Please call ME.N.U.4EVER: Designing for 'Callback' in Rural Africa

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Abstract

Designers and developers are naïve about the ways impoverished people in rural Africa innovate new uses of mobile technology to circumvent access difficulties. Here, we report on the local appropriation of an USSD 'Callback' service in a rural community in South Africa's Eastern Cape which enables people to send free text messages and includes strategies that respond to severe constraints on message length and local communication protocols. This report shows that a participative approach, in which community members co-generate methods and interpret data, elicits major and formerly unreported findings. We describe the results of two sets of interviews about the use of cell-phones and Callback locally and the implications of this use for designing and realizing a media-sharing system. Our findings indicate that the community needs a system to charge phones and share media without consuming airtime and functionality for the 70-80% of people who do not own high-end phones. Use of Callback suggests people will manage a system to create, store and share content at a local 'station' but notify others about content using separate networks. Callback-use reveals local priorities that shape: the meaning of usability and utility; the ways people manage sequences of communication; and, the 'rules' that enable people to use Callback for multiple purposes and make sense of Callbacks despite ambiguity. These priorities inform introducing prototypes and contribute to exploring the communication patterns that might, subsequently, emerge.

1 Introduction

Greater use of mobile technology around the world is accompanied by a just as great naivety, amongst technology designers and developers, about this use. The number of cell-phone subscriptions globally is equivalent to 70% of the global population (ITU, 2010). However, most subscribers' circumstances differ from those who design and develop technology. Unlike the 50% of the world who live on less than $2.5 a day, technologists tend to be in the 20% minority living on more than $10 a day (Worldbank, 2010). Further, technologists usually inhabit research labs and design studios in cities and industrialized regions with easy access to electricity; which contrasts with 70% of the developing world's poor who live rurally (IFAD, 2011). Unfamiliarity with people's use of technology is acute for sub-Saharan Africa where the rural poor constitute 40% of the population (IFAD, 2011) and, with few exceptions (e.g. Bidwell, 2009; Ling & Donner, 2009; Bidwell, 2010), we rarely report on how different literacies or social and economic practices shape technology use. Here, we discuss appropriation of an USSD 'Callback' service in an impoverished rural community in South Africa which enables people to send free text messages and includes strategies that respond to constraints on message length and local communication protocols. Such, formerly unreported, insights would not have emerged without co-generating methods and interpreting data with community members.

We generated insights about the local appropriation of Callback in the first four months of a project which aims to design and deploy social-media-sharing systems suited to a community in South Africa's Eastern Cape and produce new ways to design systems for marginalized communities. These insights inform our iterative design and introduction of prototypes and contribute to baselines against which to assess changes in communication practices as we deploy prototypes. We start by motivating the need to consider localized

appropriation and factors at play in the Eastern Cape and summarising our approach to situating design. Next, we discuss two studies exploring the use of phones, in general, and Callback, specifically. We conclude with the implications of the local practices, which these studies reveal, for designing technology for, and with, the community.

People in developing regions innovate new uses of mobile technology to circumvent the costs of cellular networks tariffs often in ways that network providers did not anticipate. For instance, they make ('beep', or 'buzz') intentional cost-free missed calls (Donner, 2008) and use Internet Relay Chat (IRC) services, such as MXit (Walton, 2010). Service providers respond to appropriations in localized ways; consider the difference between 'Callback' services offered by a network service provider, MTN, in Nigeria and South Africa. Possibly to curb excessive beeping (Kreutzer, 2009) MTN enables subscribers in both countries to send a message through USSD services for free. In South Africa MTN promotes the service for use in emergency, such as when pay-as-you-go customers do not have airtime; so a subscriber dials *121*<cell-phone number># and then presses 'call' to automatically send a request to the recipient to 'Please call ….'. The request contains the caller's cell-phone number and a ten-character text intended to identify the caller. Users can personalize this text once per day using the command *???* <TENCHARACTERS>* and may send up to five free Callback requests per day to any South African cell-phone network. In Nigeria the same service has less constraints on message length or number of requests per day perhaps because, unlike in South Africa, not all service providers offer the service. Introducing technical solutions matched to local practices involves accounting for factors that shape appropriation. For instance, the MXit mobile chat service is very popular in South Africa, where data costs are relatively low; as it enables exchanging messages that are four orders of magnitude cheaper than SMS. However, MXit has made little impact in regions where local data costs are high, such as India.

To understand localized appropriation we must appreciate local communication practices. Economics influences phone-use in the Eastern Cape, which is one of South Africa's most impoverished regions. Our endeavor focuses on the region's poorest district, Nyandeni, where over 50% of households have no income, other than remittances from family members living elsewhere, pensions and child allowances; and, 80% of families survive on less than 10% of South Africa's national, median income for a working white man. However, communication patterns in Nyandeni are affected by factors as well as poverty. Written literacy locally is lower than elsewhere in South Africa, especially for older people. Further, villages in the region preserve many traditions due to topology (Figure 2), resistance to colonists, famine, invasion and neglect by successive regimes (Bidwell, 2009). Clans have often inhabited the geographically remote, but well populated region, for generations and kin are dispersed across the hills. Traditional communication protocols also interact with temporary migration for employment and a HIV prevalence of 29% of the population. People of parental age are those most likely to leave for work or to have died from HIV-related illness thus, compared with elsewhere in South Africa, the population declines dramatically between the ages 20 and 44 (Statistics SA, 2010). Grandparents or siblings often head households and a generation is missing from everyday practice and communication, which effects information flow (Bidwell, 2010).

2 Ethnographic Action Research in Situ

Our project contributes to an emerging situated Ethnographic Action Research (EAR) approach (Slater et. al., 2002). We build on insights about methodology generated in our previous work in four wards in Nyandeni; villages in neighbouring districts; and, relationships established via TransCape, a Non-Profit Organisation. TransCape is a collaboration between staff at Mdumbi Backpackers', the nearest rural hospital and community members of Nyandeni's Mankosi district (population: 11, 000). TransCape aims to respond to local educational, economic and health disadvantages by facilitating community members to implement their own projects to address concerns and develop local capacity. Over the past six years we applied different Action Research (AR), ethnographic and participative methods in technology endevours in the area (e.g. Chetty et al., 2004; Tucker & Blake, 2008, Tucker & Blake, 2010, Bidwell, 2009; Bidwell, 2010; Bidwell & Reitmeyer et al., 2010). This includes deploying Wi-Fi to connect clinics to a hospital and traditional leaders to each other; exploring communication practices and technology use; and, localizing media design. The scale and distribution means our ventures do not constitute a 'living lab' but have yielded rich insights into local cultural resources, social structures, power and institutions and ways to work with the community to define problems, opportunities and concepts in technology projects.

The ethnographically-versed designer (Author-1) lives in situ most of the time and, prior to this project's launch, had explored with TransCape different opportunities for social-media sharing. We launched the

project formally in Cape Town to introduce TransCape to external technologists and designers. TransCape's Chair noted that the recently revitalized Community Association had difficulties in sharing information across Mankosi; thus, we proposed a system that mixes local storage and retrieval of media items with distributed notification. We sought to identify communication problems, for the system to address; define social practices and concepts to explore; and, devise and execute plans with the community. So we recruited local people as fellow researchers (LRs) who could translate, linguistically and culturally.

A community member, and TransCape employee, who had been involved in earlier technology AR projects (Tucker & Blake, 2008), recommended four young men based on their: spoken English; print literacy; availability and enthusiasm; and that they lived in four of Mankosi's twelve villages, including that of the Headman (Mankosi's traditional leader). We commenced with workshops for ten days to discuss research practices, potential technology deployment, local power structures, demographics and phone-use; and we (LRs) were paid twice the minimum wage to attend. We also recruited a university student (Author-4) from Lwandile, a village bordering Mankosi, with whom we became acquainted in earlier work (Bidwell, 2009). Unlike most of the other LRs she is familiar with technology and had just completed her first degree in isiXhosa and media studies. We distributed initial tasks based on our (LR's) confidence in English and translation, personal disposition and interest. We (LRs) translated in repeated discussions with community members and traditional governors (Headmen, Sub-headmen, elders); recorded and translated video of local people telling stories and discussing concerns; and mentored each other about translation. We also interviewed people, in isiXhosa, about their phone use (Authors-5, 6) and about using Callback (Author-4).

In situ some divisions between experienced academic researchers and community members, be they paid LRs or participants in the community, fade. We (LRs) are informants about social structures and processes and our everyday practices, social networks, problems, interests and aspirations help situated academic researchers (e.g. Author-1) understand and adapt. In our initial workshops we (Author-1 and LRs) listened carefully, identified unfamiliar concepts in research and technology and structured our lived experience of the ways that people transfer information locally. We recorded our workshops on video and sometimes use these to reflect together. We (LRs) also continuously adapt and refine methods according to the local situation and gather and interpret data (e.g. our workshops stimulated us to include interviewing in some of our recordings of local people telling stories and discussing their concerns). We constantly negotiate meanings and refocus interpretations as our understandings, and those of other community members participating in studies, dialogue, planning or arrangements, evolve. Our personal wellness and access to this tight-knit community depends on our local accountability and, by living in situ, our actions are intimately discussed and influence participation in data gathering, and planning and realising the project. To an extent deep engagement addresses power relations between academics and poor community members; for instance, ethics are not just a matter of covering a research institution's liability. But, mostly, sustained situated research means that plans, methods and techniques account for technological and written literacy, language, communication practices, consent protocols, and the local meaning of concepts, such as confidentiality or privacy. Thus, for the interviews we describe here we devised open and closed questions and planned where, when and how to interview people and record data according to local factors.

Table 1: Age and gender distribution of people interviewed about owning (a) and using cellphones (b) and Callback (c)

	a) Non-phone owners. 4 villages in Mankosi, 1 day				**b) General Phone-use. 11 villages in Mankosi, 4 days**				**c) Callback Use. Lwandile, 2 days**			
Age	**Total**	**Mean Age**	***% (N= 19)***		**Total**	**Mean Age**	***% (N=117)***		**Total**	**Mean Age**	***% (N=16)***	
Range	**(N)**	**(years)**	*Male*	*Female*	**(N)**	**(years)**	*Male*	*Female*	**(N)**	**(years)**	*Male*	*Female*
14 - 24	3	19.0	*5*	*11*	60	19.5	*32*	*20*	10	19.5	*38*	*25*
25 - 34	-	-	-	-	29	27.9	*11*	*14*	1	28	*6*	*0*
35 - 44	2	37.0	*5*	*5*	15	39.2	*6*	*7*	3	39	*6*	*6*
> 44	14	58.4	*32*	*42*	13	51.2	*6*	*5*	2	47	*6*	*13*

3 Interviews about Cell-Phone-use in General

To gather data on phone-use we conducted interviews in 11 of Mankosi's 12 villages focusing on villages that community members proposed as sites for media-sharing prototypes (Fig. 2, Table 1). Thus, 66% of people we surveyed live in one of the five villages that were potential pilot sites. We interviewed people in their homes, shebeens (informal drinking establishments), along roads and paths and also at the football matches that many in the community attend on Saturday and Sunday. We interviewed 52 females and 64 males, with mean age 31.9 (Table 1), between Saturday morning and Tuesday evening to include people

who work outside their village on weekdays. We rewarded participants with 5R (0.75$US) airtime, which we transferred to a number they delegated after the interview. At end of the third day of interviews we reflected on our sample so far and became aware that we had recorded data for phone owners only and also that we needed data on the frequency by which people used Callback. Thus, for the final day (Tuesday) we interviewed phone owners and non-owners and asked how many Callback requests phone-users made per day. This one-day sample of 26 females and 31 males from four villages, included three potential sites for deploying prototypes (Fig. 2), and mostly we interviewed in people's homes as it was raining heavily. For all data we used descriptive statistics to analyse responses to closed questions and coded themes to interpret responses to open-ended questions based on our experience and ethnography locally.

3.1 Phone Ownership and Brands

In our one-day sample 56% of females and 76% of males own a phone and in our four-day sample 5% of people used another person's phone and two people owned more than one phone. There are as many phone owners aged between 14 and 24 as there are between 25 and 54 years. This reflects the local population distribution but is also influenced by literacy and financial resources. People aged under 50 years are twice as likely to own a phone as those older than 50 years and younger males are much more likely to own a phone than younger females. Participants often said that they were "*not educated to use the phone*" or "*I will ask to another people to make a call. I wished have my own phone but is too difficult to obtain money to buy a phone*". Gathering data about phone models is difficult as most devices do not display details prominently; but it appears that the majority of phones owned locally are low-end; e.g. nearly 80% of the Nokia phones we recorded were 1100, 1200 and 1600 models.

Table 2: Makes of phones participants own (a), network providers participants subscribe to (b), and where participants purchase airtime (c) - as percentage of phone-owners; and, the amount participants spend on airtime (d)

(a) Phone manufacturer (%)		(b) Network provider (%)		(c) Place airtime bought (%)		(d) Spending on airtime per week (Rand)				
				Shebeen	33	Age range	Male		Female	
Nokia	59	MTN	91	Spaza	32		Mean	stdev	Mean	stdev
Samsung	9			Café	11	**14 - 24**	9	11	15	20
LG	7	Vodacom	7	Particular person	10	**25 – 24**	18	10	14	16
Vodafone	7			Village (unspecified)	10	**35 – 44**	17	21	12	15
Motorola	3	Cell-C	2	Street-sellers in town	9	**45 – 54**	17	12	14	11
Mobotel	1			S/he re-sells it	3	**> 55**	6	0	6	0

3.2 Providers and Payments in using Cell-phones

All participants buy airtime to 'pay-as-you-go' and none have a contract or mentioned data plans. Most participants subscribe to MTN (Table 2) and 87% said that there was good signal where they lived. People buy airtime locally and most spend R7 (1.1 US$) per week (Table 2). There is business in re-selling; people buy between 0 and 100R airtime per week but some resell with a R2 mark-up on airtime valued at R5. Males generally spend more on airtime than females except between the ages of 14 and 24. Community members do not have access to grid electricity, domestically or commonly, so 69% always or sometimes pay on average 5.5R per week (stdev 5) to charge their phone at a spaza (small shop), shebeen, neighbours' solar panel or generator or at TransCape's premises.

3.3 Use and Use Preferences

Participants' responses to closed and open-ended questions show that what they use their phones for and what they like about their phones differs (Figure 1). The 115 phone-owners tended to mention four ways they used their phone. Almost all said they used their phones for Callbacks and making calls but these were not necessarily their favorite uses of phones; and, while they favour receiving calls that is not their most frequent use. Some 56 people noted uses of their phones other than the eight uses included in closed questions; most gave one additional use, one gave two additional uses and two said "*No else I am older*" or "*No another object*". Additional uses related to receiving calls; listening to ringtones and/or radio; changing wallpaper; audio recording; and, using Vodafone, a service available to Vodacom network subscribers. No participant mentioned making deliberate missed calls, 'buzzing', although people do so locally. Callback and making calls were the only uses that did not decline with age but, in a small sample of 16 people, the number of Callbacks made per day tended to increase with age. Those aged under 35 years said they use SMS more than those over 35 years and also mentioned a wider range of preferred uses of their phones.

More males said they used their phone for games but the best thing about their phone was SMS, Callback and receiving calls; and more females said the best thing about their phone was music.

3.4 Internet Use and Media Sharing

Eighteen people used Internet functionality, even if they do not realise it. Some 60% of Samsung but only 10% of Nokia phones that participants own are Internet capable and not all their owners use the Internet. Just 8 people use the MXit chat service but of these only three said they used the Internet. Internet users are younger, since the mean age of phone-owners in our sample is 28 years (stdev=11), but the mean ages of those who said they used their phone for the Internet and/or MXit is 26 years (stdev 5) and 23 years (stdev=4) respectively. Similar proportions of males and females use the Internet but twice as many males, as females, use MXit and they encompass a wider age range.

Some 32% of phone owners said they showed photos to other people and 29% sent photos and 29% sent music to other people's phones. Slightly more participants said that other people send tphotos or music to their phones. Similar percentages of males and females said they showed photos to others, but males were more likely to send photos to others. It appears many people who share music or photos do not know how they share, since 18% specifically mentioned Bluetooth but 32% said they did not know, or occasionally did not care, how they shared. Females and/or people aged between 25 to 34 years were more likely to mention they shared using Bluetooth. Participants said they "*Lack of knowledge of photo and Internet*" and people have differential knowledge about using their phone's functions. For instance, one participant said "*Lack of knowledge about send music and photos [but] play MXit and Internet*"; and a Nokia 5130 user who takes photos and music but does not use the Internet or share photos said "*not good for doing this object*". No one mentioned sharing by MMS, which is unsurprising given MTN's rate of R0.90 per MMS and the amount participants spend on airtime.

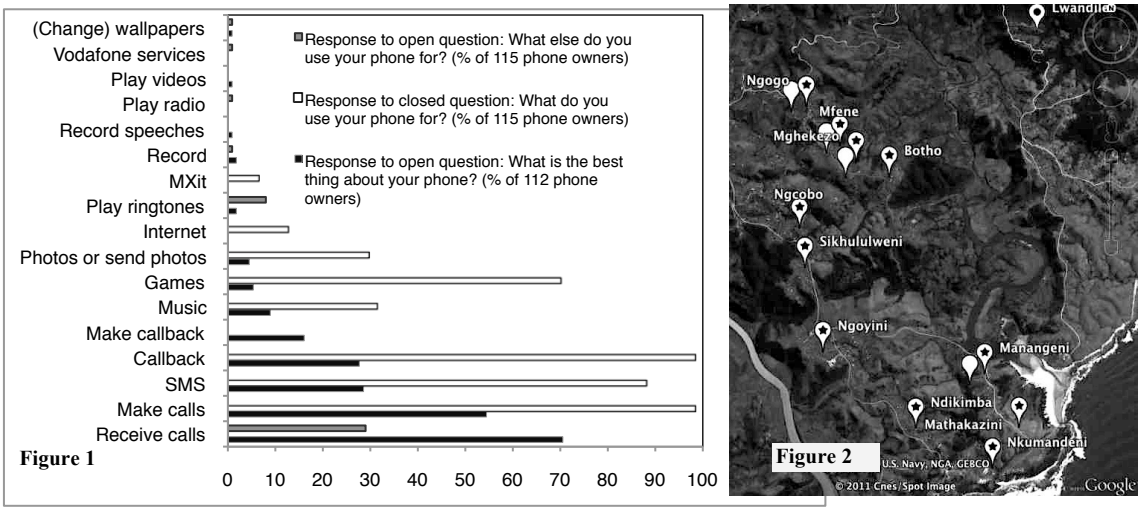

Figure 1: Phone-owners use and preferred use of phones in Mankosi **Figure 2:** Villages sampled in Mankosi for phone-owners and non-owners (white) and general phone use (star) and in Lwandile for Callback use (circle).

4 Interviews Focusing on Callback

Our interviews about general phone-use in Mankosi (described above) suggest that, while 60% of residents own a cell-phone, these are either feature-less or low-end 'feature' phones, rather than 'smart' devices. So nearly a third of phone-owners share media (photos, music) but few use the Internet, including MXit – the IRC services popular elsewhere in South Africa. The prevalence of Callback motivated us to conduct interviews focusing on Callback with 16 people, in Lwandile, a village bordering Mankosi (Fig. 2).

We (Author-4) asked 19 structured and open-ended questions, most of which related to Callbacks that participants had sent or received in the past two days. We recorded the frequency of personalizing, sending or receiving Callbacks and details about senders' and recipients' age, gender and relationship to each other. We asked participants to spell out their personalized Callback messages in the past two days and explain what they meant and why they personalised in that way. We also asked questions about participants' perceptions of Callback and Callback users. We interviewed 13 and 3 participants on 27 December and 3 January, respectively, but no participant mentioned Christmas, New Year or holidays in using Callback or

in the personalisations they showed us. Detailed diary-studies about phone-use in February and March in Mankosi and Lwandile, suggest our interviews yielded data on normal patterns of use. We selected participants across gender and age distributions that are consistent with our earlier interviews which showed there are as many phone owners aged below 25 years as there are aged over 25 (Table 1). Participants are 56% male and 44% female. Thus, we consider responses in two groups: 6 males and 4 females with a mean age of 19.5 (stdev=3.4, median=20.5): and, 3 men and 3 women with a mean age of 39.8 (stdev=7.6, median=41). All older participants live in Lwandile most of the time although half work outside the village. Nine younger participants live in Lwandile and one in Mthatha, the closest city, and only one works outside the village. We used descriptive statistics for responses to closed questions and derived themes, phenomenologically, from open-ended questions.

4.1 General Perceptions

Most participants said that they liked Callback because it is costless and some noted its flexibility across networks or cell-phones and ease of use (Table 3a). Some people did not like Callbacks; e.g. a female, age 48, said "*I do not like Callback because I don't know how to send it and it is difficult for me to learn. I can't read properly*". Donner (2008) proposes that people's intentional missed calls in East Africa are a form of phatic communication that signals or reinforces relationships between friends, family, or romantic interests. Some people mentioned, explicitly, that they use Callback to keep close to others (Table 3a); however, not all of these people personalise Callback. For instance, all the older participants said they liked Callback because they could personalise and/or it kept them 'close' to their friends whether or not they personalized. Participants who mentioned supportive purposes tended to have sent or received more Callbacks, in the two days before the interview, than those who mentioned practical purposes, e.g. arranging to meet (Table 3b).

Table 3: Participants' reasons for liking Callback (a) and purposes of their recent Callbacks (b) in Lwandile.

a) Reasons for Liking Callback	**%**	**b) Purpose of Callbacks**	**Age range (years)**	
			14 - 24	25 - 44
Are free and save airtime/money	69			
Allow personalization	25	Fun	25	36.4
Are flexible across networks and cellphones	25	Fun and support	12.5	9.1
Are easy to use	24	Support	37.5	36.4
Enable maintained familiarity e.g. "*let my friend knows I am thinking about them*"	19	Practical reasons and support	12.5	18.2
Allow frequent contact e.g. to "*stay in touch with 5 people a day*"	12.5			
Provide immediacy	12.5	Practical reasons	12.5	0

4.2 Males use Callback more Actively

In line with our general phone-use interviews, where more males than females mentioned Callback as the best thing about their phone, males seem to send and receive more Callbacks than females (Table 4). The responses of people of all ages tend to suggest they send Callbacks to people of the same or opposite gender to themselves equally but both younger and older people receive more Callbacks from people of the opposite gender, as 55% and 70% of their senders were of the opposite gender to themselves, respectively. Participants received Callbacks from similar percentages of males and females but, since some participants sent more Callbacks than others, overall 65% of their Callback recipients were female.

Table 4: Age and gender affects if people personalize and to/from whom they send and receive Callbacks in Lwandile

Age Range (years)	**Number of personalisations**		**Number of people sent to**		**Recipients' Age**		**Number of people received from**		**Senders' Age**	
	Mean	stdev	Mean	stdev	Mean	stdev	Mean	stdev	Mean	stdev
14 - 24	1.5	0.5	2.2	1.6	20	6.4	2	0.9	18.7	4.5
24 - 48	0.5	0.6	1.7	1.0	27	7.8	3	0.9	21	4.7
Gender	**Number of personalisations**		**Number of people sent to**		**Recipients' Gender**		**Number of people received from**		**Senders' Gender**	
	Mean	stdev	Mean	stdev	Male	Female	Mean	stdev	Male	Female
Male	1.1	0.8	1.2	0.4	33%	67%	1.8	1.5	63%	38%
Female	1.1	0.7	1.1	0.7	38%	63%	1.3	0.8	37%	64%

4.3 Younger People Use Callback More Actively

Consistent with our survey of general phone-use in Mankosi, older participants received slightly more Callbacks than younger participants, but sent to fewer people and personalised Callbacks much less. Older

people received Callbacks from between 1 and 5 persons but sent either no Callbacks or just to one person. In contrast, younger people received Callbacks from between 1 and 4 persons but sent Callbacks to between 1 and 5 persons. All participants tended to receive Callbacks from people who are younger than those people to whom they send Callbacks and older and younger participants said 50% and 70%, respectively, of the senders of the Callbacks they received in the proceeding two days were people they often sent Callbacks to themselves. The senders of Callbacks to younger and older participants were aged 13 to 26 years and 18 to 29 years, respectively, but the recipients of younger and older participants' Callbacks were aged 13 to 37 and aged 18 to 40, respectively. Importantly, younger people personalise their Callbacks twice as much as older people (Table 4).

4.4 Callback is for Friends and Family

Generally people emphasise sending Callbacks to friends. However, younger people send more Callbacks to friends. Older participants sent more Callbacks to friends (50%) than they received from friends (43%) but younger participants were equally likely to send Callbacks to (56%) or receive from (56%) friends. In the two days prior to the interviews, 31% and 33% of Callbacks sent by younger and older participants, respectively, were to a family member; but 44% and 43% of Callbacks they received were from family members. Both older and younger participants receive Callbacks from relatively more family than they send Callbacks to family. Older people sent to slightly more colleagues/co-workers (17% of their recipients) than younger people, who also included those they schooled with (13% of their recipients).

All participants said that all recipients and senders of their Callbacks in the two days before the interviews were typical even though it was Christmas and New Year, when many people come home for the festive season. Older people were much more likely to have sent and received Callbacks from people who live in Lwandile than people who live far away, such as in a city, and were more likely than younger people to have seen the recipient of their Callbacks in the past two days. Older participants said that 83% of senders of Callbacks they received and 60% of recipients to whom they sent Callbacks lived close to them and that they had seen 60% of the people to whom they had sent Callbacks in the past two days. In contrast, younger participants said that only 27% of senders of Callbacks they received and 50% of recipients to whom they sent Callbacks lived close and they had seen 50% of the people to whom they had sent Callbacks during the past two days. Thus, sending Callbacks may enable younger people to connect to people living far away.

4.5 Personalisation

Analysis of personalisations suggests various characteristics related to the function, content, language and context of personalizing. We grouped the content of personalisations into serving five main functions.

Performing Identity: Some 28% of personalisations in the examples of Callbacks that participants showed us were their names or nicknames; further, the names that people used in personalising provide some context to recipients. People in Eastern Cape often have many names: family and clan names; names they adopt themselves for use with non-isiXhosa speakers; and, names given by: their parents at birth, elders at circumcision, husbands on marriage and friends and family informally [Bidwell, 2009]. Two young men, aged 17 and 20, said they personalised with their nicknames because, as one said "*Its how my friends call me*". Another young man, aged 22, personalised with different nicknames 'Please call BG.BRO …' and 'Please call CHIZBOY …'. Older participants indicated less diversity in the names they use to personalise; for instance, a female, aged 46, said she personalised with her first name so that the recipient "*know where the Callback comes from*".

Rendezvousing or Co-ordinating: 12% of participants' examples directly related to meeting. For instance, a male aged 14, said "*I wanted the person to come to my place*", so sent a message in abbreviated isiXhosa meaning "*come here*": 'Please call YIZA …'; and a woman, aged 35, personalised her Callback because she said "*I wanted the person to know that I am on my place safe*": 'Please call @HOME …' .

Managing Communication Flows: Some 28% of participants' personalisations functioned to organise phone communication. Personalising with names can express requests for a phone response; e.g. one participant personalised with his name to elicit a reply from a friend: "*I was thinking of him and I wanted to know where is he*". However, the multiple functions of Callback can mean people must distinguish the purpose of eliciting a call, explicitly; so a 23-year-old female sent 'Please call NO.AIRTIME …' and said: "*I wanted to show that I don't have airtime to call*". Other participants' Callbacks express availability for communication; e.g. a 23-year old female said "*I wanted to let the caller to know the person he wanted was*

not around" so she personalised in abbreviated isiXhosa: 'Please call AKEKHO …' and one male, aged 19, sent messages asking friends to log onto MXit: 'Please call LOG.MXIT …'.

Interpersonal support: Many personalisations that functioned to organise communication also related to support. However, some Callbacks were more specific about support; e.g. a male, aged 38, said "*I wanted the person to call me and letting her know I am sick*", so sent 'Please call IM.SICK …'.

Phatic Communication: Some 22% of personalisations related to intimacy, romance or maintaining a presence in recipients' lives. E.g. a male aged 22, said he personalised "*to express my feelings*", and thus sent 'Please call U.R.MINE…'; a female, aged 23, said "me for you" by sending 'Please call ME.4U…' and another female, aged 21, said "*I wanted my contacts to have a blessed day*", thus sent 'Please call GOD-BLESS …'. Donner (2008) notes people develop expectations of phatic communication in relation to its role in relationships between friends, family or romantic interests; and, a male participant observed that in his relationship: "*She demands my Callback everyday and I demand hers*".

People draw on relational cues in sending and understanding personalisations and these are affected by generational differences. Youth personalize their Callback more than older people, some of whom do not know personalisation exists or the language used to personalise. A female, aged 48, said: "*I do not know where to check, I just see there is a message from that person*". Some older participants are aware of personalization; e.g. a male, aged 44, said "*I don't personalise when I send Callback my number appears to that person*". Others perceive personalisation as related to youth; e.g. in referring to younger people's Callbacks a 46-year old woman said: "*I do not usually check because I have their numbers and they personalise for their friends*". Our observations confirm that youth will send Callbacks to their mothers with intimate personalisations intended for friends or lovers, knowing that their mothers will not read it.

The personalisations, described above, show that people use both abbreviations and periods '.' to evade the constraints of the character limit. The emergent language involves various coding rules; e.g. two young men explained that their personalisations mean "I miss you" but their messages differed; a 14-year-old sent 'Please call I.MCU …' and a 22-year old sent 'Please call I.MISS.U …'. It appears that constraints on character limit in Callback coupled with perspectives on language in Eastern Cape contribute to new practices of abbreviating isiXhosa. Unlike studies on SMS exchanges elsewhere in South Africa, (Deumart & Oscar Masiniyana, 2008), we found some participants abbreviate isiXhosa when personalizing; e.g., a female, aged 14, sent two messages asking the recipient to call her, one in English: 'Please call URGENTLY …' and another abbreviating a comparable isiXhosa phrase: 'Please call NGOKU …'.

4.6 Rules Governing Callback and Callback Personalisation

Overall, participants comments indicate that they distinguished between people in deciding to send Callbacks; thus, 70% and 60% of people in the younger and older groups, respectively, said there are people that they would speak to or SMS but to whom they would never send a Callback. Younger people were more likely to say that there were people to whom they would speak or send an SMS to but would never send a Callback. Participants' responses indicate they determine appropriateness in sending a Callback according to several factors. One factor relates to familiarity with others' use of Callback and constraints on their use. Some participants, especially in the older group, indicated that some people simply do "*not respond to Callback*"; others explained that they accounted for recipients' technological or written literacy. Younger participants said, about those to whom they would not send Callbacks: "*She is old and does not understand Callback*" and "*He cannot read*". Another factor in determining appropriateness in sending a Callback relates to respecting that some people personalize Callbacks as their only means to send messages and senders' and recipients' relative financial positions. Thus, a participant, aged 14, said "*I don't have airtime. So I send all my contacts Callbacks*". A related factor shaping decisions about sending a Callback links to older people's understanding that Callbacks are designed to elicit responses that incur charges. So, another male, aged 14, said he would not receive a Callback from his mother because "*She is my parent and is the one who buys me airtime*". Similarly, a male aged 44, said he would not receive a Callback from someone because "*She have more money*". Understanding his own financial ability relative to others may partly explain why one participant, age 48, said "*I do not send Callbacks* [at all]".

Our interviews generated insight into some of the rules governing sequences of communication involving Callbacks. Partially due to greater financial means older people are more likely, than younger people, to receive a call from the recipient of their Callback. Older participants noted that 75% of those who replied to their Callbacks did so by calling them but younger participants said only 20% of recipients called in response to their Callbacks and 30% of those recipients who replied by sending a Callback. People's

expectations about the form and flow of communication account for a familiarity with recipients' Callback behaviour and whether or not they knew the recipient had received their Callback and/or read their personalisation. Some 56% and 67% of younger and older participants, respectively, said they knew people from whom they would receive a call or SMS but who would never receive a Callback. One male, aged 14, said he would not receive a Callback from someone he knows because that person "*knows nothing about Callbacks*"; while a 48-year-old woman said she never received Callbacks from her colleagues as "*they know I do not respond*". Both younger and older people said they knew that recipients had checked their Callback because they had responded by: calling (31%); with a Callback 25% (e.g. they "*send Callback also, answering my question*"); with an SMS (18%); by logging onto MXit (6%); or, in some non-specified way (12.5%). Younger participants said they knew that all their recipients checked their personalisation because their Callback elicited an appropriate response; but only 80% of older participants could say the same. Younger people are more likely to read the personalised text in the Callbacks they receive; since 70% of younger, but only 50% of older participants said they checked the personalisation of incoming Callbacks. As, one 35-year old man said "*I just read who it is from and delete*".

Another rule relates to determining the suitability of personalising Callback messages. As earlier examples illustrate people send personalised Callbacks to both those they do and do not intend to read their personalization. Each day users can send five Callbacks but can personalize only once so Callbacks often carry dual meanings. This extends Donner's (2008) observations that senders and receivers distinguish among beeps using their knowledge of the situation and the people involved in the exchange. For instance, an older family member is alerted by a Callback sent to them by a younger family member but knows that the sender does not expect them to read the message. Thus, both the Callback and the content of the personalized text work together as 'digital homonyms' (Donner, 2008) and senders and receivers delineate different meanings which, mutually, reinforce and rely on relational and contextual cues.

5 Reflections and Design Implications

The results of our interviews on using cell-phones and Callback have significant implications for designing and implementing a media-sharing system suited to an impoverished rural community. Our insights illustrate that even in a short (18-month) project a participative approach can elicit major findings and inspire novel research. Across the process of planning, arranging, conducting and reflecting on interviews we learnt about Callback,and about research methods. We have since recruited three more local researchers and have devised new techniques and uses of technology in interviews; e.g. diary studies using MXit.

Cell-phone use in Mankosi indicates that people need a system to charge phones and share-media without consuming airtime. Currently, most phone-users spend: 40% on airtime; 16% on the airtime re-sellers' markup; and, 44% on charging. Accessible charging, with community-set levies, may enable people to extend their use of costed phone services. Media is important to phone owners and many people share media but the system must enable creating and sharing media without using sophisticated handsets, since 40% of community members do not own phones and most phones owned locally are low-end. Often people share by looking at, or listening to, a handset together. This is not just because they lack knowledge about, or money for, network data services but also because face-to-face communication is important (Bidwell, 2009). Thus, our prototype enables users to create media artefacts and/or upload and download media over Bluetooth at local servers ('stations'). The system enables people to alert others of the presence of artifacts at the station using separate networks, including Callback and MXit. Phone-users are already familiar with managing multiple communication channels depending on context, even if they are unaware of the core technologies, which suggests that local people will manage a system involving entirely different networks.

Use of Callback reveals some of the priorities that shape the meaning of usability and utility locally. Relatively many people reported that Callback was easy; yet the system would fail on any usability metric. Using the Callback service requires recall over recognition and remembering arcane numerical strings to invoke functionality and the system provides no context information or feedback. Thus, and yet again (Winschiers & Fendler, 2007), the assumptions that underlie standard HCI measures of usability and utility are mismatched with African priorities. In daily life people do not aim to minimize the time spent communicating with others but devote substantial effort to face-to-face speaking (Bidwell, 2010). They judge the demands of using Callback against the role of communicating. Callback has high utility when there are few other accessible channels, so people use it rather than buzzing because low-end phones do not record missed calls when unconnected to the network (e.g. when phones are uncharged) and use it's free messaging rather than SMS because of cost. Regular use means people adapt to using the Callback system.

The way people manage sequences of communication around Callback informs introducing the prototype's notification system and contributes to exploring how communication patterns evolve. Our analysis of data presented here, and subsequently gathered in diary studies, shows rules account for people's familiarity with each other's literacy, financial ability, social networks and inter-generational and family protocols. These rules enable people to make sense of Callback despite its multiple functions and dual meanings and communicate appropriately in different social groups.

6 Conclusions and Ongoing Work

Every community's communication practices adapt to different constraints. Situating methods, through deep engagement with impoverished communities, reveals patterns that may be mundane and prevalent but are obscured by the interactions of the wealthy and sweeping statistics, such as that there are more active SIM cards in South Africa than people (ITU, 2010). We have recently deployed the first prototype of a media-sharing system that acts, primarily, to probe how the community develops and reinforces socio-technical rules in sharing media. While developing this prototype we analysed over 20 hours of participant-collected video to understand face-to-face communication and storytelling practices and continued to gather data on phone-use. We (LRs) also adapted a diary-study method to observe the ways community members manage mixtures of face-to-face and mediated communication in different social groups and asynchronous and synchronous texts (Callback and MXit). This yielded further data on the rules governing sequences of interactions to which we apply conversation analysis to explore turn-taking and implicit cues.

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