Microentrepreneurs and mobile phones: Enabling and amplifying network ties in Kigali, Rwanda

Jonathan Donner

Microsoft Research, India (as of 11/1/05)
jonathan@jonathandonner.com

Presentation to:
USC Workshop on Wireless Communication and Development
8 October 2005

Notes:

Research support provided by the postdoctoral fellows program of the Earth Institute at Columbia University

Beeping findings (slides 20-26) are drawn from *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa* at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York, May 2005.

Rwanda

2001 GDP Per Capita $242

Slowly recovering from 1994 genocide

70% of population (7.5 m) lives below poverty line

90% engaged in agriculture

5% living with AIDS

.3 land lines per 100 inhabitants; 1.36 mobile lines

Sources: CIA World Factbook, International Telecommunications Union; photo from www.mountaingorillas.org

Agenda

Microentrepreneurs and Mobiles

RQ1: Whom do they call…and why?

RQ2: Changes to Social Networks

Broader Findings: Beeping

Discussion

Innocent
The neighborhood baker

- Makes samosas and cakes for clients around Kigali, Rwanda
- Started business with minimal capital: uses a borrowed stove
- With the mobile, has expanded his customer base
- 30% of his clients are now outside Kigali, and can only contact him using the mobile
- He has increased his income and recently moved into a bigger house

"I want to be the McDonalds of Baking"

Afsa
A hair braider

- Moved to Kigali alone, after losing her family in the Rwandan genocide
- Saved for months to buy the phone, so that clients could give her number to more prospects
- Mobile helped her business grow from 3 clients a week to 8-12 per week (each client pays $10)
  - Plans to open her own salon
- Has an emergency fund saved in case mobile is stolen
- Also calls her cousins in Gisenyi.

"When I got the mobile, I began to see braiding as a business – as work – and could see a future"

Afsa and Innocent are microentrepreneurs

Microenterprises and SMEs are critical to the economies of developing nations

- Micro-enterprises have 0-5 employees
  - Urban: Small shops, informal traders, vendors
  - Rural: small or subsistence agriculture.
- SMEs have 5-100 employees
- Large proportion of urban households involved in microenterprise
  - Includes self-employed and part-time businesses
- Force for growth, poverty alleviation, or both? (Mead and Leidholm 1998)

Donald C. Mead and Carl Leidholm, "The Dynamics of Micro and Small Enterprises in Developing Countries," *World Development* 26, no. 1 (1998).

Telephony is the ICT most relevant to microentrepreneurs: Duncombe and Heeks on Phones and MSMEs

"Phones are the information-related technology that has done the most to **reduce costs, increase income** and **reduce uncertainty** and risk.

Phones support the current reality of **informal information systems**, they can help **extend social and business networks**, and they clearly **substitute for journeys** and, in some cases, for brokers, traders and other business intermediaries.

They therefore work "with the grain" of informality yet at the same time help to eat into the problems of insularity that can run alongside.

Phones also meet the priority information needs of this group of **communication rather than processing of information**"

Duncombe and Heeks (2001) "Information and Communication Technologies and Small Enterprise in Africa: Lessons from Botswana". (Manchester, UK: Institute for Development policy and Management)

Understanding mobile use by microentrepreneurs adds to two ongoing discussions

	Productivity	**Change**
ICTs and Economic Development	**Lower transaction costs and replace travel** (Norton 1992, Saunders et. al. 1994)	**Access information** (Hudson 1984, Eggleston et. al 2002) **Increase security** (Saunders et. al. 1994) **Reduce isolation** (Saunders et. al. 1994)
ICTs and Social Structures	**Strengthen existing relationships** (Thorngren 1977, Agre 2002, Harper 2003, Goodman 2005)	**Enable new relationships** (Ball 1968, Hampton 2003, Wellman 2002)

Methods

A survey of microentrepreneurs' calling behaviors

- 277 interviews
- Purposive sample in Kigali's streets/markets
- 6 trilingual interviewers
- All microenterprises with <5 employees, and a mobile
- Follow-up qualitative interviews

Sample

- 69% male
- Median age 32
- 26% primary school, 54% secondary
- Retail, services, construction

Focus on ***10 recent calls*** in call log

- Incoming, Outgoing, SMS
- Whom was it with? What was it about?
- How long have you known them?
- Network generator for 5 of 10 calls
- Captures actual behavior

Agenda

Microentrepreneurs and Mobiles

RQ1: Whom do they call…and why?

RQ2: Changes to Social Networks

Broader Findings: Beeping

Discussion

Research Question #1

To what extent are Kigali's microentrepreneurs using their mobiles for business, versus for personal reasons?

How is this changing over time?

Mobiles are tied to a person, not to a location

- Makes personal-business divisions more complex and important
- Entrepreneurs who own only a mobile will conduct (all) calls through that channel

Studies of mobile use

- Most common use of mobiles in rural Tanzania and South Africa is for contact with friends and family (Goodman, 2005)

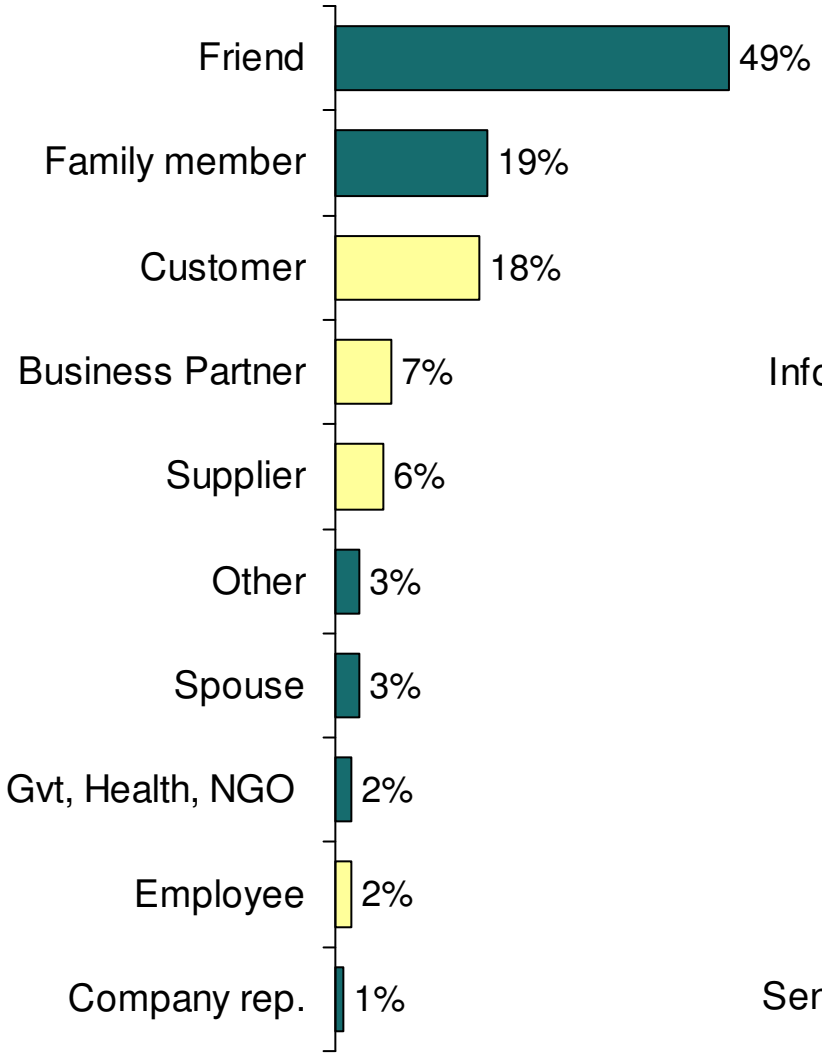
Studies of *public* phone use

- Ghana 65% personal, 17% economic (Bertolini 2001)
- India 50% of calls by farmers to family and friends (Blatman et. al 2003)
- Bangladesh
  - 44% social, 42% remittances (Richardson et. al 2000)
  - 47% economic, 35% social (Bayes et. al 1999)

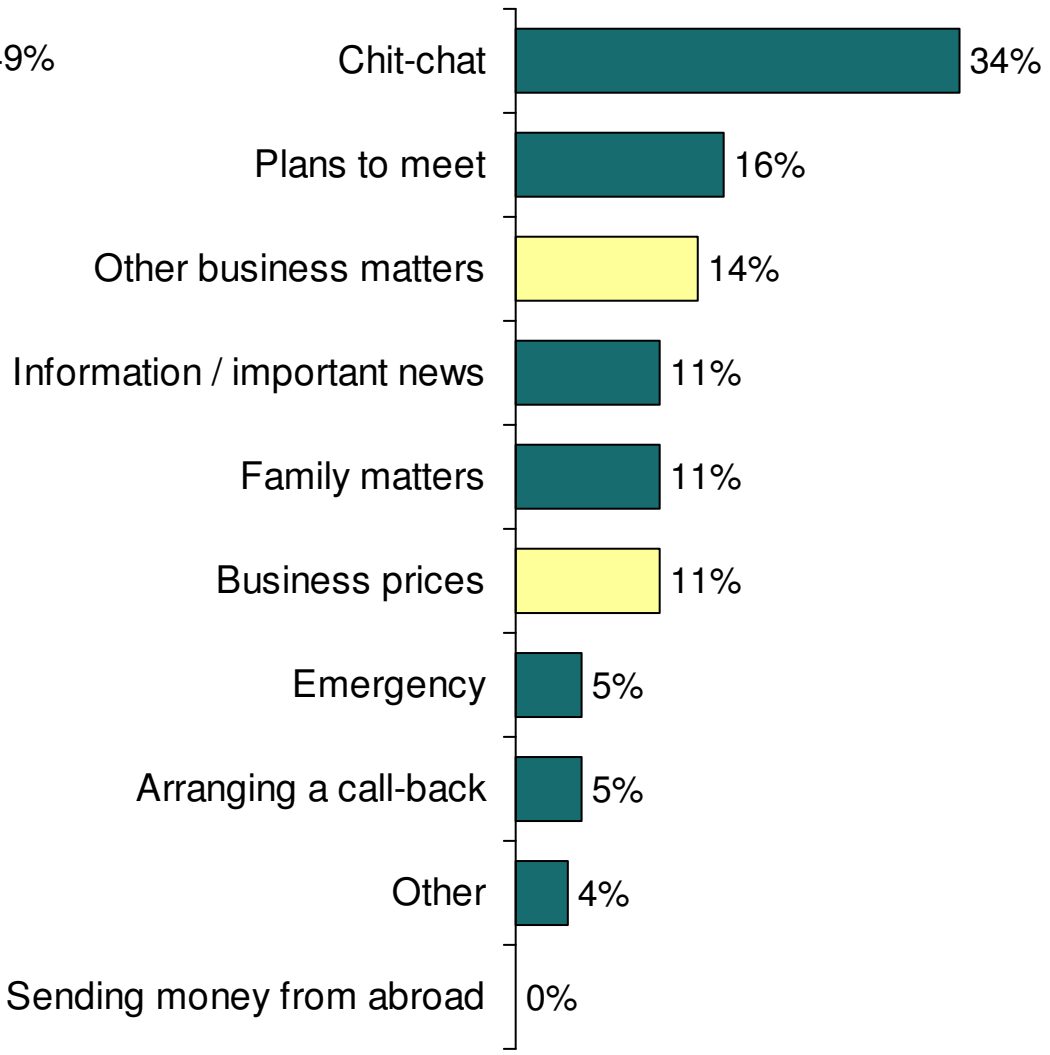
Results: Whom do they call…and why?

2/3 of calls are personal, 1/3 are business-related

Call partners (n=1817)

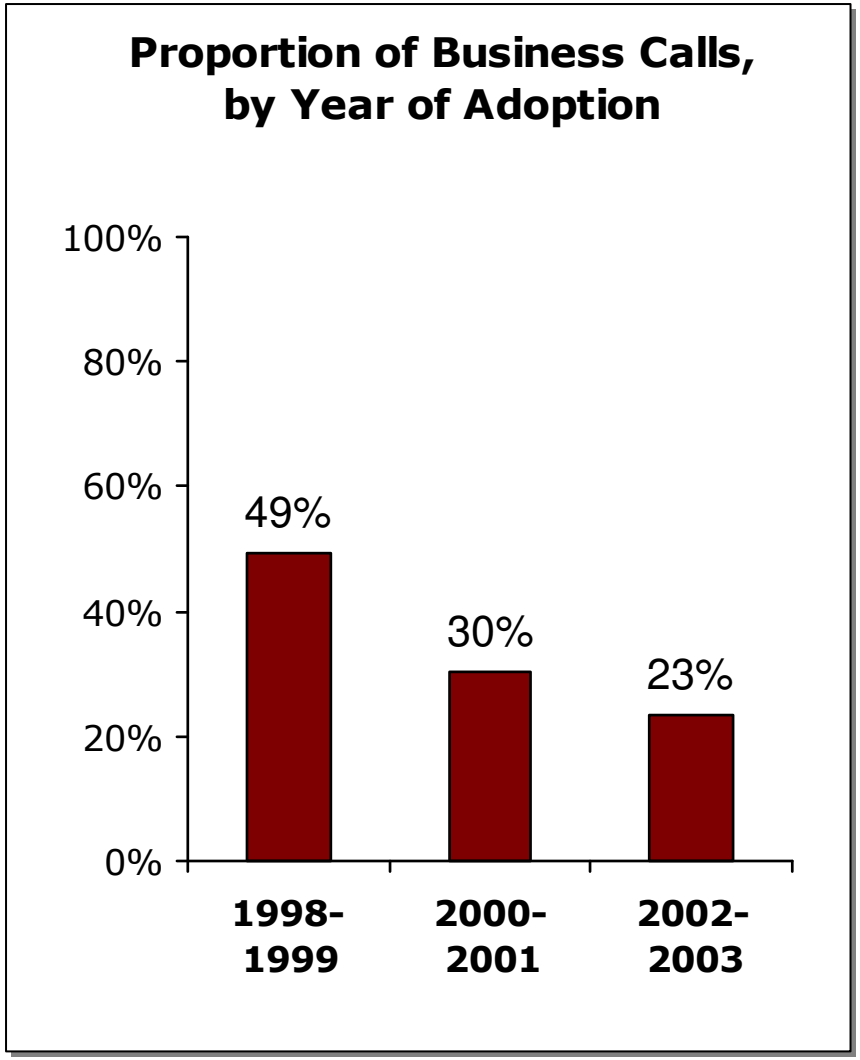


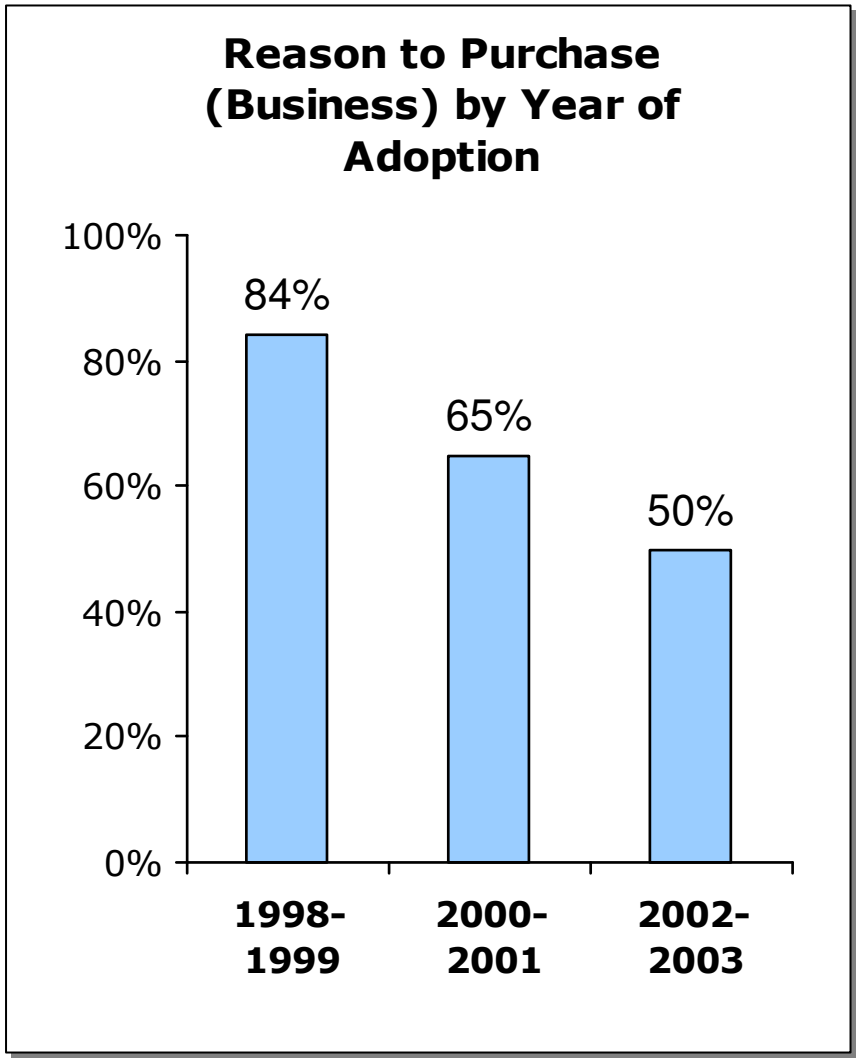
Call Content (n=1755)



Results:

Early Adopters Are More Focused on Business





Fractional Logistic Model Results for Proportion of Business Calls on Call Log

	Coef.	Robust Standard Error
Control Variables		
Spending Per Month	0.34	.082
Gender (male)	-0.011	.178
Age	-.002	.011
Education	-.274***	.094
Number of Employees	.013	.068
Has Landline at Home	-.622***	.201
Has Landline at Work	-.008	.178
Research Variable		
Year Purchased Mobile	-0.13***	.059
Constant	261.4**	118.7
Number of cases	215	

Note. *,**,*** represents significance at p<.1, .05, and .01 respectively.

Agenda

Microentrepreneurs and Mobiles

RQ1: Whom do they call…and why?

RQ2: Changes to Social Networks

Broader Findings: Beeping

Discussion

Research Question #2 - Changes to Social Networks:
Do mobiles enable new social network ties, or amplify existing ones?

It is important to disaggregate the impact of the mobile according to function (business vs. personal), and access to other telephones

One method is to look at new entrants to the network – those whom the mobile owner met after purchasing the mobile.

Hypotheses

1. New entrants are more likely to be business-related ties (rather than friends or family)
2. New entrants are more likely to be found on the call logs of those without a business landline
3. New entrants are more likely to be found on the call logs of those without a home landline

Method

- Logistic Regression on 1400 call alters (280 participants, 5 calls each)
- Dependant Variable: ***Is the call partner new to the user's network?***
- Independent Variables: ***Work and Home Landline Ownership, Relationship Type (business, family, friend)***

Results

Significant for Relationship Type & Work Landline Ownership

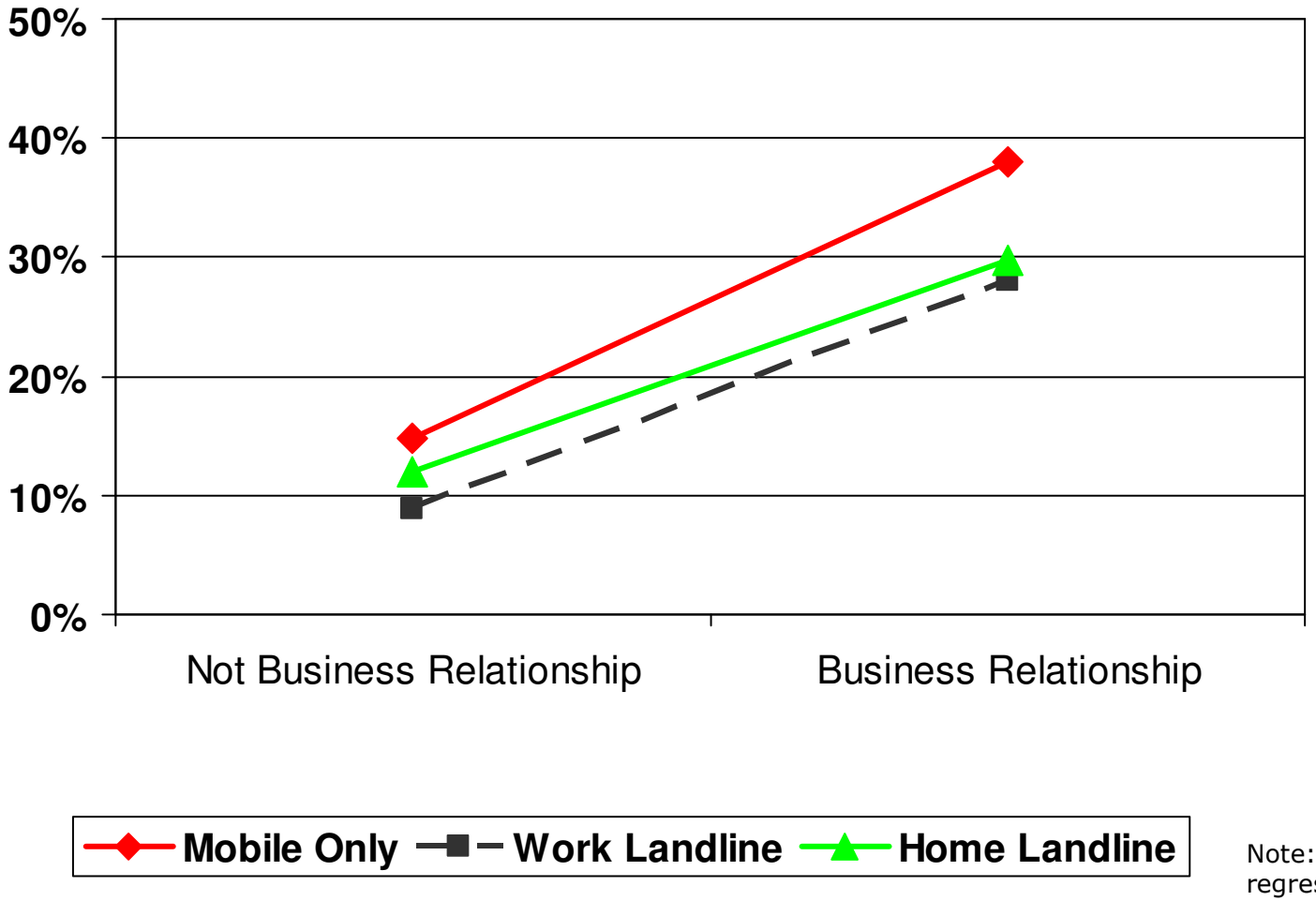
Un-standardized Logistic Regression Coefficients Predicting Whether Call Partner is New to User's Network (*n*=1019)

Controls:	
Gender	.086
Age	-.026*
Education	.228*
Year Purchased Mobile	-.163*
Monthly Spending	.155
Number of Employees	-.044
Owns Home Landline	-.280
Owns Business Landline	-.621*
Business Relationship	.948*
Family Relationship	-1.33*

* Significant at p<.05

Results
Significant for Relationship Type & Work Landline Ownership

Estimated Probability that a Call Partner is New to a User's Network



Note: From logistic regression, N=1019

Are mobiles amplifying existing relationships, or enabling new ones?

They are doing both

- Amplifying overall communication frequency with friends and family
- Enabling communication with new business contacts, particularly customers

New customers are good for economic development

- Remember Afsa and Innocent's success

Agenda

Microentrepreneurs and Mobiles

RQ1: Whom do they call…and why?

RQ2: Changes to Social Networks

Broader Findings: Beeping

Discussion

What is beeping?

To Beep Someone

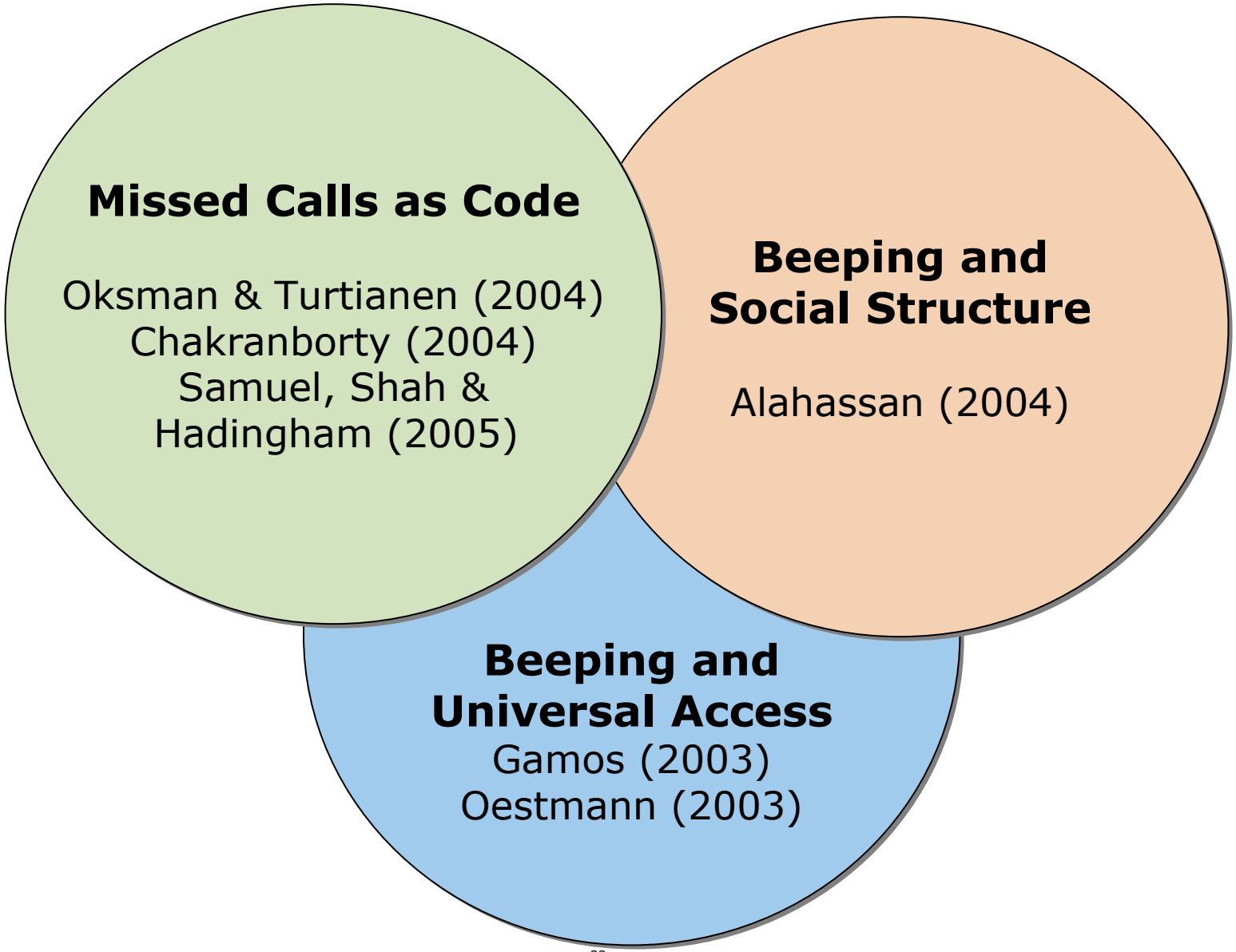
- Call his or her mobile and hang up before the call is complete
- All the mobile owner sees is a "missed call" in the call log

Beeping is…

- Easy, thanks to the handset's address book and call log
- Tempting, due to calling party pays and prepay minutes
- Necessary, due to economic scarcity and the high tariffs

Donner, Jonathan (2005, May). *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. Presented at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York.

Mentions of ‘beeping’, ‘flashing’, ‘bomb calls’, and ‘missed call culture’



"When someone beeps you, you know the reason"

- Rwandan University Student

"Beeping is a habit that transcends all social classes" – Tanzanian Columnist

"I got loads of flashes on my phone in the days following my arrival. So many, dear reader, that I almost got blinded by them" – Ghanaian Columnist

"I was angry with my so-called friends who 'beep' me all the time – blackmailing me into calling them back….I can understand someone beeping me once and a while. My problem is that so many Ugandans have turned beeping into a profession"

- Ugandan Columnist

Research Question:

What are the rules of beeping?

Data:

15 Open-ended interviews with microentrepreneurs and university students

Discussion:

What do the rules tell us about the evolution of ICT use in societies?

Donner, Jonathan (2005, May). *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. Presented at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York.

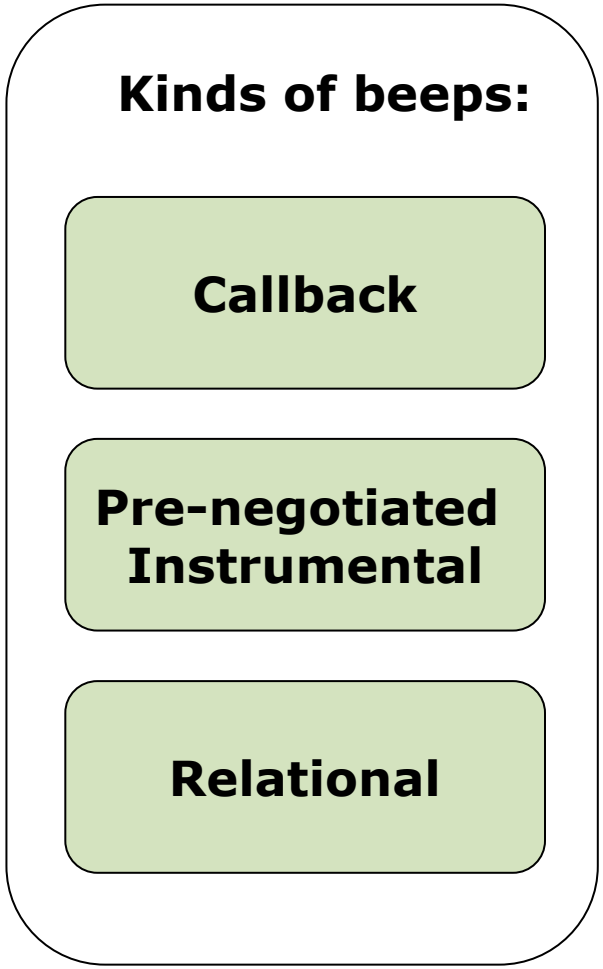
The Rules of Beeping

> "Sometimes people don't get this at first, then after one mistake, it works…With new people, it is tricky. They need some orientation"
>
> - Nicole , Student

1. **Usually, a beep means "call me back"**
2. **Sometimes, beeps can mean something else**
   - A beep can convey a short message for free – "pick me up now"
   - A beep can mean "I'm thinking of you"
3. **Not everyone should beep to say "call me back"**
   - The one with more money should pay for the call
   - The one with airtime on their mobile should pay for the call
   - Customers send beeps, they don't receive them
   - Women send beeps to suitors, they don't receive them
4. **Do not beep too frequently, or at the wrong time**
5. **If a recipient does not reply, beep again**
6. **Explain these rules to new users**

Donner, Jonathan (2005, May). *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. Presented at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York.

What is the meaning of an empty beep?



Critical role of relational and contextual cues

- Happens between known relational partners
- Meanings vary between relationships
- Meanings vary within a relationship, according to context/time of day
- Meanings and appropriateness evolve, with relationships, over time
- Daily "micro-negotiations" **reflect** and **reinforce** existing relational and social cues

Beeping as user adaptation

- Adaptive Structuration Theory (Giddens 1984, Yates & Orlikowski 1992, DeSanctis and Poole 1994)

Donner, Jonathan (2005, May). *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. Presented at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York.

Beeping and Economic Development

- Allows for redistribution of tariffs from rural areas to richer urban users (Gamos 2003, Oestmann 2003)
- Beeping and overseas diaspora?
- Dramatically reduces cost of using mobile
- Used in commerce as well as family life
- Carrier and manufacturer reactions should depend on ratio of callback beeps to relational / pre-negotiated beeps

Donner, Jonathan (2005, May). *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. Presented at "Questioning the Dialogue: 55th Annual Conference of the International Communication Association", New York.

Agenda

Introduction

Microentrepreneurs and Mobiles

RQ1: Whom do they call…and why?

RQ2: Changes to Social Networks

Broader Findings: Beeping

Discussion

Most calls are not "about" business/economics

How do we best understand the "development impact" of mobiles if two-thirds of calls are not made for specifically economic purposes?

Calls that contribute to economic development

- Calls to partners, suppliers, customers, and employees
- Calls that yield ideas or information on markets, customers, etc.

Calls that contribute to quality of life

- Calls to family and friends
- Chit chat, important news
- Coordination of social activities

'Complex' calls

- Diaspora, remittances and family finances
- Beeping behavior
- "to be reachable"
  - Work calls at home
  - personal calls while working

If mobiles enable and amplify business activity, can we help microentrepreneurs acquire and use mobiles?

- ***Regulation and policy*** to increase competition and reduce call tariffs, particularly in rural areas
- ***Donor and NGO*** activity to allow loans to pay for handsets, insurance for stolen phones
- ***Provider actions***, like Smart Communications in the Philippines, to help individuals to top-off prepay accounts
- ***New technologies and business models***, (micro-telcos, VoIP, etc.) to further reduce cost of phone ownership

Thinking about users when the mobile is the only phone

- Consider patterns of mobile use across broader spectrum:
  - No access
  - Shared access (payphones)
  - Mobile ownership
  - Mobile + landline ownership
- Consider benefits of "mobility" and "display" verses **basic connectivity**
- Place mobile behaviors in communication repertoire with landlines, PC/Internet, transport
- Use chance to re-examine general role of telephony in society

Next Steps: Research Agenda

- **Improve impact measures**
- **Deepen analysis of network effects**
- **Space/place (local vs long distance behaviors)**
- **Extend analysis to include full communication repertoires**
  - Within mobile use (beep, text, call, etc)
  - Across platforms (face to face, public internet, private mobile, etc)