Dynamic Networks of Mobile Money among

Unbanked Women in Western Kenya

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## Project Abstract

This project set out to examine how 20 unbanked women of diverse backgrounds use different kinds of mobile money social/financial tools over the course of one year. We used ethnographic fieldwork and quantitative social network analysis (SNA) to measure how women in Western Kenya were using digital financial tools and social networks. How are digital financial tools used as a part of women's' social /financial networks? Adapting the financial diary method, we visited women every two weeks and recorded how they used digital financial tools such as digital credit and M-Pesa; how they used cash, either for payments, for keeping in a secret place, or for gift-giving; and how women used in-kind value such as food, clothing and plants as gifts and exchanges. The study sought to understand how women's use of digital financial services fits in to existing social networks and financial networks that include digital finance, cash money, mobile money transfer, and other media of exchange (Zelizer, 2000).

## Introduction

Kenya has been called the epicenter of the mobile money revolution. Here more than 80% of rural households use mobile money transfer (McKay & Kaffenberger, 2013). With money transfer, women in Western Kenya create networks of friends, relatives, church members, co-workers, and savings groups (SGs), often pooling contributions with siblings or others for specific purposes.

## Project Activities

Previously we (Kusimba, Chaggar, Gross, & Kunyu, 2013) used a network approach to examine how mobile money remittances are sent and circulated to friends and family. We drew network graphs for 14 families documenting the importance of siblings and mothers in sending and receiving money. However, the graphs did not incorporate time. We did not ask people how much money they sent to others, and therefore did not deal with the economic dimension of money.

We wanted to address these missing dimensions in the current study, and to show the network in motion by drawing the social network over time. An individual might have a more stable network, or a network that changes over time. Our inspiration in terms of method was the financial diary. Creating a financial diary involves returning to households at intervals to collect data and using questionnaires and observations to record household cash flows, money sources, spending and savings patterns, and financial instruments used.

## Households, Networks, Hearthholds

Research methods and designs are a vital part of the formulation of financial products. They are "integral to the process through which finance flows into the global South – under the rubrics of development aid and market investment alike. Research artifacts, as such, have become internal to, rather than an outside eye on, survival practices of the poor—and the not so poor as well (Elyachar 2006:413)."

Financial diaries are a commonly used research method. They are based on household economics surveys which collect financial information about households every two weeks or so over a period of about one year including household income and expenditures (Collins, Morduch, Rutherford, & Ruthven, 2009; Roy, 2012). Household diaries often seek data on people's and especially women's finances in order to develop strategies or products that that can be used to build savings, support a small business, or fund household consumption especially for lumpy items. Financial diaries use short-term data on household income and expenditures, sometimes also including in-kind assets and social gifting, to quantify appropriate loan and credit terms for providers (Anderson & Ahmed, 2016; Rutherford, 2016). They seek to be fine-grained and often use vignettes of daily life to provide an ethnographic sense of "the financial lives of the poor (FSD Kenya 2014)." See IMTFI's Consumer Finance Research Methods Handbook for more information (http://www.imtfi.uci.edu/files/consumer_finance_research_methods_project/IMTFI%20Consumer%20Finance%20Research%20Methods%20Toolkit_beta%20version_Reduced%20size.pdf).

Over time household economics has moved through various theoretical models that attempt to understand the relationship of individual decision making to the economic performance of the household as a whole. In some models the household is treated as an integrated economic unit while in others, researchers may collect field data to see individual economic and social behaviors within a unit in order to understand how household members experience cooperation and conflict with each other (Kabeer, 1994). Of late, household economics has worked to identify individuals and gender through studies of household bargaining power and intra- and inter- household exchanges (Agarwal, 1997). Per this view, restrictive gender norms impede women from bargaining successfully with husbands for control over funds. “Decision-making within the household is thus seen as the resolution of potentially conflicting preferences through a process of negotiation among unequals (Kabeer 1994:109).” Recent studies showing that microfinance often ends up benefiting a man’s business rather than his wife’s (DeMel, McKenzie, & Woodruff, 2009) are interpreted as evidence of restrictive gender norms.

The Kenya Financial Diaries, a million-dollar project funded by USAID, the Gates Foundation, and UKAID, tracked income and expenditures of 300 Kenyan households every two weeks for a year as well as more than 700 individual members of these households (FSD Kenya 2014). This study was the first to include households which regularly use digital money transfer. The study revealed just how much households participate in flows of resources with other households. The importance of social networks and inter-household exchanges in sub-Saharan Africa is well-known to anthropologists, for whom the mobility and flexibility of people in social groups is “an underlying fact of life" that makes the assumption that households are independent or even meaningful economic units "inaccurate (Guyer 1981:98)." If anything, M-Pesa has amplified the social networks that interweb households (Kusimba, Yang, & Chawla, 2015). Financial diary households may be convenient sampling locations – but they may underestimate inter-household exchanges – which after all is what the M-Pesa money transfer service mostly enables.

Social networks have functions that are social as well as economic and may deplete rather than contribute to short-term household income. In this way the financial diary method may tell us what kinds of economic behaviors build value in the households, but they might not illuminate the intended purposes and the logics behind the use of many financial services such as M-Pesa. For example the Kenya Financial Diaries Study views the circulation of funds in social networks as inefficient: it sees "flaws in the social network": the social network is too slow, collects insufficient funds, or collects a lot of money for irrational purposes, such as for funerals instead of medical care to save a life (FSD Kenya 2014).

Understanding how digital finance moves and creates its own groups means departing from a household framework and following the social networks that are produced by the money transfer and other digital financial services, cash money exchanges, in kind exchanges, and so on. Money transfer, like the mobile communication of which it is a part, creates social networks. People participate in diverse financial circuits with kin, friends, savings group members, community members, and financial providers. These networks may be based on friends, relatives, savings groups, and other relationships. Money sending networks circulate small amounts of money through frequent transfers for everyday needs. Most Kenyans participate in numerous networks; family networks shaped by money transfers are reciprocal and often involve siblings, cousins, mothers and mother's kin. Women can be central nodes with many connections or act as bridges between different groups – these women who are hubs are mothers, grandmothers, school headmistresses, and so on (Kusimba, Yang, & Chawla, 2016).

Transfers involve not just sender-receiver transfers but impromptu fundraising. A varying number of people will be called and asked to contribute for needs within the social network, ranging from everyday consumer items to medical needs, schooling, documents, rituals (especially funerals), and so on. Indeed, this informal fundraising is so common that much of M-Pesa traffic seems to involve pitching in toward some portion of a need along with a few other people. In other words, most sender-receiver transfers are a part of group behaviors, actions and plans.

## Methodology

This project collected financial diary data for 8 women to create a diary that was updated every two weeks, and that included use of mobile money, digital credit, cash exchanges, in-kind transfers, and household income and expenditures. Although we began initially with 20 women, we were unable to maintain context every two weeks with all these women. We focused on the social network of the research participants and how it changes over time. This allowed us to examine the changing social role of a woman in her network. We are including not just cash money, but mobile money and in-kind gifts and transfers in the network.

**Study Results, Outcomes**

Our project sustained recording every two weeks with a total of 8 women from January 2016 to the end of July 2016. In other words, we were unable to complete a full year-long diary exercise with all the original participants, which at the beginning of the exercise included 20 participants. Twelve participants dropped out or were difficult to find for several weeks in a row, at which point Kunyu could not continue to record diary information. Visiting the women involved a fair amount of traveling and discipline. Most of the time, women were not home and Kunyu's time was often taken up with visits to households that were empty. The study could probably have continued for the full year if a larger amount of research funds had been available, as Kunyu often made several unproductive visits per week to households, for which I felt his time needed to be compensated. One outcome of our study was an appreciation for just how time consuming and expensive the financial diary exercise actually is. In order to complete this project as conceived, a significantly larger budget—enough to support Kunyu with at least two other field assistants—would have been ideal. Nevertheless, it is important to note that published financial diaries often deal with missing data. In the Kenya Financial Diaries, for example, the average number of months an individual was observed was 7.9 out of 11. Only 391 out of 782 – exactly half – of individuals in the survey produced the full year of data (Kenya Financial Diaries 2014).

We created dynamic maps - setting the network in motion - for eight women from Western Kenya, depicting her at the center of an ego network connected to diverse alters, including social/financial instruments, friends connected through money transfer; savings groups, M-Shwari loans, banks and MFIs; and secret savings places to store money. These maps also incorporated household income and household expenditures on food, farming, income generation, and health and school fees. We visited women once a week for 22 weeks and recorded incoming and outgoing money amounts to and from these alters. Finally, a series of histograms depict the outgoing and incoming money balance, and the number of connections each woman had per week.

I will use one participant's diary data as an example of the project methodology and results.

### Case study: Praxides

Praxides is a 29-year-old farmer with a diploma in library science. She gains income from retail trading in basic household goods at a kiosk, selling vegetables, and trading in ripe bananas. She currently assists at a private primary school in the neighborhood and sells firewood. She also bakes bricks, farms kales, and keeps a flock of sheep. Praxides lives with her mother and her own children. Both her husband and father work elsewhere. Like many Kenyans her main M-Pesa connections are to siblings with whom she circulates frequent small transfers. Praxides receives 2000 shillings (US $20) monthly from her brother for the family – she is considered responsible and she is the only person with a phone in her household. Her father also lives elsewhere and assists her occasionally.

The diary presentation showed some very interesting results around Praxides' use of money during the study period. First, Praxides is an active user of M-Pesa, which she uses to send and receive money from friends and relatives, especially her brother David. She spends significant sums on transportation and firewood, and in fact does not recoup her spending. She also has taken large loans from M-Shwari, only a portion of which has been repaid.

**Table 1:** Praxides' Summary Diary Data – Average weekly figures over 22 weeks

| | |
|---|---|
| Average Spending on food | 290 |
| Average Spending on transportation | 270 |
| Average spending on her firewood business | 850 |
| Average spending on assistance to friends with M-Pesa | 238 |
| Weekly expenditure on airtime | 85 |
| Weekly gain from the firewood business | 430 |
| Weekly assistance from friend /relative in cash | 87 |
| Weekly assistance from friend /relative M-Pesa (brother David) | 300 |
| Average weekly payment to M-Shwari loan: | 98 |
| Total borrowing in 22 weeks from M-Shwari: | 16700 |
| Average weekly borrowing from M-Shwari: | 795 |
| total repayment in 22 weeks to M-Shwari: | 4375 |
| Total contribution to savings groups: | 6600 |
| Total wins from savings groups: | 4600 |

Praxides uses M-Shwari service for savings and as an easy medium through which she obtains quick loans. Her borrowing and repayment fund her firewood selling business, giving her money for transport and purchase of logs, which she then splits and sells in her neighborhood. She also borrows for emergencies like illness or to help stranded friends with transport. She has increased her credit limit to 7500 shillings (US $75) from 2000 shillings (US $20) through careful repayment.

This video about Praxides shows how the dynamic network changes over time: (http://www.imtfi.uci.edu/files/docs/2017/Praxides%20Presentation.mp4). Please click the link to show the presentation as it moves through the drawings made of each week. The very last slide shows a histogram summarizing and comparing money amounts Praxides receives from all her sources compared to money amounts she expends on all her needs, and shows that she is mostly operating with a negative balance. She is often in a position of owing, whether to people in her social network, to a shopkeeper or to M-Shwari digital credit.

M-Shwari loans must be repaid in time to avoid blacklisting – being shut out of the service for failure to repay. While Praxides told us she used digital credit for her firewood business, M-Shwari transactions were consistently intertwined with her other financial instruments during the period of the diary exercise. She borrowed from M-Shwari to assist friends and relatives with medical and school fee emergencies and then strategized repayment through friends, her savings group, or through an M-Pesa agent. Once she asked this agent to deposit 4000 shillings in her account so she could pay this amount to M-Shwari. After she repaid the 4000 from the M-Pesa agent's loan, she borrowed 4500 from M-Shwari again to pay the agent back. She now owed M-Shwari 4500 after paying back the agent 4000 but had another 30 days to repay. Praxides mostly pays M-Shwari back in small bits; she becomes conscious of time to repayment; a closer deadline forces her to pay in larger amounts. She is integrating M-Shwari into her social/financial networks.

Table 1 above underscores that Praxides' use of M-Shwari includes much more borrowing than repayment. While the time period of our study was too short to really determine the economic value and impact of the M-Shwari product, the limited study indicates that the digital credit product becomes incorporated into a social network that includes friends and relatives and is in constant circulation. Furthermore, Praxides' struggles to repay may be driving cycles of repayment followed by borrowing and juggling across the social network. The work of Carolyn Schuster (Schuster, 2015) has examined this kind of "bicycling" in women's cycles of payment and borrowing in Paraguay that are a worrisome parallel to Praxides' experiences. Her story also fits into mounting concerns about indebtedness surrounding the popularity of digital credit in Kenya. A recent report found that indebtedness and blacklisting were becoming common in Kenya, where more than 20 providers now offer short-term loans over the mobile phone. The impact of the M-Shwari service needs to be examined with a longer study.

A dynamic network perspective can reveal how women's use of DFS (Digital Financial Services) plays out and integrates into the rest of her social network. In the final histogram, Praxides' overall negative money balance can be compared to her social connections – which remain at 5-9 connections each week during the study period. Praxides maintains her network of support through reciprocal exchanges, sometimes using the M-Shwari service to help a friend, and retain her social capital in her network. M-Shwari is marketed as an economic tool, a source of credit for income generating activities and small businesses, which is what Praxides told us she uses the product for; in reality she uses it, like the other media in her network, to produce social relationships.

## Conclusion

To summarize, this study sought to modify the financial diary approach to understand and depict the changing social networks of women who incorporated digital financial services into a social/financial network of diverse alters and formed with diverse media of exchange. While we were unable to complete a diary exercise of the size and scope that we intended, we did show how the financial diary method can be modified to depict a dynamic network centered not on a household, but on an individual user.  Household economics is often unsure about when to measure the economics of "households" in aggregate, and when to measure the economic activities of individuals separately.  This question still remains open. But when inter-household ties are important – such as with the study of the use of digital finance – this project demonstrates that dynamic networks are a methodology that shows promise.

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