participants reported a total household income of $25,000 or less per year. Most of the parents were married (63%), and just over half (56%) had at least a high school diploma. Among the foreign-born parents who made up the majority (71%) of our adult participants, one-third had completed their schooling in the United States rather than in Mexico. This was one of the indicators that foreign-born parents were usually not recent immigrants; they reported having lived in the United States for a median 16 years and in their current neighborhoods for 8.

[6] Receiving free or reduced-cost school meals qualifies families for participation in a number of digital equity initiatives targeting low-income families, including the national Connect2Compete initiative (http://everyoneon.org/about/c2c/).

[7] Four children across the three sites opted not to participate in the study. We take this as a good sign that children understood that their parents' consent did not obligate them to be interviewed.

Data Analysis

Our corpus of data for analysis included verbatim transcripts of interviews with parents and children as well as detailed field notes that researchers compiled immediately after each interview. These documents were organized and coded in Dedoose, an online platform for collaborative qualitative data analysis. We followed a grounded theory approach (Strauss & Corbin, 1998) by beginning with open coding, followed by axial coding, and, finally, selective coding.

The open coding stage involved breaking down data to identify and name emergent categories (Creswell, 1998; Strauss & Corbin, 1998). Transnational communication activities, broadly defined, emerged as a clear theme, both as a motivator for technology adoption and as a driver of a range of family experiences with ICTs. Axial coding involves analyzing the emergent themes (LaRossa, 2005; Taylor & Bogdan, 1998), which in this case involved particular moments that prompted tech adoption for episodic and routine transnational communication as well as convergence and divergence between parents' and children's accounts of transnational communication. Finally, selective coding involves developing a coherent explanation of findings by connecting categories refined by axial coding (Creswell, 1998; Strauss & Corbin, 1998). The next section presents our findings from this last stage of analysis.

Findings

Parents' Perspectives on Transnational Family Communication

During their interviews, we asked parents to think about what having Internet service at home makes easier, or more difficult, for their family. Parents routinely described how their home Internet service makes it easier to access online resources for specific needs or interests (e.g., help with homework, health-related questions, maps, news, and local events). Concerns about being connected at home centered mainly on the risk of children accessing inappropriate content and the potential for technology to disrupt family time. These perceptions of connectivity's costs and benefits are consistent with previous research on how parents negotiate technology's place in family life (Livingstone, 2009; Livingstone, Haddon, & Görzig, 2012).

What distinguished our interviews from earlier research, however, was the value that immigrant parents place on the affordability of technology for goals related specifically to maintaining transnational ties. In this sense, affordability is not simply a structural factor in the form of cost but also a motivational driver, based on the opportunities for transnational family communication that ICTs can afford. Many interviewed parents noted that Internet connectivity provides affordable ways to communicate with friends and family in Mexico through Web messaging, social media, voice calls, videoconferencing, and photo sharing. Parents' motivations to maintain transnational contact thus shaped their adoption decisions and the nature of their subsequent appropriation of various ICTs. These motivations coalesced into three main themes: virtual intimacy, emotional support, and transnational caregiving.

Virtual Intimacy

Just as international phone calls were heralded as the social glue of transnationalism a decade ago (Vertovec, 2004), digital ICTs are now providing opportunities for forms of transnational family communication that look and feel different to users. Such interactions can help sustain family continuity through virtual copresence (Furukawa & Driessnack, 2013; Rudi et al., 2015) and, in some cases, a sense of virtual intimacy (Diminescu, 2008; Georgiou, 2006).

For example, Angelica and her husband recently purchased their family's first desktop computer as a Christmas gift for their 10-year-old daughter. They also signed up for a digital equity program called Internet Essentials, which provides low-income families with discounted broadband Internet service for $9.95 per month. Despite her limited experience with technology and her uneasiness about having Internet at home (she worried about how much time her family would spend online and whether they would have access to inappropriate content), Angelica described a family-driven adoption process with transnational communication priorities at its core:

> Interviewer: How did you decide to purchase a desktop computer recently?
> Angelica: Well, my daughter had been asking for one for a long time, and we kept telling her to wait until we could afford one. So we finally did, and we gave it to her for Christmas. Then my husband called to sign up for the Internet.
> Interviewer: And what was it like when your family first got the computer and Internet service at home?
> Angelica: Well, the only ones that use it right now are my daughter and my husband. She likes to watch videos, Disney shows, and things like that. My husband uses the Internet to talk with his parents in Mexico. And, well, that's one of the reasons why we got the computer, so he can speak to and see his family. So they can have conversations, and actually see each other instead of just talking on the phone.

Although Angelica's own engagement with the new computer was limited, she recognized its value to her husband in being able to connect with relatives in Mexico after 14 years apart. This ability to *see,* rather than just *hear,* family members in other countries, as Angelica described, motivated ICT adoption for many interviewed parents. Beyond the initial decision to purchase a home computer or obtain Internet service at home, parents described exploring the affordances of such technologies in order to engage in richer interactions with their loved ones. Web-based video platforms have indeed enhanced long-distance communication, facilitating more immediate and visual experiences than may have been possible with asynchronous options (e.g., e-mail, text messages, letters). Parents reported how meaningful this virtual intimacy is when they or their partners are unsure whether they will ever see their loved ones in person again, as was the case for participants whose movement is restricted by undocumented residency or financial hardship. As Georgiou (2006) describes, the sharing of intimate everyday experiences can reinforce a sense of belonging; for transnational families, a sense of belonging is crucial for family continuity and connectedness. As such, the initial reservations that many parents expressed about introducing ICTs into their household appeared to have been mitigated by their

evaluations of the opportunities that Web-based platforms, and videoconferencing applications in particular, afforded their family.

Parents with children who had remained in the care of relatives in the home country volunteered ways that they were exploring videoconferencing platforms to promote family continuity. It is in this context of transnational parenting that the need for virtual contact seemed to have the highest stakes. Mariana, for example, decided to obtain Internet service at home only two months ago. She gave two reasons for this decision: first, so that her children could go online while doing homework and, second, so that her daughter in Mexico could engage with the rest of her family in Arizona. "Since my daughter is in Mexico," Mariana described, "we use [the computer] to communicate with her, and that makes me feel like we're all here united, talking with her and seeing her. We feel much more at ease." Virtual copresence thus served as a compelling motivation to try new forms of communication that could both foster family unity and provide comfort to families that were geographically separated.

Emotional Support

Transnational family communication can also have significant implications for mental health and well-being. Digital ICTs, and social technologies in particular, have the potential to buffer the effects of social isolation and loss that are often a reality of the immigrant experience (Bacigalupe & Cámara, 2012; Baldassar, 2007; Nedelcu, 2012). Our analyses revealed that frequent virtual exchanges with family and friends in Mexico helped many immigrant parents negotiate extended separations from their loved ones. Parents described how mobile chat applications and social media helped them maintain everyday interaction that often served as emotional support.

Eduardo, for example, is originally from Tijuana, Mexico, and has been living in San Diego, California, for almost 10 years with his wife and three sons. Although the rest of his family lives only 12 miles away in Tijuana, he is not able to visit them; he implied that cross-border travel is precluded by his lack of legal documentation. Given these realities, Eduardo, like many other parents we interviewed, considered the Internet and social networking platforms like Facebook a valuable way to sustain routine and immediate connections:

> Interview: In your opinion, what is the Internet most useful for?
> Eduardo: Now everything is about technology. People don't really send letters in the mail anymore because it takes too long. You can send an e-mail and it reaches them right away. I have a Facebook account, for example, because I am the only one in my family that lives in San Diego. Everyone else is in Mexico, so that is my way of chatting with my sister and my mom. So that's why I like having it.

Eduardo described feeling isolated as the only member of his extended family living across the border, but he felt the educational opportunities for his children in the United States made his sacrifices worthwhile. Regarding newer ICTs specifically, Eduardo was ambivalent about being active on Facebook (a sentiment many other parents shared), but he had created an account anyway to feel closer to his mother and sister in Mexico. Eduardo was optimistic about the affordances of technology for his children's

education and for maintaining his family relationships. He evaluated the costs and benefits of having a Facebook account and ultimately decided that he would use the platform because it provided an opportunity to communicate with his family.

The popularity and permeability of Facebook, which currently has 1.04 billion active daily users, 84% of whom live outside the United States and Canada (Facebook, 2016), has arguably made the platform the new social glue of immigrant transnationalism. With its user-friendly interface and personalized algorithms that are designed to diversify and amplify social networks, Facebook helps to bridge social distance in an immediate, immersive way. This virtual immediacy was a source of emotional support for many parents, who were using Facebook to reestablish and revive personal relationships that had been disrupted by migration. Teresa, for example, is from Mexico and has been living in Denver, Colorado, for about 10 years; she described how reconnecting with friends through Facebook brings her happiness:

> Interviewer: You mentioned that you mostly go online through your smart phone. Are there any specific applications that you have found helpful?
> Teresa: Well, Facebook helps me find friends that I haven't seen in a long time. That has helped me out a lot and gives me a lot of happiness. I can see photos of my family that I haven't been able to see in many years.

In addition to Facebook, mobile applications such as WhatsApp and Kik have shaped how immigrants interact with loved ones in their home country. As Rocio described, being able to share videos, photos, and send text messages for free, from anywhere, and anytime, has made routine cross-border communication a reality:

> Rocio: I have an app that is very important to me; it is called WhatsApp. Because I have my family in Mexico. So they don't have to spend money and I don't spend money when I talk to them. With that app nobody has to pay for the messages.

Many parents felt that it is just as important for them to have an affordable way of reaching relatives back home as it is for their relatives to be able to reach them when they do not have the financial means to make long-distance telephone calls. Adopting new devices and engaging digital platforms is thus motivated by desires to connect with others, and such connections help individuals cope with feelings of disconnectedness that result from migration. However, while ICTs can foster a sense of copresence during both routine and episodic interactions, they can also reinforce feelings of loss or disconnectedness, particularly when immigrants are trying to secure the well-being of their loved ones abroad.

Transnational Caregiving

We found that fluid transnational interactions via ICTs become even more valuable to immigrant parents when a family member's well-being is threatened. Parents discussed the importance of being able to check in regularly during family emergencies. Checking in was difficult and expensive when it required

multiple long-distance telephone calls, but free digital platforms have made transnational caregiving a more fluid (albeit still limited) process. Carolina, for example, emigrated from Mexico 11 years ago; she first arrived in Sacramento, California, and decided to relocate to Denver a few years later with her husband and 9-year-old daughter. Carolina is not a very active computer user, but she does use Facebook and WhatsApp to share photos and videos with family in Mexico. Although she is not too fond of Facebook, Carolina said the only reason she has an account is "for the family, so that my daughter can get to know her family because we don't have anyone here in Denver." During her interview, Carolina shared a story about why her family decided to bring a computer, and subsequently Internet service, to their home:

> Interviewer: What made you decide to purchase your family's first computer?
> Carolina: Well, it's something very sad. My husband had an accident. He was robbed and beaten badly . . . he could barely move or eat, and couldn't work for almost six months. During that time we made the decision to buy the laptop because my mother-in-law wanted to see him. Since we don't have our papers . . . when we told her what happened she insisted on seeing him to make sure he was okay.

Carolina's mother-in-law lives in Mexico, and when this incident happened, the family began communicating with her through video chat. During these chat sessions, they were using one of their smart phones as a mobile hot spot, but it was a very slow connection. A year later they decided to sign up for the $9.95 Internet Essentials offer. But when they did this, they had to forego cable television because they could not afford to pay for both.

The family faced a unique moment of crisis that prompted the introduction of digital technology into their home, but their experience speaks to the potential for transnational communication to buffer the emotional effects of separation (Bacigalupe & Lambe, 2011; Baldassar, 2008). Being able to *see* versus just *hear* loved ones becomes even more critical when a family member's health is in danger. The family addressed an explicit need to calm anxieties on both of sides of the border by establishing a method of verifying the well-being of a family member. In this case, the need to engage in transnational family communication was heightened because of a family tragedy, and the concerns of family in Mexico prompted the adoption of technologies in the United States. Beyond the initial motivation for adoption, Internet access at home becomes a valuable resource for Carolina as she relies on online applications to sustain her own family relationships and to bridge the growing distance between her daughter and their relatives in Mexico.

Children's Perspectives on Transnational Family Communication

Akin to how transnational communication practices emerged organically in parents' interviews, children elected to answer a range of questions with references to their families' technology use to maintain cross-border ties. For example, when asked what having Internet at home made easier for their families, children frequently said that connectivity helped their families stay in touch with relatives in Mexico via Facebook, Skype, FaceTime, and WhatsApp. Children's accounts of their families' transnational communication practices clearly reflected their understandings that regular connections to loved ones in Mexico emotionally sustained their parents. Consistent with previous research on children of immigrants,

the children in this study understood that their parents' migration had meant sacrificing regular face-to-face interactions with their loved ones and that these sacrifices impacted their parents' happiness and well-being (Katz, 2014b; Louie, 2012).

For example, Liliana (age 9), feels that having Internet at home makes it easier for her mother to stay closely connected to her mother-in-law and grandmother-in-law, both of whom are in poor health. Liliana also emphasizes—not once, but twice—that these relatives do not know her and her U.S.-born siblings, because her parents' documentation status prevents the family from visiting Mexico. In this exchange, Liliana makes it clear that transnational communication serves crucial functions for her mother by enabling her to maintain even limited capability to care for ailing loved ones. Conversely, she is aware that losing this form of connectivity would negatively affect her mother's emotional well-being. She also emphasizes a generational distinction with relation to maintaining transnational ties, because Liliana and her siblings feel quite detached from these exchanges.

> Interviewer: What are the kinds of things that you think having Internet at home makes easier for your family to do?
> Liliana: I think it helps my mom by talking with my dad's grandma and his mom. . . . They're somewhere in Mexico. And they, they really don't know us, 'cause we were born over here [after] my mom, like, came over here. So my mom came over here and that's when we were born, and so they don't really know us. [My mom] talks to them on Facebook.
> Interviewer: And on the other side, is there anything that you think not having the Internet at home can make harder for your family?
> Liliana: I think it would make my mom's life harder because she wouldn't be able to connect with my grandma or grandpa over there, and they wouldn't be able to talk with each other.

Children generally felt less committed to maintaining close transnational ties than their parents did. This pattern, whereby immigrants feel more tied to their homelands than their children born and/or raised in the settlement country, is consistent with the broader transnationalism literature. The New York Second Generation study, which collected data from 3,415 children of immigrants from China, Colombia, the Dominican Republic, Ecuador, the former Soviet Union, Hong Kong, Peru, Taiwan, and the West Indies who were raised in New York City, is the most definitive study on this issue. Kasinitz, Mollenkopf, Waters, and Holdaway (2008) document considerable decline in second-generation transnational ties, except among young people who have returned to their parents' country of origin for extended lengths of time (generally years) during their childhoods. Still other scholars have debated whether meaningful transnational activity survives beyond the immigrant generation (e.g., Soehl & Waldinger, 2010; Waldinger, 2013; Waldinger & Fitzgerald, 2004). Among our participants, children were generally less invested in these exchanges with Mexican relatives, because, as Liliana notes above, they did not, or could not, travel to Mexico to visit (and vice versa).

In many ways, the exceptional cases reflected the general rule, in that the few children who regularly traveled to Mexico to visit with relatives maintained intensive transnational ties with cousins and

other relatives, because they were personally driven to do so. For example, Javier (age 9) lives in Chula Vista, which is located just north of the U.S.-Mexico border in California. His family's documentation status allows frequent visits to family in northern Mexico; Javier had gone camping with his cousins there the weekend before his interview. He talked about writing e-mails, sending texts, and FaceTiming with his cousins, aunts, and grandmother in Mexico, and said that his cousin, also named Javier, "always texts me." Javier's regular cross-border visits sustained close connections to his relatives, and these relationships were augmented through digital interactions.

Most interviewed children either saw their relatives infrequently or had never met them. As a result, their communication with relatives in Mexico usually occurred because parents directly requested their involvement in Skype chats or Facebook exchanges rather than because children had initiated contact themselves. For example, Melissa (age 10) said that having Internet access at home makes it easier for her family to "communicate with other people. Like, my mom has Facebook and sometimes we talk to my aunt in Tijuana. [My mom] says, 'Let's go on it so we can talk to our cousins.'" Like Melissa, many children indicated that their parents prompted them to connect with their cousins, aunts, uncles, or grandparents by sharing photos, sending Facebook messages, or via conversations using Skype or FaceTime. Although some children enjoyed these interactions, others felt pressured by their parents to talk with family members they hardly knew. Some confided that they felt frustrated when their Spanish-language proficiency was too limited to facilitate easy interactions. From children's retellings, parents put considerable effort into making their children feel connected to relatives in Mexico, but such feelings were elusive, especially for younger children.

The limited connections that children felt to faraway relatives was offset, especially for older children, by their understanding of how much their participation in these interactions meant to their parents. Knowing that their parents would be happy if they came willingly to participate in these interactions when asked was a good enough reason to do so for most children. Their compliance can be considered, in effect, a mediated component of upholding the immigrant bargain (Louie, 2012). Many children also frequently brokered their parents' connections to media and technology, meaning that they facilitated their parents' connections to the computer, logged them on to Facebook, or connected them to Skype. As a result, transnational communication activities became collaborative experiences in many families.

For example, Catalina (age 14) referenced her families' transnational communication activities throughout her interview. Her repeated references to "us" and "we" reveals that these were collective experiences for her parents, siblings, and grandmother who lived with them. When asked what having the Internet at home makes easier for her family, she said, "That's the way we communicate with the family from Mexico instead of calling them. Because sometimes we can't call them, because you have to get a [calling] card, and we can talk to them on Facebook or Skype with them. It's easier for us." Catalina felt that Facebook made it easier to maintain close connections to family in Mexico, but it wasn't the only application they used to do so. She said, "Even with Facebook, we have Kik. You know what Kik is, right? That's how we message each other too . . . my cousins and my *tios*."[8]

[8] Translation: aunts and uncles.

Catalina divulged more details about her family's collective use of Facebook for transnational communication later in her interview. In describing the practice of sending Facebook messages with Mexican relatives, she said,

> Usually on Facebook, there's a lot of Spanish [messages] to my family, and if I don't understand a word, my grandma is usually with us, so she helps me. She helps me. Like, I know how to read everything [in Spanish], I just don't know how to write it.

Catalina's description reflects broader practices of intergenerational technology engagement in these families (Katz & Gonzalez, 2016a); Catalina logs on to Facebook and types messages on behalf of the adults in her family, but her grandmother's language capacities augment Catalina's own limitations in written Spanish to facilitate those ongoing interactions with family in Mexico.

Implications and Conclusions

As immigrant parents manage the costs and benefits inherent in the daily realities of migration and settlement, they consider the affordability of different means to mitigate costs and to accentuate benefits. Increasingly, those means include digital technologies that provide opportunities to develop and maintain virtual intimacy with faraway relatives; to secure emotional support from them that can mitigate effects of social isolation in the host country; and to provide opportunities to engage in transnational caregiving, in both directions. Our qualitative data reveal that immigrants' motivations to engage in transnational family communication drive their decisions to adopt ICTs. But such motivations do not merely drive adoption decisions; they also facilitate a process of appropriation that occurs as families negotiate the affordances of particular devices and platforms based on their needs.

Transnational family communication emerged as an important factor shaping technology adoption, but one limitation of our study was that we intentionally recruited families that had Internet service at home. Future work in this area might also include less-connected families to more closely examine directionality in the relationship between transnational communication and technology adoption. We also did not ask our participants questions about transnational communication specifically, because this theme was unanticipated in the original research design. More purposive interview questions on the topic may yield additional insights into the use of digital ICTs for transnational family communication.

These limitations notwithstanding, the large number of interviews we conducted and the nature of our research design make us confident in the emergent themes we have identified. To the degree that transnational communication motivates ICT adoption, these practices hold promise as avenues for developing tech-related skills and the kinds of meaningful digital connections that are becoming increasingly important as more information and resources migrate online. Although the numbers suggest that Latinos are adopting mobile devices and broadband Internet at higher rates than ever before, deeper investigations into the why and how of technology adoption and appropriation can inform programs and policies that promote digital literacy and equity. Such investigations, Benítez (2006) argues, "could propose the creation of public policies in the realm of the Internet and ICTs for promoting accessibility and

knowledge skills" (p. 184). As such, transnational communication may be a useful springboard for examining as-yet unresolved digital equity issues among U.S. immigrant populations.

Furthermore, by interviewing parents and children—and doing so separately—this work contributes to the broader transnationalism literature, in which studies have focused extensively on single generations. Our findings reveal that transnational communication activities are often collaborative experiences between parents and children, reflecting the need to consider transnational communication events as intergenerational rituals. In addition, the distinctions between parents' and children's perspectives on what transnational communication activities mean to them provide important insights into immigrant family dynamics more broadly. Parents' involvement in transnational activities is a direct manifestation of their deep investment in remaining close to faraway loved ones. This investment is often prompted by a need for closeness or a desire to engage in long-distance caregiving.

Finally, it is important to note that the children of immigrants are integral to this process of technology adoption and appropriation for the purpose of transnational family communication (see also Katz & Gonzalez, 2016a, 2016b). Parents and children alike emphasized how children broker their parents' connections to devices and platforms that parents utilize to maintain transnational ties. Children are not, however, merely conduits for parents' connections; our analyses reveal that they are also active participants in these interactions. Their *involvement* in these transnational communication practices, however, is distinctive from their *investment* in them. Children's involvement in transnational activities is more likely to be a demonstration of their investment in their parents' happiness than of their desire to remain close to relatives. In this way, our data identify a digital component to how children of immigrants honor the immigrant bargain (Louie, 2012); that is, how children work to reduce the relational costs of their parents' decisions to migrate by facilitating their connectivity across borders. Such intergenerational insights make significant contributions to the study of transnationalism and family communication in the digital age.

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