

# Families Divided by Distance: The use of technology products by immigrant Latinos in a new growth area

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## ABSTRACT

We are interested in developing technology to aid in the plight of families divided by distance. We look at the case of Latino immigrants as an example of cultural and emotional dependence on their friends and family abroad. Our goal is to aid in the acculturation process of immigrant families in the United States. We have identified overlapping points of interest in acculturation, technology on the fringe, and the immigration of Latinos. Though both a pilot study and our ongoing work we illustrate our findings. Our findings to date have shown two things: first that use of technology is proportional to the level of adjustment in their new home in the United States, and second we show how there are several different segments of this population with diverse characteristics. Being that face-to-face contact is at a minimum, technology becomes even more important to build and maintain one's social network in these new growth areas. The Pittsburgh area is a new growth area for Latino immigrants, which means that the population is so spread out that they do not have a community to turn to. We are looking at immigrants' adaptation to their new environment by appropriating technologies to maintain, build and extend their social networks as they work toward citizenship or whatever their chosen goal may be. We are interested in understanding how technology might be developed to help immigrants' adjustment to their new lives in the United States. We present a model for designing technology for this audience.

## Author Keywords

Underserved populations, social networking, immigrants, acculturation, communication technologies, social networks

## ACM Classification Keywords

Miscellaneous.

## INTRODUCTION

In today's world most of us are living in families divided by distance; we have loved ones at war, left behind in other countries, or even far away in our own country. Many of us use technology products to keep in touch with our extended families, using things such as email, messenger, video chat and others. Immigrants however, are a specific case of families divided by distance. These people not only are communicating with family and friends back home, but they are depending on them for social and emotional support as they transition into a new place and new culture. Given their state of transition immigrants prove to be an interesting population for study. We have chosen to study Latino immigrants because they are additionally transitioning from very diverse social structures, moving from a collectivist society to an individualist society [Triandis]. The Pittsburgh area is particularly interesting in that it is a new growth area for Latinos. Given this, there is even more of a strain on their existing social structures than in a standard big city Hispanic community. As a typically lower-middle to lower class demographic their access to technology is limited. However they are beginning to utilize low cost widely available technology products to scaffold their social networks.

We approach this investigation from a design-focused point of view, addressing this "wicked problem" comprised of overlapping topics in three diverse fields of study: immigration, acculturation, and technology on the fringe. As described by Rittel in 1973, a wicked problem is one that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements where there is no one clear correct answer [12]. In our case our problem is comprised of overlapping areas of context. The common interest across these fields of study is adjustment of a people to their surroundings in such a way that their cultural needs are supported and accessible. We are going to describe these three fields as they apply to our research.

## Immigration

Immigration is the action of migrating to another country, usually for permanent residence [4]. Typically immigrations happen in waves and immigrants of the same nationality settle together in enclaves. A major Latino center is an area in which there is a stable and flourishing

Latino community, such as New York City, Los Angeles, Miami, and Chicago. In contrast, a new growth community is one in which the Latino population is highly dispersed, yet growing rapidly. One of the characteristics distinguishing new growth from major centers was the limited availability of “safety-net providers” within new growth communities. [1].

Pittsburgh is a new growth area for Latino immigrants. In the last 10 years the Latino population of the Pittsburgh area has grown by 44% to yield an estimated 20,000 Latinos in the Pittsburgh area. However, the population of greater Pittsburgh is considered invisible because it is not concentrated within one geographic area. [1]. Up until the end of the 20<sup>th</sup> century, unskilled labor jobs were filled by laid off steel workers in the Pittsburgh area. However now that most of those have either passed away or retired there is once again a need for cheap unskilled laborers, particularly in the restaurant business.

The population is invisible not only to the preexisting community, the dominant white population, but also to the immigrant community itself. Research has shown that access to social networks, usually consisting of family members and or friends that have been slowly acquired over their duration in the States, is directly related to their access to services. Given this, these immigrants have very sparse social networks to turn to. New residents often have few contacts and so in turn have very poor access to social services. [0].

### **Acculturation**

A simplistic definition of acculturation suggested by Ruiz (1981) states that acculturation involves giving up old ways and adopting new ways. Others have described it as the “extent to which ethnic-cultural minorities participate in the cultural traditions, values, assumptions, and practices of the dominant [White] society” [11, 13]. In medicine, acculturation refers to the degree to which a people have adjusted to a new social, physical, and cultural environment. This is largely a result of the status of their social network both in their new home and abroad. Acculturation is a powerful determinant of attitudes and behaviors and it affects many aspects of child and family functioning [15]. Up to this point, the majority of research into acculturation has been done in the medical domain.

In the case of the Latinos in the Pittsburgh area, acculturation has been measured by a number of factors including control of the language, cultural expectations, social network and education level [5].

The Pittsburgh Latino population’s lack of social network and access to social services results in a retarded acculturation. They lack access to health care, language classes, and insurance. Additionally, due to their lack of social networks there is an epidemic of depression, loneliness, drinking, and difficulty adapting to daily life

[Laura Macia and P. Documet]. Ultimately, this population is adapting more slowly to their new home in the United States than would typical immigrant Latinos in old growth areas.

Our work differs from that of an anthropologist or sociologist in that we have a particular focus on the role technology plays, or may play, in developing and maintaining social networks rather than looking at the networks themselves.

### **Technology on the Fringe**

In recent times, HCI has begun to take on fringe demographics in order to support the underrepresented and non-tech-savvy. Developing technology for populations that have not traditionally used technology expands the potential horizon of possibilities. We have seen that we can learn about the potential of technologies for the general population by studying the extremes and the under represented. For example, Wyche et. al describe how mega-churches use large screens and other technologies to support their services. She suggests Spirituality as another lens through which to understand collaboration and coordination of everyday life. [21]. LeDantec et al studied how homeless people utilize technologies to maintain and preserve their values and identity. This served as a means of illustrating the social impact of technologies. Their paper showed how in using technology to redefine boundaries, we have an opportunity to do so inclusively, bringing the periphery into sharper focuses, inviting in the disenfranchised and the under-served [8]. Troshynski et al presented the life of the incarcerated on parole as a means of illustrating the accountabilities of location based systems [18]. Woodruff et al exhibited how the orthodox Jews use of technologies to maintain the Sabbath day by also be put into play to reinforce green practices. [20]. Parette et al has demonstrated the effects of acculturation on assistive technology service delivery may also be applied to technology services to the general public [11]. Each of these studies were able to offer a new perspective on the capabilities and applications of existing technologies for the general public; there is a strong trend that fringe ethnographic research will yield this kind of useful result. Creating products to assist impoverished fringe demographics will help to create technologies and products that may benefit everyone in the general public.

As a methodology ethnographic research is centered on the point where goods and services meet applicability. Additionally, fringe demographics usually only have access to the cheapest and most lightweight of technologies, and these are the most easily repurposed.

We follow in this tradition though our study of Latino immigrants’ usage of technologies to help mitigate and support the acculturation process. We see that Latinos utilize technologies to support their strained social networks as they move forward. Social networks are necessary to have adequate accessibility to social services [1]. Social

networks are also a key aspect of the acculturation process, which is necessary for the accessibility and use of social services such as clinics and family services [1, 5].

### CONTEXT OF THE RESEARCH

Our fieldwork is being conducted in the Greater Pittsburgh Area in Southwestern Pennsylvania. It is a predominantly white community of European descent. However there is currently a large influx of Latino immigrants, particularly from the state of Guanajuato, Mexico [3]. This is what is known as a “chain migration” where an entire community begins to uproot and relocate to a new area. The majority of this population is coming to the Pittsburgh area as unskilled laborers to work in the construction, cleaning, and restaurant business [3, 9]. They are moving to Pittsburgh because the big cities such as Chicago and New York are overflowing with immigrants and there are not enough jobs. By word of mouth they have heard that there are jobs and cost of living is cheaper in the Pittsburgh area. Being that the immigrants are not being hired by some singular entity, they are forced to settle in a dispersed pattern throughout the area. This situation has left them with a poor structure for social support. For those who have access, in order to support what little structure they do have they are dependent on technologies such as cell phones and the Internet.

### RESEARCH QUESTIONS

By combining these three areas of study we hope to answer the following questions:

- How do Immigrant Latinos in a new growth area use technology products?
- What is the relationship of technology products to their social network?
- What role does technology play in the acculturation process?
- What are the key factors for acculturation in new growth areas?

We employ qualitative methods and grounded theory to address these questions.

### METHODS

We conducted a number of semi-structured interviews of participants in the Pittsburgh Area. Our protocol questions were formulated from literature review and from pilot interviews with informants. We recruited four participants through the Pittsburgh Hispanic Center, three females and one male ranging in age from 26-34. Participants lived in Squirrel Hill, Shady Side, and Robinson. Participants were met in public places such as public libraries and coffee shops. The protocol consisted of a number of questions in three categories, their life at home and abroad, communications at home and abroad, and products at home and abroad. Each interview was approximately one hour long. Interviews were recorded and transcribed for coding.

### ANALYSIS

While there is research on acculturation, technology on the fringe and immigration, the combination of these has not been studied. These fields offer a unique social and technical perspective that speaks to the needs of a large audience. Acculturation offers the opportunity to look at individual networks and relationships to technology. Technology on the fringe offers us a fresh perspective to view existing technologies, while immigration provides us with a large audience that the United States as a whole can identify with, (as we were all immigrants at one time). By considering these factors together we are able to create a holistic view of their interactions and relationship with our demographic.

While some research, such as Parette’s research on acculturation and assistive technology, presents examples and identifies the role of acculturation in the use of technology, it is only an initial look and has called for more research in the field [11]. This is characteristic of nascent theory, meaning little or no previous theory exists [6]. We follow the framework described by Mutlu et. al to guide our approach to nascent theory [Mutlu, 2008]. Weick highlights the importance of grounding nascent theory in the experiences of those living with or creating the phenomenon [19]. These experiences are best captured through qualitative methods such as ethnographies, observations, and interviews and used to build empirically grounded theory [14]. Through this process, key constructs are identified and described, the relationships are explained, and findings are contextualized for future testing theory and or informing design decisions [7].

Our methods include ethnographic data collection, grounded theory analysis and theory building. We chose a grounded theory approach to identify social actors and how their relationships and interactions construct reality [7].

We analyzed the interview transcripts using a grounded-theory approach as suggested by [Corbin and Strauss]. The process included open coding, axial coding, concept evaluation and the generation of a model. We explain this in detail below.

Open coding is the first coding activity. Concepts that are significant as abstract representations of events, objects, relationships, interactions, etc. are identified and coded [1]. For example:

‘Yes, my mother prepared desserts for me and remember when my father, my mother went to the museum, and remember when I went to the elementary school with my other sister. [“reminiscing”] [“people\_home\_family”].’

In the example above, an informant recounts memories about her family when she was young. The response is coded as “reminiscing, people home family” due to her recounting experiences about her family. The open coding process created a total of 30 loosely connected concepts

with descriptions and dimensions for each. We did not conduct a reliability analysis for this pilot work.

**Axial Coding**—In the second step of analysis, concepts created by open coding are categorized into explanations of arising phenomena. In the context of grounded theory, a phenomenon refers to repeated patterns of events, happenings, actions and interactions that represent informants’ responses to the problems and situations the encounter in a social context [16]. “Reminiscing” for instance is a phenomenon as it represents a pattern of behavior shown by informants when they are asked to talk about their family abroad. The outcome of our axial coding was a total of 11 categories.

**Selective Coding/ Model Building**—This is the last step of coding where categories are integrated into a central paradigm. The goal is to assemble a “big picture” of the findings by building relationships across categories and constructing a theoretical model to be contextualized in the data.

**Comparative analysis**—The central phenomena that arose from out that was that people’s degree of adjustment into their new lives in the United States was directly related to 11 major factors. These factors include product access, time in the United States, economic status, social place, physical place, sense of self, people (both at home and away), and their relationship to technology. With this model we can begin to understand “how” these factors influence people’s experiences by conducting a comparative analysis. We will be able to compare how a respondent’s adjustment is affected by these factors. While none of these things

function in isolation it helps to view them as individual factors in order to understand their relationship to the phenomena. Communication technologies support the social networks that seem to serve as scaffolding towards adjustment in their new environment

**PILOT RESULTS**

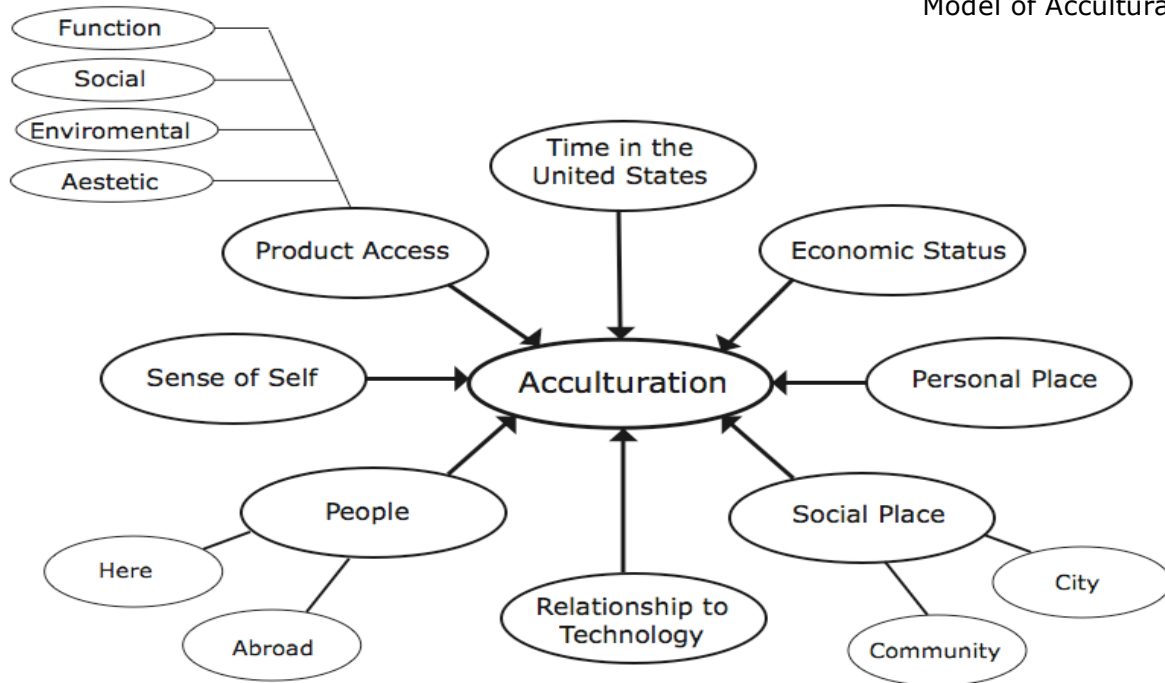
Our results indicated that a number of factors work in concert to determine the degree of adjustment a respondent has in their new place in the States. These factors include *product access*, *time* in the United States, *economic status*, *social place*, *personal place*, *sense of self*, *people* (both at home and away), and their *relationship to technology*. Below we describe each of these factors and list the pilot participant numbers who illustrated these concepts.

*Product access* – Product access determines what means a participant has of communicating with their social network. For example, while the respondent may have an adequate internet connection, their family may not, which restricts communication [participant 2, 4].

*Time* -- Our interviews have shown that there is a time period of one to five years when a new immigrant is adapting to their surroundings that communications with their family abroad are particularly difficult. The longer the respondent has been in the United States, the more likely that they will have stable access to communication [participant 2, 6].

*Economic status* – Economic status often determines other factors such as access to products and relation to technology. Higher status immigrants such as students are usually much better adjusted because they are able to maintain their social networks here and abroad very easily

Model of Acculturation Factors



[participant 4, 6].

*Social place* -- Whether the participant is in an old growth social community with a strong pre-existing community of other immigrants, or if they are in a new growth community with very few contacts, also plays a large role in their adjustment to a new place. The more of a social network they are able to maintain, the faster they will be able to become adjusted [participant 2, 3, 4, 6].

*Personal place* -- If the participant is out alone in the suburbs without a community location they are far more likely to feel isolated and alone than if they are in a more urban community [participants 2, 3, and 6].

*People* (in the United States) -- Whether or not the participant is able to identify with the surrounding community also plays a large role in their ability to adjust. One participant felt that being a Steelers (Pittsburgh football team) fan brought her closer to the city and made her feel more at home [participant 2].

*People* (at home) -- Having a social network both at home and away affects how well adjusted a participant will be in their new place. Due to a social fallout, participant 4 had little to no communication with her friends and family abroad, which made her transition to Pittsburgh's new growth area very difficult and lonely [participant 4].

*Relationship to technology* -- Awareness of technology plays a large role in the participant's ability to build, maintain and extend their social network. In cases where participants are not aware of such services as VOIP (voice over Internet Protocol), communications can be cost prohibitive.

While none of these things functions in isolation, it helps to view them as individual factors in order to understand their relationship to the phenomena. Our model provides insight into the holistic picture and all of the social, physical, functional, and emotional factors determining use. Our model enables designers to consider the dynamic relationship of factors when considering this demographic.

Communication technologies support the social networks that seem to serve as scaffolding towards adjustment in their new environment. While immigrant social networks in a new growth area may be weak, scaffolding through technology products may support the transition process and acculturation.

### **Summary of Pilot Research**

From our pilot research, we were able to develop a design model of the dynamic factors of acculturation. We will take this model and apply it to our future work to see if it stands up against further study. Additionally, we recognized a coincidence of tech savvy and acculturated participants. In our research we aim to test our model against new instances as well as test our theory that tech savvy are particularly more acculturated than others.

### **STUDY RESULTS TO DATE**

Participants are being recruited both through the Pittsburgh Hispanic Center and through word of mouth. To date we have interviewed nine participants in their homes. Our goal is fifteen participants. So far, we have been able to apply the model derived from our pilot results to our current results. Our model continues to describe the relationship between the 8 major factors of acculturation. We will provide examples of each factor below.

*Product access* -- Access to technology products in particular has a huge impact on acculturation; we will discuss this in the *relationship to technology* section below. Product access also includes things such as pictures and other possessions brought from home in order to remember friends and family and to maintain closeness to them. Many of our interviews were not able to bring any personal items with them when they crossed the border. To supplement this they often call for their family members to send them things, often pottery or foodstuffs. When asked what things remind them most of their country, all of our participants mentioned "food."

*Time* -- Participants who have spent less time in the United States are often far less acculturated. Participant 8M had only been in the US for 6 years. While she did have a family here, she did not have a grasp of the language nor any network in the United States.

Participant 7A had only been in the US for 3 years. He had no family and no social network other than his two roommates and his wife and daughter back in Guatemala. We have seen that typically the longer a person is in the US the more likely they are to have a family, a steady job and a social network, all signs of acculturation.

*Economic Status* -- In our interviews we have seen a wide range in economic status. For instance, participant 3E, was middle class, married to an American teacher and lived in a large beautiful house in Washington, PA. She had access to the full range of technology from cell phones to video chat programs. This kept her very connected to her social networks both abroad and in the United States.

On the other end of the spectrum, participant 2O was on the lower extreme of lower class. While he had a cell phone, he had little access to services and very infrequent interactions with family at home in Mexico.

*Social Place* -- All of our participants are from a new growth area. Because of this, the majority of our participants have a fairly limited social network within the Pittsburgh area and thereby have less awareness and access to services.

*Personal Place* -- In our more recent interviews, we're starting to see a pattern in personal place: more recent immigrants tend to live within the city getting odd jobs and trying to learn English; however, as they become more established with more secure jobs and or families, they tend to move out into the suburbs. This seems to be because

they feel they will be bothered less with legal issues and have a safer place for their family.

*Sense of Self* – Nearly all of our participants noted that they did not feel like they belonged or were a part of Pittsburgh during the first 1-3 years of their residency. However after spending more time in the area and developing more of a social structure and place, they began to feel like they belonged in the area. “I love Pittsburgh” was stated by a number of participants [participants 6R, 7A, 8M]. The people who had been here a shorter time such as 4J and 7A both expressed that they wanted to feel like they belonged in Pittsburgh, but could not just yet. While others such as 6R, 8M 9E felt that they were a part of the city and that they and their families belong.

*People* (both at home and away) -- Keeping connected to both people here in the US and in one’s country of origin is very important for a comfortable transition into citizenship. Most of our participants call family and friends at home every day of the week and often multiple times a day (with the exception of 2O and 8M who could not call daily for financial reasons). It seems to be a crucial part of maintaining their cultural identity and sense of family.

Maintaining relationships within the States, and particularly the Pittsburgh area, is important for hard questions and emergencies. A number of the people we spoke with said they would first turn to friends for these things [participants 1S, 3E, 9E]. However, those without developed networks said that they would go to the church or to the community justice advisor [participants 2O, 7A, 8M].

*Relationship to Technology* – Participant 8M walks to the public library with her children to use the Internet. While she has an email account for keeping in touch with social services such as the Hispanic center, she cannot use it to maintain contact with her family because they do not have the Internet. Instead, she will go to down town Pittsburgh and buy \$5 phone cards in order to call home to Mexico.

From another perspective, participant 4J had only his cell phone for keeping in touch with friends family and services, making him dependent on word of mouth. This left him far more alone and vulnerable. He kept in touch with no one from Mexico and had made no new friends in the United States. He lives in isolation with his family. When asked whom he would go to in the event of an emergency his only response was the church.

Access to a technology does not necessarily require knowing how to use it. Participant 7A used email to access information from the Hispanic Center, although he could not use a computer: he had a friend at work who would use the computer for him and relay messages about social services and potential jobs.

From these recent interviews, we see that our model of the dynamic factors in acculturation still holds strong. While they may not be exhaustive, they are definitely a strong start.

## **Participant Profile Vignettes**

By combining our experiences with our pilots and our ongoing study, we have seen a clear pattern of stratification among participants. Within the population, there are a number of different communities and several different segments. Below we characterize 3 main groups through a series of vignettes based on actual interviews. The three groups are *early immigrant*, *suburban family immigrant*, and *established immigrant*. We will characterize these groups in detail below.

### *Early Immigrant*

These are the immigrants who are in their first 1-3 years in the United States. They’re often working odd jobs and living in the more urban parts of the city.

Rodrigo is a 37-year-old immigrant from Guatemala. He has been living in the Pittsburgh area for about 9 months. He currently lives with a friend of his brother’s in Oakland. In his house there are four men: two of them are immigrants, and two of them are low-income Pittsburgh natives. The house is divided into two apartments. Rodrigo lives on the second floor with his flat mates. There are 3 bedrooms a kitchen/living room and a bathroom. A half wall divides the kitchen/living room. In the center of the room is a weight lifting set, and on the side is an old beat up couch. Rodrigo, as a guest of his brother’s friend, sleeps on the couch. While he was in Guatemala, he was a horse veterinarian, but here in the States he often does odd jobs like painting, construction, and lawn work. At the moment his English is not good, and so he goes to ESL classes at the public library once a week. On a typical day Rodrigo will get up at 6:30. He will either take the bus or walk and be at work by 7:00am. He works 10-12 hours a day. On Thursdays he goes to ESL at 6:30 in the Squirrel Hill public library. At 8:30 class is over and he goes home to watch some TV, shower and go to sleep.

While Rodrigo kind of likes Pittsburgh, he does not feel that he belongs and he misses his family and friends in Guatemala a lot. He’s very frustrated that he cannot speak the language and he still feels like people are staring at him when he walks down the street. He is not comfortable with the fast paced life in the States and longs for the slow life he left behind in Guatemala. At the same time, he’s really glad to be working and finally earning money to send home to his wife and daughter.

Rodrigo does not know a lot of people. He talks with his flat mates, but that is the whole of his network in Pittsburgh. He calls home to Guatemala on his cell phone two times a week at 8:30 p.m., using \$5 calling cards that he buys downtown. Outside of his housemates, his wife, and daughter, he does not talk to anyone.

The only thing that reminds Rodrigo of home is food. He did not bring anything with him from Guatemala but the clothes on his back. At this time he ultimately feels that he

will be returning to Guatemala and does not have many personal possessions.

In five years Rodrigo sees himself returning to Guatemala to live with his family. In ten years he feels that he will still be in Guatemala, possibly working as a veterinarian once again.

#### *Suburban Family Immigrant*

These immigrants have been in the states somewhat longer than the early immigrants. Usually they have either called for their family or have started a family since establishing themselves in the US. They are usually on the higher end of lower class and have steady jobs of some kind. Many of them work in food service or in construction in the Pittsburgh area. They usually speak at least conversational English and are no longer in ESL classes. Further details are described in our case scenario below.

Maria is a 31 year-old immigrant from Mexico City. She's been living in the United States for 6 years, 4 of which have been in Pittsburgh. She lives in Beechwood, PA, a suburb of Pittsburgh, with her husband, 8 year-old son and 2 year-old daughter. Only her daughter is a US citizen. They live on the second floor of an old house that has been divided into apartments. The apartment has a bedroom, a living room, and a kitchen. She, her husband and the baby sleep on a mattress on the floor of the bedroom. Her son sleeps on the couch in the living room. Maria works as a baker in a restaurant and her husband works in construction. Her English is fairly good: she studied the language while she still lived in Mexico; however her husband speaks very little English. Her son is completely fluent in English; he has been going to American schools since he was 5. On a typical workday Maria will get up at 7:00am and fix breakfast for her and her husband. After her husband goes to work, she will wake the kids. After breakfast she will drive her son to school and drop her daughter off at day care. By 9:00am she is at work. She works till 5:00pm making pastries. Her husband gets home from work first and picks up the baby from day care. Her son comes home from school on his own. After dinner the family usually watches TV and gets ready for bed.

After living in Pittsburgh for four years, Maria really likes the city. She says that it is so much cleaner and safer than Mexico City. She really likes the people and appreciates how Latinos are not judged so much in this area. She loves her neighborhood and loves the fact that her children can play safely in the yard without risks of kidnapping. Maria says that in the USA, she feels that she can make something of herself, even save a little money and send her kids to school, unlike in Mexico where she could only live paycheck to paycheck.

After living in the area for a while, Maria has started to make friends with one or two of the neighbors and even some of the parents at school. She also meets people at church. While she has a number of acquaintances in the

area she still does not have many friends to talk to on a regular basis. Instead she calls home to Mexico every day, sometimes more than once. She calls her mother every day. Her two little sisters live with her mother and so she talks to them as well. Once or twice a week, she calls her father. Her parents are divorced, and her father lives with her uncle. Every few days she calls her cousins in Chicago. They're much more established than she is. Recently they bought a new computer and so gave her their old laptop. Luckily, her neighbors have an open network, so she can get Internet access for free. Prior to receiving the laptop, she would go to the library once a week with her kids to check her email. She would use email to keep in touch with her cousins and nephew, as well as to get notification emails from the Pittsburgh Hispanic Center. On occasion she would even receive emails from her doctor.

Maria has a few things in her house that remind her of home. While she was not able to bring anything with her but her son when she moved here, her mother has since sent her some small things in the mail. She has a tortilla keeper and a decorative plate that she hangs on the wall. These remind her of her of Mexico. The food also reminds her of Mexico. She tries very hard to get food from the Mexican stores in the area in order to provide the same tasty home cooked meals that she enjoyed as a child. Her mother sometimes sends her things that she can't find in the US stores, such as vitamins and medicine. Maria gets migraines and takes medication for them. While she has medication from a doctor in the States, she doesn't use it unless her headache is very bad. Most of the time she uses medicine from Mexico because it is much cheaper.

She drives a rusty old red Toyota Corolla. She's always very careful to obey all traffic laws in fear of being pulled over. She has a license, but it expired a few months ago. In five years, she sees herself applying for citizenship. She expects that she will keep living in Pittsburgh; she really likes the city. In ten years she thinks she might even move her mother up so that she can take better care of her, but she does not know for sure.

#### *Established Immigrant*

The established immigrants are usually closer to the middle class. They tend to have steady jobs and often are either applying for or have acquired citizenship. They too usually live in the suburbs, often with their own houses. These people are usually active members of the community and very proud of their new country. They also tend to be moderately tech-savvy.

Silvia is a 33-year-old immigrant from Chile. She's been living in the United States for 13 years, all of which have been in the Pittsburgh area. She lives in the East End of Pittsburgh with her husband and two sons. She has just gotten her green card and her husband's application is still pending. Both of her sons, 8 and 10 are citizens, born in Pittsburgh. She and her husband own an old house that they have been fixing up for a year or so. The house has 3

bedrooms, 2 bathrooms, a kitchen, a dining room and a small office. They also have a washer and dryer in the basement. She works cleaning houses part-time and her husband works in construction. Both of them speak good English. On a typical day her and her husband wake up at 6:30am and she fixes breakfast. At 8:00 she wakes the kids up for school. After breakfast she walks them to the bus. Once the kids have gone to school Maria often walks to the store to buy food for dinner; she lives very close to the East End Food Co-Op. Once she gets home, she tidies up the house a bit and drives to work. From 11:00 to 2:30 she cleans a house in Shady Side. At 2:30 she comes home to meet her boys getting off the bus. Her husband gets home around 6 or 7 for dinner. After dinner she helps the boys with their homework and then the whole family watches TV together until bedtime.

Silvia loves Pittsburgh, she loves the people and she loves the four seasons (although she notes that she does not like shoveling her car out in the winter!). She's a big Steelers fan and has a Terrible Towel in her window. She also really likes to go to Frick Park with her kids. She says that this is a wonderful, safe, and clean place for her kids to grow up. She's hoping that one of them may want to go to the University of Pittsburgh when they get older. She's been saving up a little money where she can to help them with school.

At this point Silvia has made a lot of friends with other Latinos in the area. She has a number of friends from Mexico who come over on a regular basis. She loves to cook for them. She calls them her second family. She also keeps in close touch with her family back home in Chile. She has a 14-year old daughter who still lives there with her mother and father. Her daughter has visited Pittsburgh a couple times, but wants to stay in Chile with her friends. Silvia calls her parents and daughter every day. Sometimes she also talks to her daughter on Instant Messenger. Every week or so she also makes a point to call her best friends in Chile. Silvia goes to Chile once every year or two just to visit friends and family. In the meanwhile she uses email to contact most of her friends, both in Chile and in other parts of the United States. Recently one of her Mexican friends started using Facebook and has been nagging her to join. She still feels skeptical, but plans on giving it a shot.

All Silvia brought with her from Chile that reminds her of home are her clothes. She used to belong to a hippy commune, and the clothes remind her of good times and good friends. She also has some clothes that used to belong to her friends that were given to her as gifts, she treasures these the most. Since moving to the United States, her mother and father have also sent a few things back with her from Chile such as artwork and pottery. She has them on display in her home. The thing Silvia misses most about Chile however is the food. While she tries to recreate her mother's cooking, she never seems to quite get it right. She shops at Latino stores in Pittsburgh, but somehow it just isn't the same.

Silvia drives a minivan and her husband has an old pickup truck for work. She tries to walk when she can, but only for her health. In 5 years she sees herself possibly going to school for her associates degree. The boys will be older then and better able to take care of themselves. In 10 years she thinks that she might be working a new job and paying her son's way through college.

### **Preliminary Analysis**

The communication needs of the people we have contacted to date ranges based on which of these three demographics they are coming from. The *early immigrants* are in need of many social services and could really benefit from the availability of technologies such as the Internet to help them gain access and information about social services and groups in the area. Additionally, they may need other social services to help them build a social network and begin to integrate into the community.

The *suburban family immigrants* are better established, at this point they've figured out how to gain access to most of the services they need, but they are still struggling to be a part of the community. Access to the Internet and email could go along way toward keeping them connected to groups in the community and providing them with a means of supplementing their social network.

The *established immigrants* are doing quite well for themselves. These people are in no great need of any sort of supplementary technology or service. However, through the development of the right kinds of programs and social groups, they may be able to help support the *early* and *suburban family immigrants*.

### **REFLECTING ON THE MODEL AND PILOT WORK**

Our new data both confirms and adds more to our pilot research. In our pilot research we developed a model of the dynamic factors of acculturation. Our new data supports our model by providing further examples of immigrant lives that conform to our model. Our new research extends our understanding by illustrating that there are actually a number of sub-groups within our population. We were able to capture and define these subgroups though a series of vignettes.

### **DISCUSSION**

By studying divided Latino families we have explored a demographic not only divided by distance, but facing a cultural divide as well. We developed a model for understanding and developing for acculturation in divided families. We have recognized eight dynamic factors that work in concert to determine the degree of acculturation an immigrant achieves. These factors include product access, time in the United States, economic status, social place, personal place, sense of self, people (both at home and away), and their relationship to technology. To develop appropriate technologies we need to consider these factors in relationship to each other. Given the typical position of our demographic we advocate that creating cheap,

accessible, international technologies would assist though this transitional period, potentially reducing the duration of discomfort. There are two directions that the technology may need to take. First it must be able to connect divided families to their loved ones abroad. As a new growth area with little to no social network to fall back on, Pittsburgh Latinos would greatly benefit from technology scaffolding. It must account for the level of technologies on the receiving end, meaning that it must be compatible with the level of technology available abroad. Second, it must also help in connecting them to other people in their area so that they may begin to build a new network. While there are over 20,000 Latinos in the Pittsburgh area they are disconnected because of their new growth condition. Developing a technology to mediate this divide would also significantly aid in the acculturation process

These technologies would not only benefit the immigrants, but could potentially also benefit any audience that is divided by distance and still depends socially and emotionally on their prior social structures throughout their transition. This may include any type of immigrant, soldiers abroad, or simply a family moving across the United States.

## CONCLUSION

This work addresses the issue of families divided by distance by combining research from three fields to build a new point of view for technology products. We identified an overlap in the fields of acculturation, technology on the fringe, and the immigration of Latinos. We establish that Immigrant Latinos in a new growth area use technology products to maintain their social networks. Given their impoverished social networks they have a great need for technology products to maintain them. Technology products play a crucial role in mediating the acculturations process by keeping divided families connected and scaffolding the construction of new local networks. Key factors for acculturation in new growth areas include lack of a social network and lack of access or knowledge of the technologies to maintain them. We presented a dynamic model for designing technology for this audience to support their acculturation process. We then apply and support this model with further work. By combining our experiences with the model and interviews we are able to identify three major groups that our participants fall into. We describe these groups and presented a number of vignettes to characterize them. Together we have offered a strong preliminary view into the technology usage and social network s of Latino immigrants in a new growth area

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