"I didn't bring my mobile": changing technology use in a Mexican village

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Abstract
The cellphone has been a prevalent motif of recent research on technology and development. Yet, the cellphone is only one new technology amongst many that are influencing and affecting the life of new technology users in emerging regions. In this paper we outline our recent work in Mexico studying how some youth are supplementing their use of cellphones and moving onto internet communication methods such as instant messaging and websites such as YouTube and Wikipedia. We present early results from studying a Oaxacan village in the mountains of the Mixtec Baja. Despite the relative geographic and economic isolation of this village, technology is heavily used by the youth of the village, funded in part by migrant remittances from north of the border. While few homes have running water, some children have iPods and the internet cafe in the closest town is heavily used to access YouTube, Wikipedia, and MSN messenger. We document the ways in which the internet has come to be used to communicate both within the village and across Mexico. Even though there is no internet in the village, young users who spend time at the nearest town have found a way to incorporate internet cafes into their daily lives. Alongside cost, the internet fits into the communication patterns and daily routines in a way that cellphones do not. We show the various ways communication strategies have developed around an ecosystem of technology tools. Instead of the more common story of cellphones replacing the PC, we are finding that new users are finding ways to incorporate instant messenger into their communication practices in ways that replace or reduce their cellphone use. In conclusion we discuss the relevance of these results for the future lives of these new youth users.

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Introduction

As an OECD and NAFTA partner, Mexico is an intermediate economy, which if not saturated with new communication technologies, is at least heavily dependent upon them (Telecom CIDE 2005; Mariscal and Rivera 2004; Mariscal and Bonina 2006). Primary amongst these technologies is the ubiquitous cellphone—the most prominent symbol of the technologically modern, and a device that has greatly extended access to telecommunications. Yet despite its popularity and simplicity the cellphone is not the technological end of the road for transitioning regions. Indeed, as a number of studies have shown the internet has also grown in usage in low-income areas all around the world—usually through shared internet shacks, or shops, where those without access to a home PC can access the internet, often quite cheaply (Veeraraghavan et. al. 2007; Miller, 2000). On the whole, however, the effects of the internet and cellphones in combination have not been extensively documented in low-income regions. Existing research either documents only cellphone usage (Abraham 2006; Aker 2008; Aminuzzaman et. al 2003; Hahn 2008; Horst and Miller 2005; Molony 2008a, 2008b; Kaba et. al. 2008) or only internet usage (Baasanjav 2003; Burrell 2008; Rangaswamy) by itself.1

Many scholars have honed in on the phenomenon of migrants using ICTs for transnational communication. These studies overwhelming focus on adult users who make use of a wide range of technologies for economic motivations, regional contact with friends and family, or international communication (Burrell 2008; Donner 2005, 2006; Horst 2006; Muse-Orlinoff et. al 2008; O'neil 2003; Qiu et. al 2009; Zainudeen et. al. 2006; Vertovec 2000; Wilding 2006). Recent attention is also being paid to technology usage amongst internal migrants (Qiu et. al 2009).

Our research looks at communication practices through the eyes of the first users of new technologies in a migrant sending community--youth users who have expressed no plans to migrate and who have expressed ambivalence towards the culture of migration that has long been practiced in Mexican villages for the last 50 years. While much research has investigated youth as ICT users in Europe, Japan, Australia and USA (Ito et. al. 2005; Ling 2002, 2004) little work has been done on youth as consumers of new technologies in transitioning regions, in particular rural areas. Although there is a great deal of research being directed at ICT use in rural areas, it is largely motivated for economic development projects driven by private cellphone companies, non-governmental organizations (NGO), the World Bank or the United Nations (Bhavnani et. al. 2008; Goodman 2005; Seshagiri et. al. 2007; Sinha 2005).

Moreover, while much of the work on new users is being done in Africa and India, there is less work being done in Latin America and almost no work being done in Central America. A few researchers have begun to look at new and under-served technology users in Mexico, and the strategies migrants and their families use to maintain connection with each other within and outside of Mexico (Castro and Gonzales 2006, 2008; Muse-Orlinoff et. al. 2008; Smith 2003). Our work builds off of this existing research but specifically looks at the first technology adopters, who are youth. We gathered ethnographic data on a migrant-sending Mixtecan village on a population of youth who are have thus far opted out of migration. As such, our study is not developed from a framework of transnationalism nor migration. Even though we are working with a migrant-sending village, the population we are studying are not migrants, rather they are a sub-section of the youth population who were born in a migrant-sending village but have decided to forgo migration, unlike other youth in their cohort who have already left or plan to leave.

This paper presents preliminary findings from recent ethnographic work looking at how in many ways the internet works to supplement and at times replace the use of cellphones for youth in a rural Mixtecan village in Oaxaca, Mexico. In particular, the youth of the village, have become regular users of the internet with moving from the cellphone to instant messenger as a supplementary and at times a dominant form of communication. The cellphone is not only more expensive, but less practical because of the need to find good enough signal strength while in the village or in transit, the need to keep it charged, and the need to maintain enough credit. Instead of the more common story of cellphones replacing the computers (Ito et. al. 2005; Nylander, 2009), we are finding that new rural users are finding ways to incorporate computer-

mediated IM'ing into their communication practices.

Methods

The broad goals of our project in Bicuhuini are to experiment with new ways of finding out about technology use among new users in a new usage context and developing more appropriate technology for villages like Bicuhuini. Our original first visit to the village came as part of a UC MEXUS research project at the Center for Immigration Studies at UC San Diego that collected data examining the innovative ways internationally dispersed families from Oaxaca, in southern Mexico, worked around barriers to communication.[2] This work documented how rural Mexican families use the single landline in the village, international and local text messages and internet cafes to communicate with family members working over the border in the United States. Building on this work, our goals in our current UC MEXUS funded project are to collaborate with the youth of Bicuhuini to design and build prototypes of ecologically grounded, appropriate technology for communication across the border between the sending and receiving migrant communities. As part of this we planned fieldwork in Oaxaca over one year, to gain a in depth and close understanding for the nature of the village and its relationship with technology. In this paper we focus on our ethnographic results from both field visits.

We have visited Bicuhuini twice to conduct fieldwork, spending around one month in the village and in the surrounding towns. During each visit, we worked with the village authorities to be granted permission to conduct the fieldwork. In each visit we have interviewed a range of different members of the village, focusing on understanding the life of the youth of Bicuhuini - 14 to 27 year olds, most of whom are either attending a junior school in a neighboring town (and so travel back and forth each day) or whom are staying home because their family can no longer afford the monthly school fees (which comes to about $20). Supplementing this fieldwork we have also interviewed individuals from Bicuhuini who are based in the US, as well as keeping in regular contact with youth in the village from the US over MSN instant messenger. With the changing administration of the village from year to year our fieldwork visits varied considerably in the methods used. Moreover, in the time we have been working with the village the economic climate, but also the immigration regime in the US has changed considerably with policies making it much harder for immigrants to enter.

During our first visit to Bicuhuini in 2008, we conducted two phases of fieldwork. The first phase took place in Bicuhuini, with the goal to understand the social context of the village and gather general demographic data. Over the course of eights days of fieldwork with the help of research assistants from UCSD, we engaged in a mixed-method approach. We implemented 98 individual level ethno-surveys (159 questions) to residents between the ages of 15 and 65. The one to two hour survey asked straightforward fact-producing questions about wages, migration history and education. At the same time, we engaged in 10 informal interviews with youth, 10 interviews with adults and 40 hours of participant observation with youth. During the second phase, we contacted the families of the residents of Bicuhuini in Southern California. We conducted interviews (N-8) and participant observations (30 hours) with the families in the US. We engaged in instant messaging contact with three chief male informants (16 to 19 years old) from the village through MSN Hotmail Instant Messenger (which will from now on be referred to as IM). 50 hours of conversations were logged over a period of 11 months for over 30 chat sessions.

In the second visit in 2009, we focused on interviews with members of the village, alongside participant observation in the town's public spaces. We conducted two group interviews with two people in each group that each lasted a half hour. The audio for these interview were recorded, transcribed and translated. We recorded five short videos of people showing us their cellphones and 10 informal interviews with youth cellphone owners and non-owners between the ages of 14 and 22 years old. Out of the 10 informal interviews, three were females and one was male. Two of the females and one of the males were non-cellphone owners. One hour was recorded for seven of the 10 interviews, which were transcribed and translated. Over 40 hours of participant observation were conducted in the village. 10 hours of participant observation was spent traveling with youth to the nearest internet cafe 30 minutes away.

Our goal the second trip was to conduct two focus groups with one group of male youth and another group of female youth with five to six participants in each group. Since there are only anywhere from 18-25 youth between the ages of 14 and 27, we thought that this would be a realistic goal. However, two changes in the

village's social space that took place between our two field visits affected our plans. Upon our arrival on our second visit, the population of males between the ages of 15 and 22 had at least doubled. We noticed them the first night when they were hanging out at the basketball courts. After speaking to them, we found out that these young males migrants were victims of the recent wave of targeted deportations of Mexicans by the USA's Immigration and Natural Services (INS) that were a part of measures from the Us Department Homeland Security. While this new group's presence presented an interesting story, our research aim was to build on our previous' years fieldwork and speak to local youth who had not migrated and were not planning to migrate, for these were the youth who were adopting information communication technologies (ICTs). With the presence of this new group of young males, we noticed that the local youth of Bicuhuini were no longer hanging outside in the street. Several informants told us that the newly deported young males intimidated the local youth, therefore most of them remained inside their houses. This made it difficult to coordinate focus groups.

The *agencia (town hall)*, along with the church and *caseta telefonica* (privately operated business for making and receiving telephone calls).[3] are all located on the main road in Bicuhuini. These three areas are a few hundred feet within another, with the caseta directly across the agencia. We also noticed that the doors of the *agencia* were no longer open throughout the day, agencia members did not spend their entire day walking in and out of the building, and youth were no longer playing in outside the agencia. During the first field visit, the agencia was always open and the ruling body of men were always outside on the bench. Their kids played in from of the agencia, which then attracted more kids and with the kids came their older brothers. It was relatively easy to observe interaction with technology in this visible and accessible social space. By the time of our second trip, a new ruling body was in charge of the agencia and appeared to administer the agencia with a different set of rules. When we inquired about this with last year's agencia members we were told that the new mayor did not keep the doors open to the agencia as often as he should. For us, this meant that it was more difficult to observe technology usage in the open space. Luckily we had developed relationships with a few families over the past year and were invited to spend time in several homes. In this way, we were able to observe usage in a setting that we did not have access to in the previous trip.

The Village

As one of the most southern Mexican states, Oaxaca (one of 31 states) is known for its many geographically isolated villages (Fig. 1). Buried inside the meeting point of two mountain ranges, La Sierra del Sur y La Sierra Madre de Oaxaca (often referred to as the Mixteco Nudo), is Bicuhuini, population 500-800 (population varies due to migration). Like many other Oaxacan villages, the people of Bicuhuini are from an indigenous background, a geographically landlocked place, a difficult region to grow enough food beyond a subsistence lifestyle due to the un-irrigable land, and a region that has little employment opportunity. Despite these unique Oaxacan features, nevertheless the migrants of Bicuhuini for the most part resemble other Mexican migrants in that they come to the US to work and send remittances, which is a portion of their monthly income, back to their family in Mexico. Remittances from Mexican migrants is the second largest part of the Mexican economy and keep many villages like Bicuhuini financially afloat (Smith 2005; Cornelius 2007). In Bicuhuini, over 71% of the remittance money alone is spent on subsistence, such as food and
water.[4]

Fig. 1 Map of the transportation route between Oaxaca City and Bicuhuini

The state of Oaxaca contains the highest number of speakers of indigenous languages and is the historic home of the Zapotec and Mixtec. The people of Bicuhuini are Mixtecan, the second largest indigenous group in Mexico. For most adults, Mixtec is their first language and Spanish is their second language. Most of the elderly only speak Mixtec, as spoken Spanish is a relatively new language in the region. Spanish was only adopted after people started migrating to other parts of Mexico 40-50 years ago. Even though Mixteco is taught in the schools starting at the equivalent of third grade, most youth can only understand and not speak Mixteco. Despite the decline in the spoken language of Mixtec among the youth, there is a strong sense that the youth and adults overwhelmingly identify with the village of Bicuhuini, not with the ethnic identify of Mixteco or the regional identity of Oaxaqueno or even the national identity of Mexican. This is consistent with the findings that indigenous groups in Oaxaca strongly identify with their birth village, rather than their ethnic group, state or nation (Kearney and Nagaensat 1995; Stephen 1996).5

The persisting strength of village identity among indigenous Oaxacan groups is under-girded by a system of local governance that is solely unique to indigenous Oaxacan villages. The process of *Usos y Costumbres* (Uses and Customs) is formally recognized by the federal government as a local ruling system to preserve a certain degree of political autonomy for indigenous villages. Although the rules of the system vary among villages, the common result is that it fosters a loyalty to one's village (Stephen 1996).

The rules in Bicuhuini require that every male serve a one-year term in their elected position. The service is equivalent to working a full-time job even though it pays very little. But with a large population of eligible males living in the US, this would seem to be an impossible system to keep up. Despite the distance and the economic losses of giving up one year's worth of US earnings to serve their term, every year a group of elected migrant males return to Bicuhuini to perform their duties. These males are able to return because most of them have documentation through the Immigration and Reform Act (IRCA) of 1986 (Garcia 2002).

Citizens of Bicuhuini do not turn down a position when elected because they would no longer be a citizen of Bicuhuini. They would no longer have the rights to be buried in the village's cemetery and lose the right to inherit or own land in Bicuhuini. As all three of these outcomes are serious repercussions that would essentially prevent anyone from returning and retiring in Bicuhuini. The system of Usos y Costumbres is thus one of the strongest social glues of daily life in Bicuhuini. It ensures that the older male migrants return every few years to reconnect with their families. Understanding this system is important because it provides part of the explanation for why villages like Bicuhuini continue to thrive despite having a third population working in the US. It also later provides insights into how youth use the internet and the future of other villages like Bicuhuini with youth who are online.

Migration

Bicuhuini is considered a relatively new recent migration sending community as the village has just started to send immigrants to the United States 40 years ago. With migration comes changes in the village demographics. In Bicuhuini, there are three main groups: women, who stay in the village to look after the family, youth who

have not yet migrated, and older men who have returned from the US or who are too old to attempt the border crossing. Two groups that are citizens of the village but continue to live and work abroad are: father and young males between the ages of 15 and 27. The process of migration is different for these two generations. The older migrants, the fathers, entered into the US without papers but many have since obtained legal documentation through the 1986 IRCA Act. Young males tend to migrate without any legal US documentation. Without papers, migrants must cross the deserts in Arizona, California or Texas with the aid of a professional border crosser, known as a "coyote." The trip from Oaxaca to the United States is long and dangerous, lasting around a week or two. Once in the US, migrants with papers can afford to return to Mexico and re-enter the US legally every few years. Migrants without documentation either stay in the US or return to Bicuhuini eventually, but without papers it is very rare for them to voluntarily return to Bicuhuini and to make a second crossing back to the US.

Bicuhuini families with members in the US sending remittances are overwhelmingly more economically well off than families who do not have this source of income. Without remittances, it is difficult to live beyond a subsistence lifestyle. Families with remittances can afford to build concrete houses, continue to send their children through high school and even university level, buy equipment to work their land, and create small local businesses such as a village store.

With most males are working in the United States, the gender ration in Bicuhuini is weighted towards women. The gender index in Bicuhuini provides that for every 100 females, there are 85 males.6 In each household, the women manage daily activities and finances. They make one to two trips to the nearest town to buy vegetables. A typical household in Bicuhuini is filled with elderly grandparents, the mother, and the children.

During our first visit, the only young males in the village were ones who had not yet migrated to the US. Few young males were in the village, as most of them had left to work in the US. According to the 2005 Mexican Census taken in Bicuhuini, there were 60 youth between the ages of 10-14 years old. The youth population dropped by two-thirds for the 25-29 age group, with only 13 youth left in this age range. Another reason for the low number of young males in Bicuhuini could be attributed to the migration climate during that time, where increased border patrol has prevented many undocumented migrants from going back into Mexico because of the fear that they would not be able to re-enter. Essentially, there has been a "bottleneck" in the US where migrants have been too scared to return to Mexico (Cornelius 2007).

Technology in Bicuhuini

Being a geographically isolated, Bicuhuini, deals with similar issues that other isolated Oaxacan village's experience. Access to quality education, availability of timely news reports and strong local economy are all areas of friction.7 Despite the strong emphasis in education among families, its landlockedness prevents the youth from having access to the same types of schools that urban youth may have. Many families are unable to send their children past the equivalent of junior high. Bicuhuini is 15 minutes away from San Miguel Tlacotepec, a town with a population of 2,000 people, and 30-40 minute away from Juxtlahuaca, a town with 20,000 people. There is one landline in the village at the local caseta that was installed 15 years ago. The village receives television signal for one channel that shows nightly news, some telenovelas and educational programming. However, not all families can afford to purchase a TV and pay for the electricity required to power the TV. Bicuhuini is also economically landlocked as there is little economic opportunity in the region. With this being the case, families that can afford to send their children to school past junior high and afford other luxuries such as the television, can only do so because there is a family member in the US who is sending remittances. Cellphone signal in Bicuhuini is very weak and in most places unavailable. Even though the maps (Fig 2.) show no signal coverage in Bicuhuini, there is some weak signal.

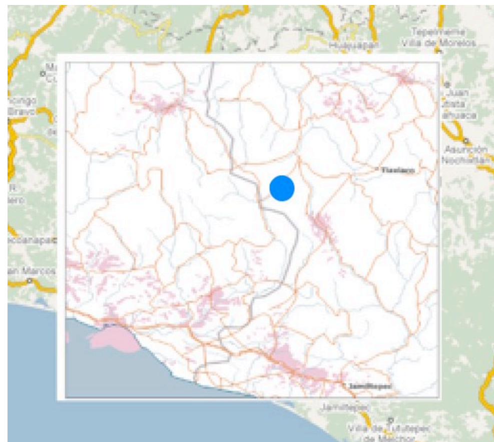

Figure 2: Map of cellphone coverage in Bicuhuini (blue dot) according to network provider maps. Coverage areas are in light red.

Results: First visit

The changes in the village - and particularly in technology use - were stark between our two fieldwork visits, so we will present out results in two sections. From our first visit we start by recounting our experiences with one inhabitant of Bicuhuini, Gabino. His story recounts a common experience for a sub-section of male youth in his age group. We will first report on his communication practices and then explain how his usage patterns were also observed among other male youth. Then we will provide an explanation for what we observed. In the second section, we recount our observations on our second visit to Bicuhuini. We will refer back again to Gabino's story and then extend our observations to other male youth of the same age group. Lastly, we will explain our observations around internet usage for both field visits and discuss how we believe IM usage is at times supplementing or replacing the cellphone for this specific group of users, male youth between the ages of 14 and 27 years old.

Gabino is a 16-year-old teenage boy who is in high school. He is the oldest male and the second oldest child of five children. His father, Miguel, lives and works in the US, sending monthly remittances back to the family. Miguel has US documentation, therefore is able to return to Bicuhuini every 3 to 4 years. His family lives in a two-story concrete house that is directly across from the agencia on the main road. On the front side of the first story of his house is their store and caseta, a public place where people can make or receive telephone calls. His family owns the one analog telephone line in Bicuhuini, called the caseta. There is only one landline because due to a policy of Telmex, the privatized phone monopoly in Mexico, where rural villages with a population of fewer than 1000 people only have one landline (Mariscal 2002).

Since Gabino's family owns the only caseta in Bicuhuini, which also serves as a supply store, they are one of the most financially well off families in Bicuhuini. Their financial stability means that Gabino can continue with his high school education at the closest high school in Juxtlahuaca, a town 30 minutes away from Bicuhuini. This town has the several internet cafes, several high schools, markets and regional administrative government buildings. During the weekdays Gabino lives with his uncle in Juxlahuaca and during the weekend he returns home to Bicuhuini to work at the caseta. Gabino goes online at the local internet cafes after school everyday

When we first met Gabino, he was constantly playing with his cellphone in his hand. During this first field visit, we never saw the cellphone leave Gabino's hand except for the night of the village dance. However, we never witnessed Gabino use his cellphone in Bicuhuini. He reported that he only used it when he left the village to stay in touch with mother back in Bicuhuini. He also said that he used it to send text message back and forth with cousins. After we left the village the first time, we continued to stay in touch with Gabino via MSN messenger chat. When we asked what he doing online every time, he usually said that he was looking up information for his homework or for school related information. When we asked whether his teachers required students to use the internet to finish their homework, he laughed and said that it wasn't his school that required him to go online, but

rather he was curious to learn other things.

Our observations of Gabino's technology usage was consistent with the young males we spoke to in Bicuhuini. Although his family is in an exceptional economic position of being the caseta owners, Gabino himself shares similar traits with other male youth in Bicuhuini such as being male, the first cellphone user in their family, the primary person in charge of the cellphone in the family, and the first in the family to attend high school. Like Gabino, several males in his same age range have a father and/or older brother working in the US. The remittances that the migrants send back provide enough financial support for the family so that youth who would have migrated no longer have to migrate. The generation of youth from these migrant-successful families are able to remain in Bicuhuini, finish high school, and even attend college. All the youth we spoke to expressed their desire to not only stay in Mexico, but to stay connected to Bicuhuini. Surely these youth have seen their fathers and brothers (who have documentation) return and leave Bicuhuini every few years to serve the village in the system of Usos y Costumbres. It is very likely that witnessing this contributes to their dedication to the village, but also to the realities of migration – that one has to leave every time they return. In conversations with these youth, we noted their ambivalence towards the migration process with constant statements about their fear of leaving and their desire to make a living in Mexico. Trough the technology usage, we saw them using the cellphone is ways that reinforced their social ties within Mexico, not out of Mexico to the US. With their hopes to see their futures in Mexico, the youth appear to be investing heavily in ICTs that further cement their social ties.

Cellphone use

We found that early adopters of cellphones and the internet are primarily youth who travel to other cities. In particular for cellphones, users were always youth who attended school in another town and they were all male. We never witnessed a female youth with a cellphone. Each family owned one cellphone and the son was in charge of the phone. Like Gabino, when they were in public space, they were almost always holding the cellphone in their hand, turning it around and playing games, and looking up addresses. We never saw anyone making a phone call while in Bicuhuini. Just like Gabino's report, they told us that they only used their cellphones when they were away in another town and they used it to place a call back to their home. Many reported occasionally placing 1-2 text messages per week to a cousin in Mexico or a friend in a nearby town. However, very few friends owned a cellphone therefore it was not possible to text all their friends or cousins.

Many of them reported to go online a few times week while they were in Juxtlahuaca or a town big enough with several internet cafes. Even though their schools did not require for then to use the internet, they liked to go online to look at music videos or news. We stayed in touch with several of the youth after we left Bicuhuini, and we spoke to them via MSN chat several times a week. Every time we shared information about each other's families, world news, and emerging music artists on YouTube. Most of them had a hotmail address that reflected the name of the Bicuhuini. For example, Gabino's email address had his name followed by Bicuhuini. If they did not have an email address reflecting their affinity with Bicuhuini, their status message in their hotmail chat would either have a phrase of a Mixtecan child's song or something about Bicuhuini.

Whereas most of the recent literature on ICTs has shown that early adopters tend to be business owners (Donner 2007; Ito 2007), our first fieldwork trip revealed that in Bicuhuini it was mobile youth were the first adopters. There are several reasons behind this arrangement. First, business opportunities are limited in rural Mexico where most economic activity is based on subsistence and remittances. As such, the possibility of being a 'mobile professional' in Bicuhuini are limited. While youth thus take the place of the first adopters, the youth are not earning money and must rely upon remittances from the US. These remittances enable some youth to attend a better, but more costly school outside of Bicuhuini, to own a cellphone, or to surf online. A second explanation for youth as the first adopters is that adults over 40 years old are not fully literate. Our first survey in Bicuhuini 2008 showed that it is only recently that youth have been able to continue school beyond third grade. Those older than 40 years old are more than likely to be illiterate. Cellphone usage does not require literacy *per se*, but it does require some level of comfort with interacting with digital objects that display words.

It is not surprising that the first users of cellphones and internet cafes were males. Bicuhuini reflects a more traditional gender breakdown, where females tend to the house duties and males have more freedom and time to play outside. Young girls begin to take care of their brothers at a young age. As they get older, the gender roles more or less stay the same. For example, in the Usos y Costumbres, only males can vote and be elected to a position. While there are groups formed for women, they cannot vote or hold a position in the agencia.

While we were doing participant observation in the village social space in front of the agencia, we never witnessed females playing outside with us except for Gabino's sister and even she seemed to have to stay closer to home than him. Even though both of them lived in Juxtlahuaca during the weekdays, it was Gabino who was in charge of the phone.

A surprising finding was the extent of symbolic usage of cellphones that we witnessed in Bicuhuini. A possible explanation for all the public display of holding and playing with the cellphones in their hand is that like other studies on youth cellphones users in countries that were early to adopt cellphones, such as in Norway, cellphones have a symbolic role in youth interaction (Ling 2004). Youth all around the world want to be associated with new things and for the youth of Bicuhuini, these cellphones are items of novelty to display as status symbols objects. Although Bicuhuini is geographically isolated, the cultural concept of the cellphone as a modern object is widely marketed in the nearby town of Juxtlahuaca on television commercials, street advertisements and cellphone stores (Kavoori and Chada 2006).8 The youth who were in the position to show-off a cellphone all came from economically well-off families who had fathers sending remittances. In this way, the cellphone functioned much like a proxy status symbol for their remittance sending fathers.

Moreover, even if one could not afford to use a cellphone's communication functions due to weak signal, there is related functionality that can make the telephone (perhaps only initially) something that can cause amusement. This includes games, clocks and timers, but also activities such as adding (and deleting) names from the address book. As Taylor discusses, who is in your address book can be a topic of some amusement or controversy (Taylor and Harper 2003).

In addition to the cultural explanation, we also believe that the quality of the telecommunication infrastructure, the number of friends who have cellphones in their network, the economics of maintaining enough credit and the mother's role for purchasing the cellphone all play a large role in their non-use of cellphones. When we were there the first time, the cellphone signals were so unreliable and weak that it was difficult to sustain a voice call. There were only a few places in the village that could hold a call, but even then those places were unpredictable according to the youth. Yet, another aspect is that since these were new cellphone users and all of them reported that only some of their friends had a cellphone, it is likely that they just did not have anyone credit to call or text. Many of the youth also explained that it was expensive to make a phone call and that they wanted to maintain enough credit in their account. Since none of the youth were working, they were not responsible for paying for the credit or even buying the phone. All of them said that their mothers bought the cellphone for them and instructed then to use only when they needed to call back home to Bicuhuini. We sensed that while this was the original purpose of the mothers' decisions to use a part of the remittance money to invest in a phone for contact with their sons when they were away from home, the youth were trying to find ways to use it to maintain contact with their friends. They all reported using text messaging to contact their friends. While it did not cost money to receive, it did cost to send. Therefore, it was difficult to maintain a more chat-form of text messaging that we have seen among youth texters in the West (Ling 2004).

The Caseta

We also found out that none of the youth or their families used their cellphones to maintain any form of contact with their fathers in the US. Even though all of them said that they fathers had cellphones, most of the time they did not have their cellphone number. When we visited their fathers in the San Diego area after we left Bicuhuini, we found out that indeed most of the fathers had cellphones but they also said that they did not use it to call Bicuhuini. Both sides cited the high costs as a factor. Plus, the signal in Bicuhuini was not good enough to maintain a cellular call. Rather, both sides were relying on the local caseta in Bicuhuini. We found out that some families who were more economically well off were able to install a stationary satellite phone in their house. Much like a cellphone, they had to maintain credit on the phone by buying recharge cards.

Like previous studies on ICTs usage in unevenly developed regions, we found that ICTs were used to maintain strong ties (Goodman 2005). Previous transnational literature on migrant sending and receiving communities have assumed that once both sides have cellphones, cross-border communication would increase as a result of cellphones. However, we found that the cellphone was being used to reinforce social networks within Mexico, not outside of Mexico. Cellphones did not change the way families communicated with each other across the border. The US side was still relying on discount telephone cards on landlines, and the Mexico side was still relying on the local caseta (and for some the stationary satellite home). Migrants in the US and their families in

Bicuhuini were using the caseta just as frequently despite the adoption of cellphones.

Results: Second Visit
We returned to Bicuhuini exactly one year later to follow up on our observations from the first 2008 visit. Our plans were to follow up with the same youth and in addition speak to new youth users about their communication patterns. Since we found that it easy to talk to youth in 2008 when they were always hanging out in front of the agencia we assumed that we would encounter the same situation. However, we encountered a new social space on your second visit. Youth were no longer hanging out in front of the agencia during the daytime or when they returned from school. We saw youth getting dropped off and walking immediately to their houses and remaining there for the rest of the night. Essentially, our easy access to observing youth and their interaction had disappeared. We had to change our strategy and work on getting inside to people's homes. We will now return to the story of Gabino and explain the differences in cellphone usage from the previous year.

Gabino clearly exhibited a different relationship with his cellphone compared to our first visit. This time we never saw Gabino with his cellphone in his hand. This was completely different from what we observed during the 2008 fieldwork trip, where Gabino always had his cellphone in his hand. Even when he was working inside the caseta in 2008, he always had his phone on the counter recording the length of each phone call and charge the person accordingly. When we saw him working at the caseta during my second visit, I never saw him with his cellphone. When he was working the caseta counter, he used the clock behind him to keep the time for incoming caseta phone calls. When we traveled together for the one-hour trip to Juxtlahuaca, both times he did not carry his cellphone on him. On asking about this change Gabino explained that he doesn't carry his cellphone around that much anymore because he doesn't need it. When we inquired further, he just shrugged his shoulders and said that he just did not bring it.

After one week together, we learned a few reasons why Gabino left his cellphone at home. When we texted him to arrange our travels to Juxtlahuaca, he never replied. He explained that "Sabía que ibamos a vernos en la tarde" - "I knew that we were going to see each other in the afternoon." He later revealed that he did not even receive the message, because his phone wasn't charged and that he did not even have enough credit to text back, which is said happens quite often. Gabino said that it was normal for the sender to not receive a response and often this was because the SMS receiver had no credit. Moreover, with the problems of inconsistent cellphone signal, it is possible that a sender's message could take a few hours to be sent. The sender is never absolutely sure a message is received unless the receiver texts back a reply to the message. This form of SMSing, as reported by Gabino and others, is an "un-instantaneous" form of texting as opposed to the instantaneous nature of text messages in areas with consistent cellphone signal.

Gabino explained that he knew that I would already be in Bicuhuini in the morning, therefore we would've already been in touch before leaving for the internet cafe in the afternoon. Not only did he not have credit to return my message, but also he felt no need to reply. In contrast to our first visit, in these discussions Gabino no longer thought it was necessary to return every text message on his cellphone.

Changes in cellphone use
We noticed a similar change among all the youth who were cellphone users last year. This year, none of them carried it around in their hands or inside their pockets. It was as if all the fascination with the cellphone last year had disappeared. When we spoke to the youth, all of them said that the signal was still too unpredictable in Bicuhuini. When asked, each youth had a different response for the best locations for maintaining a cellphone call in Bicuhuini. Some said that there were only three places in the entire village that could hold a signal. Others said that the signal was better during the night than the day. Others said that the signal comes and goes so they constantly keep an eye on their cellphone to catch a signal. Even though all of them said that the signal has improved from the year before, they all seemed to no longer treat the cellphone as novel piece of technology. Like Gabino, most of them said that text messages were not reliable and that they did not always have enough money in their account to reply.

In addition to noticing that youth no longer carried their cellphones with them everywhere, we also noticed that the youth displayed a much more nuanced understanding of periods when their cellphones were most useful. For example, during our first visit, Juan, then 14 years old, was always obsessively gaming and playing with his phone. One year later he did not even carry it around anymore. He had dropped his first phone and could no

longer see the screen. He then bought his current phone, a used Nokia hat was a bit slow but nevertheless could send messages.

We found out that Juan was no longer a student in Tlacotepec. The US immigration authorities had just deported his father to Bicuhuini after 5 years of working in the US without papers. Without Faustino working in the US, his family lost their entire income overnight. They could no longer afford spending $20 (200 pesos) a week for Juan's high school expenses and they needed to save the money for his younger brother's school fees. Now that Juan was no longer commuting to school 15 minutes away, he was not seeing his friends face-to-face on a regular basis. He stayed home and helped his mother around the house. He used to call his mom when he went to school in Tlacotepec, but now he primarily uses his phone to stay in touch school friends who no longer can see.

> T: Do you have friends?
> J: Yes
> T: Where do they live?
> J: Tlacotepec
> T: Oh in Tlacotepec and how do you see your friends?
> J: I send them messages
> T: Only messages? You don't drive there?
> J: No
> T: Oh you don't take a taxi there?
> J: No jajaja

Juan's story elucidates how he manages to stay in touch with his friends in a town that is only 15 minutes away. Now that he cannot see his friends anymore because he's not longer in school and Juan's daily activities no longer involve commuting 15 minutes away to Bicuhuini. To deal with this social landlockedness, Juan is able to text his friends and maintain these ties that he had created over the last two years of attending school in Tlacotepec.

However, since his father is no longer working in the US when we spoke to Juan's mother, we found out that his family is pressuring him to migrate to the US. Since Juan was born in the US he is under pressure to make use of his US citizenship by leaving his family and replacing his father's remittances form the US. When we spoke to Juan, he made it clear that he did not want to go the US to work. He told us that all his friends and family where in Mexico. But with a US passport and citizenship and his father no longer in the US, Juan will most likely have to migrate soon. In the meantime, to hold off the migration, Juan told us that he is looking for a job in Mexico. When we asked how potential employers could get a hold of him, he told us that he gives out the phone number to the house - their satellite phone. When we asked why he did not give his mobile number, he said that the signal was not reliable enough and he did not always have enough credit. Juan thus uses his cellphone as a medium to maintain friendship ties while the caseta is used as for creating economic opportunities. But with little economic opportunities, Juan may have to give up his resistance to migrating.

For Juan, it is the fixed communication methods that are still the most reliable and affordable communication tool. In this way Juan balances using the cellphone amongst other communication methods, it is no longer the central technological device that he uses. This was a common change amongst the youth that we interviewed.

A third youth who we interviewed was Diego - he articulated a nuanced use scenario for the cellphone. Diego is 18 years old and is a member of a traveling band. As the only band member living in Bicuhuini, Diego is quite isolated from his other band members who live in Juxtlahuaca. For him Bicuhuini is a place for rest in between performances and for family. Diego sees his cellphone for work related reasons and for making meeting arrangements with friends when he is staying in Bicuhuini. He explains that despite having his father's truck that he could use to drive to see his friends, having a cellphone allows plans to be made more quickly when he is Bicuhuini. But he says that for calls to family, he primarily uses the caseta because it is less expensive. Diego is already a very mobile youth with his entire band traveling to various cities in Oaxaca. What is interesting is that when he returns to Bicuhuini, he sees it as a place of rest and as a place that is disconnected from the rest of the Mexico, where his work takes place. He manages this disconnection through the caseta for calls to his family and the cellphone for text message to his friends and for business.

Instant messenger
In between the first and second visit, we were able to stay in touch with several of the youth over MSN messenger. This allowed us to extend our fieldwork and maintain weekly contact with at least 3 of the 10 youth we had focused on. Every time we chatted with the youth, we asked them what they were doing and where they had just come from. Most of them got online after their classes and they used the internet primarily to go to Spanish Wikipedia, check the news, online chat with other friends, and look at YouTube music videos. Instant messenger was heavily used by many of the youth to stay in contact with cousins around Mexico and friends in Bicuhuini or Juxtlahuaca. They were not using IM to stay in touch with family or friends in the US since their fathers in the US did not own a computer. Accordingly they were not using the internet to communicate internationally, rather they reported going online to do research for homework or to read about things that they were interested in, or watch music videos on YouTube. Their time online would vary from 15 minutes to one hour once or twice a week, usually after school before traveling back to Bicuhuini.

When we returned this year in 2008, we wanted to find out more about their IM'ing activity and Internet use. We traveled a number of times to the internet cafe with youth from the village. One of the key things that we found out was that the youth relied mainly on IM'ing to maintain contact with their friends for what we would consider to be informal ‘chatting’. They reported that when they see someone online, they initiate chat with all of their contacts and they can have back and forth conversations that are time-based. The youth who spent the most time in Juxtlahuaca were the more frequent IM users, in part because they spent most time in a town with internet access. This included students who attended high school in Juxtlahuaca and students who commute between Bicuhuini and other towns and use Juxtlahuaca is a stop point on their commute.

Why has IM become increasingly relied on through the last year? As noted earlier, when we first went to Bicuhuini in 2008 and spoke to the first cellphone adopters of Bicuhuini. Many of them had just bought their cellphones no more than 6 months ago. The cellphone moved from being a tool of novelty to a more focused tool to be used for certain sorts of communication. As the youth readjusted their expectations for their cellphones, new expectations were put into place for IM'ing as something to be used in addition to the cellphone. Upon further observations, we began to understand why Gabino did not "need" to bring his cellphone on him to maintain contact. We understood this better after we took two trips to Juxtlahuaca together with Gabino to use the internet cafe.

During our first trip together to Juxtlahuaca, we had to wait for a taxi on the highway for 45 minutes. During this time of waiting, we suggested that to call a taxi after 20 minutes of standing on the freeway. He said that calling wasn't an option and that the best thing to do was to just wait on the freeway. While we were waiting we asked if he had his cellphone on him, he told us that it wasn't charged so he did not bring it with him. When we arrived in Juxtlahuaca, Gabino kept running into people that he knew every few minutes. We decided to go to the food market and buy some etole de pina (beverage made of corn) and sit in the park. While we were buying the etole, Gabino saw three of his friends. While we were in the park, another group of friends walked by. When we arrived at the internet cafe, he saw some of his friends online in the cafe. After we logged into his MSN Messenger account, however, we did not see anybody online and he explained again that this was an odd hour, that this was dinner time and vacation time. Usually he sees at least four to five of his 52 friends online and he chats with all of them. He also said that he talked to his cousins who are in college a lot online and that this was the only way they communicate when they are away from Bicuhuini in college.

As we were talking at the cafe, one of his friends from Juxtlahuaca who has just moved to the US came online and they started talking. Gabino turned on his camera even though she did not' have one. They chatted about the weather, her new home in the US and various friends they had in common. After an hour, no one else popped up online. We paid for your time and left the cafe. When we talked out onto the street, Gabino saw another group of friends that he knew. When we met up with other youth from Bicuhuini and went to dinner, Gabino kept seeing friends enter in and out of the restaurant.

After two trips with Gabino to the internet cafe, we realised that IM seemed to be used for non-urgent chat conversation with friends, while the traditional phone lines were reliable for getting in touch with his family. IM complemented the face-to-face interactions that he experienced in school. It actually seemed highly likely for Gabino to run into friends that he knew even during a vacation period. During school, these face-to-face

interactions takes place during and after school and the IM'ing reinforced these face--to-face conversations. Other than cousins who lived in other parts of Mexico and his one friend who have moved from Juxtlahuaca to the US, practically all 52 of Gabino's contacts were in Bicuhuini.

In contrast to perhaps the more common use of cellphones in area with good coverage, the cellphone is not reliable as a method for ongoing conversations. Rather IM, like face-to-face communication, appears to be more reliable than a cellphone with spotty signal coverage. For example, IM is the only way he communicates with his cousins when they are away attending college in another town or state. The cellphone would both be too expensive, and difficult to use because of the poor signal. This means that these strong family ties with cousins of the same age who are online are being reinforced through IM, not through the cellphone or caseta.

Two other youth we interviewed, Fedro and Orlando, had made similar choices in their use of cellphones and IM. Orlando reserves his cellphone for work purposes, he uses the caseta to call his family and makes use of IM as a way to have conversations with friends, As he put it: “only that my cousin and I utilize the internet every Sunday when he gets online...well, I Only use it [IM chat] to have conversations with other people” Our dialogue with Orlando reveals that IM is used more frequently for chat-like conversations. Whereas in many places cellphones appear to be the key 'chatting' technology, in Bicuhuini, IM'ing at the internet cafe is the tool most likely for time-based chatting.

This is not to say that cellphones are not used at all; just that they are used in a different way. Orlando told us the story of an uncle who was looking for his family in Bicuhuini just one year ago:

> *He informed himself about his family here. He kept asking around and he found us here in the community. And through the media: radio and public announcements [..] he came here a year ago and we met him and he met all his family here [...] well he left his number to call.*

Indeed, letters seem to have fallen out of use amongst family members - "well now we have all that of cell phones and all that so that is all one needs". We might add to that the use of instant messenger.

This complex combination of different communication methods can also be seen in Fedro’s technology use. He is an 18-year-old teenager and works Mondays through Fridays in a town with no cell signal. His girlfriend lives in Oaxaca city and he uses the cellphone on Fridays to arrange a time on Saturday to spend one hour chatting with her through MSN messenger. They both chose an internet cafe that offers video cameras. When we asked him why they did not text or send pictures through the cellphone, and they told us that the costs were too high.

For all these youth, Gabino, Orlando, and Fedro, they all use IM'ing as a way to stay in touch with friends around Mexico. None of their friends are located in the US. In addition, they use IM more specifically to communicate with friends, caseta or fijo for family, and cellphone as a quasi-intermediary tool for noontime based communication. Fedro uses the cellphone to set up him IM conversations. Gabino who has to leave Bicuhuini for work, only uses it to contact his mother or to send text message to friends. Finally, Orlando reserves the cellphone for work.

Conclusions

Our fieldwork has revealed that youth manage their communication with their friends and family within a complex eco-system of ICT tools. They do this through the caseta, cellphone and IM. In looking at these youth who are the first adopters of cellphones, we find that cellphones are a part of larger ecosystem of technology that includes use of older and newer technologies. IM'ing has been adopted as an important part of their communication practices to supplement face-face chatting and interaction. Only when we examine the use of all these tools together do we get a more accurate picture of how youth from more economically well-off families can afford these tools and use them in innovative ways to work around policy, pricing and signal issues in rural, isolated, and landlocked Bicuhuini, Oaxaca.

The youth users manage a communication eco-system that is specific to the social and physical geography of Bicuhuini. This management is the attempt to weave together their Bicuhuini form of "connected presence." Whereas "connected presence" has been used to discuss how Western families manage various forms of communication from face-to-face communication, non-verbal gestures, and ICTs, we are sensing that a new

form of "connected presence" is emerging for the youth and their families of this study (Licoppe 2004). With less resources than regions with advanced telecommunications infrastructure, each individual youth who decides to forgo the long and dangerous migration to the US faces the challenges in building out networks and a career within Mexico. Our initial fieldwork shows how they are inventing unique ways to manage their rich social ties in a resource-poor area to carve our a livelihood that could support their family, and how they try to stay connected to their village and to information beyond the village.

The second aspect of our fieldwork touches upon the system of Usos y Costumbres that has long held Bicuhuini together. As more youth are taking advantage of an eco-system of technologies to reinforce their social ties and to search for colleges, they are no longer participating in a culture of migration—a culture that as long valorized the process of leaving one's home to work in the US and is part of everyday life (Ali 2007; Cohen 2004; Horvath 2008; Massey and Kandel 2002). Without the pressure to migrate, how easy will it be for these youth to participate in the Usos y Costumbres system once they begin investing in their own careers?[9] This is new trend in the history of contemporary Mexican to US migration, where a group of youth from a village dependent on remittances now have the option to opt out of migration due to the success of their fathers or relatives and/or to their own ambivalence towards the process, a trend that has recently been documented in the Yucatan by Minajares et. al. (2009).[10]

We noticed that youth who do not have to migrate can spend more time investing in their social ties. Youth, like Gabino, spend more time investing in their social ties within Mexico because they did not have to migrate and can therefore imagine a life as a working professional in their own country. For example, after Gabino graduates from high school, he plans to enroll in a university. Gabino’s dream, like many other youth of his same economic background, poses an alternative to the culture of migration. His story points to a culture of self-investment. This culture valorizes education, career path ,and the process of remaining in and making a living within Mexico. For example, when we saw Gabino in 2008, he was studying tourism at his high school (prepa) so that he works as a waiter in a tourist town. When we were chatting with him months later on MSN, he told us that he was changing his high school studies to biology. Even though this decision required that his family pay for him to repeat another year of high school, he felt it was important because he said that he wanted to work with sea animals near the ocean.

Gabino has made a big decision to change his high school major from a stable career in Mexico's tourism industry, a career that is already quite valorized if he were to learn English and become a waiter. But being a waiter was not his passion. He may not have networks and access to the best education system, what Gabino does have is the internet. He looks up information on Wikipedia and IM’s with friends about his plans. With these tools alone, his horizon can be set to his country and not the US. Our most recent visit in 2008 to the internet cafe in Juxtlahuaca with Gabino, he showed us his favorite biologist, Steve Irwin (Fig. 4). He admired Irwin's love for animals and was sad that he had died. For even youth who live in rural Mexico are trying to use various technologies as a way to increase their access to information, manage their communication and expand their career options. When we asked Gabino why he made these changes despite all the additional costs and schooling time, he told us, “*Sip, Sip, sabes alguien me dijo que siguiera mis suenos*,” which translates to “Yup, Yup, you know someone told me that I should follow my dreams.”

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1. In some cases, only one technology is documented because that is the only tool the people had access to at the time. But in many other cases, participants used both technologies and authors decided to only focus on one tool.

2. Wayne Cornelius is the principle investigator of the project. On our first visit in 2007, Leah Muse-Orlinoff was also a co-principle investigator.
3. some casetas offer faxing and copying services
4. From our ethno-survey administered in 2007, N-98; Source: Bicuhuini Fieldwork, Mexican Migration Field Research Project, Center Comparative Research Studies, University of California-San Diego.
5. Migrants from villages all around Mexico are known to work in the US with the hopes (at least initially) to one day return back to their hometown (Cohen 2001; Cornelius 1992). Oaxacan immigrants, like those from Bicuhuini, are known for a particularly strong affinity to their village, a common trait for people from indigenous villages in southern Mexico.
6. This figure includes youth, elderly, and all return migrants who are now settled in Bicuhuini
7. Although Bicuhuini sits along a freeway that was built 40 years ago, it is relatively isolated from timely information sources and social services.
8. Even though there is only one television channel that is received in Bicuhuini, there are cellphone commercials during the breaks. From the pirated dvds that they buy in Juxtlahuaca or Huajuapan de Leon, a town 3 hours away, they see movies of people using cellphones. When fathers return every few hours they bring back video gaming systems, dvds, and cds, that all show images of people using cellphones.
9. Serving a whole year may have been easier for their fathers who left non-professionalized jobs as farm workers or dishwashers—jobs that they could more or less return to within a year with minimal risk of losing work related human capital.
10. This could be one part of the larger story of the recent decline in migration to the US from Mexico (Preston 2009).