Hearthholds of mobile money in western Kenya

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Kenyans use mobile money services to transfer money to friends and relatives via mobile phone text messaging. Kenya's M-Pesa is one of the most successful examples of digital money for financial inclusion. This article uses social network analysis and ethnographic information to examine ties to and through women in 12 mobile money transfer networks of kin, drawn from field data collected in 2012, 2013, and 2014. The social networks are based on reciprocal and dense ties among siblings and parents, especially mothers. Men participate equally in social networks, but as brothers and mother's brothers more often than as fathers. The matrilineal ties of mobile money circulate value within the hearthhold (Ekejiuba 2005) of women, their children, and others connected to them. Using remittances, families negotiate investments in household farming or work, education, and migration. Money sending supports the diverse economic strategies, flexible kinship ties, and mobility of hearthholds. Gifts of e-money are said to express a natural love and caring among mothers and siblings and are often private and personal. Consequently, the money circulations of the hearthhold avoid disrupting widely shared ideals of patrilineal solidarity and household autonomy.

Keywords Mobile Money; Mobile Phones; Kenya; Africa; Kinship; Women

Using mobile money, people send money to friends and relatives via mobile phone text messaging. The service allows people to store money and send small amounts relatively cheaply, without need of an Internet connection or bank account (Taylor and Horst 2013; Kendall et al. 2011; Maurer 2012). Mobile money has proved remarkably popular in Kenya since its 2007 debut; more than 80 percent of Kenyan rural households use it (McKay and Kaffenberger 2013). Many hope that a system based on digital money transfer will create a new cash-light future and bring financial inclusion - access to financial and banking services - to the poor through mobile phones.

What kinds of social relationships do women produce using mobile money? I use social network analysis (SNA) and ethnographic data collected in 2012-14 in rural western Kenya to examine 12 family networks of mobile money transfer. Family networks of mobile money are based mostly around sibling, mother, and cousin ties. Women are often central nodes in these networks, having more connections to other nodes and more connections to well-connected nodes. Mothers and grandmothers can broker resources across groups of siblings.

The flows of mobile money frequently circulate within the hearthhold (Ekejiuba 2005), a set of siblings, their mother, and others connected to them. Ties to and through women, both old and young, are important pathways for digital value. Men participate equally in mobile money networks, but are more often brothers and mother's brothers than fathers. In some families, men send money to women, whereas in others, women and men are equally senders and receivers. As aspirations shift toward middle-class identity, urban tastes, and household autonomy, people now combine diverse economic strategies with individual mobility and flexible kinship ties. But for most, success still depends on accessing shared extended family resources, often through a husband, brother, or father. Furthermore, the patrilineal ideal is still celebrated at public rituals organized by elders, such as funerals, weddings, and coming-of-age ceremonies.

The matrilineal ties of mobile money are a means of shoring up the hearthhold through small but frequent remittances, which support the production of family farms, education, medical care, and consumption. Women gain prestige from apportioning money to such needs. Nevertheless, money gifts also give women increased burden and social pressure to recirculate e-money gifts.

Mobile money sending is said to express the presumed natural basis of love and caring between mothers and children and is often achieved through private and personal use of mobile phone communication. As such, these intimate and private investments in the hearthhold avoid threatening widely held ideals of patrilineal solidarity. Nevertheless, mobile money is far more than a money of the domestic sphere; rather, it sustains and invests in people and relationships and connects them to new circulations of money that are flexible and dispersed.

Mobile money in Kenya

Digital money and mobile phone money have come to much of the Global South in recent decades. Initiatives to help the unbanked use savings, credit, insurance, and payment technologies "give hope for a more inclusive, fair, and equitable economic globalization" (Singh 2013:7). Kenya is a widely regarded but somewhat exceptional success story for digital money and its benefits to citizens and consumers in developing settings (Kendall et al. 2011; Maurer 2012).

Safaricom's M-Pesa service was introduced in 2007 in Kenya with the urban to rural remittance market in mind (Morawczynski 2009). In the company's Send Money Home advertisement, an urban worker in suit and tie sends Ksh 1,000 (US$12) to his grateful rural parents. By 2014, there were more mobile money accounts than adults in Kenya (McKay and Mazer 2014), and Safaricom had become East Africa's most profitable company. Development foundations, governments, and the private sector hope to develop e-money beyond remittances into a financial ecosystem of payments, savings, and microcredit that could become the developing world's first "cash-light" economy (Mas and Radcliffe 2011; Mas 2013).

It is also hoped that individuals, particularly women, will use mobile phones to access value and achieve empowerment (GSMA 2012; Maurer 2012). The Gates Foundation's recent Women and Girls Initiative sought ways to help women save a digital balance on the mobile money account and use it to support their households and entrepreneurial activities (Gates Foundation 2015).

Survey and ethnographic data bear out that digital money transfer services are very frequently used by women. Early research showed that many remittances passed from husbands working in Nairobi to their rural wives in Central Kenya (Stuart and Cohen 2011). Low-income

Kenyan women in other areas also receive significantly more digital money in remittances than men (Financial Sector Deepening 2014; Johnson 2012, 2014; Wandibba et al. 2013; Singh 2013) and use the mobile channel in their savings groups (Johnson 2012, 2014; Rasmussen 2011; Kiiti and Mutinda 2011). Among ethnic Somalis in Kenya, M-Pesa is used by women even as their husbands use the centuries-old Hawala service, usually for less frequent sending of larger amounts of money (Iazzolino 2014).

Social networks as snapshots of social relationships

Mobile phones are a means of creating relationships-shaping direct personal ties with others (Ling and Campbell 2010). Like mobile phone use, the money transfer service can profitably be seen as a form of communication itself (Taylor and Horst 2013). Digital money transfer is an adjunct to the mobile phone talk through which people create common lives over time, sharing their troubles, aspirations, and plans. Through the mobile phone as a tool of emotional, social, and economic connection and exclusion, then, digital gifts create social relationships.

The social relationships of money sending create networked ties, linking up individuals. These networks of ties create a kind of social organization or structure of relationships: "Human beings are connected by a complex network of social relations. I use the term social structure to denote this network of actually existing relations" (Radcliffe-Brown 1952a:190). To render this networked but somewhat rigid view of social structure as changeable over time, one can see a social network as "a snapshot of a social system . . . . The operation of a system might be described as a series of such snapshots" (Foster and Seidman 1981:329). The money-sending networks of kin I present here are snapshots of changing economic and social relations among family members that reflect cultural ideas about personhood, age, seniority, gender, social class, and marriage (Collier and Yanagisako 1987).

By examining social networks of mobile money gifts as snapshots of social relationships, this study sought to understand the roles of women in digital money transfer networks with reference to the historic and ethnographic context. What kinds of kinship ties do women form, and with whom? What historical contexts, norms, and ideas inform the kinship ties of mobile money?

Geographic and cultural background

Bungoma and Trans-Nzoia Counties, where this research was carried out, is the home of include Bantu and Nilotic speakers. Most of our participants were from the Bukusu ethnic group (Wagner 1975; Makila 1978; Were 1967). During British colonial rule, much land was appropriated for European use, leading to widespread migration and resettlement (Maxon 2003; Wandibba 1985). Western Kenya's people are still predominantly rural peasant farmers. In a 2009 census, 93 percent of Bungoma County households had land under cultivation, which was the primary source of income for 58 percent of all households. More than half of households owned a mobile phone (Government of Kenya 2009); 70 percent of households earned less than Ksh 5,000 (US$60) per month (Kusimba and Wilson 2007).

Methods

In 2012-2014, a research team (Kusimba et al. 2013) created social network drawings for 12 families. A social network consists of a set of nodes, in this case, individuals, and the ties between them, in this case, flows of mobile money transactions (Wasserman and Faust 1994). SNA provides a visual display of money transfer pathways; furthermore, SNA statistics can tell us which individuals are most important in structuring the network, how many ties connect individuals, and whether ties are reciprocal or unidirectional (Wasserman and Faust 1994; Newman 2010; Prell 2011). We asked participants for the names and relationships of relatives to whom they had sent money over the past year. Named relatives were contacted and their money-sending ties recorded. This process was continued until no further named contacts could be located. The families range in size from 8 to 70 persons. Our SNA method was supplemented with ethnographic interviews with more than 50 persons and survey data with 100 persons who are members of the social networks.

The families' diverse members include farmers, small-scale business owners, young people pursuing education or employment, and wage-earning teachers, doctors, dentists, and civil servants. Members live in Bungoma and Kimilili towns; rural areas in Bungoma County, such as the rural hamlet ofNaitiri village; and cities such as Nairobi, Kitale, and Kisumu. Six of the families include international migrants to the United States, Great Britain, and the Netherlands.

Two families are drawn in Figures 1 and 2. The other 10 are published elsewhere (Kusimba et al. 2015b:16-21). In the networks drawn, individuals named or interviewed, or both, appear as nodes, with women being circles and men being triangles. The arrows connecting them indicate directions of mobile money sending. Bidirectional arrows indicate that two people send money to each other. Common colors denote siblings; thick margins denote a senior generation (grandparents), medium margins their children, and thin margins their grandchildren. Larger nodes are central - they have more ties to other nodes or to other well-connected nodes (Brin and Page 1998).

Remittances: Uses and networks

Money sending in these families involves relatively small, frequent remittances. Forty-seven people in Kimilili in 2012 reported 155 remittances in the previous month, or approximately 3 per person, with an average size of Ksh 1,800 (then about US$20); in rural Naitiri, 25 people reported 37 remittances, with an average value of 700 Ksh (US$9). The purpose of these remittances was for food, medical care, and school fees; to respond to health and transport emergencies; and to contribute to rituals of personhood, relationships, and the life cycle, such as funerals and coming-of-age rituals (Kusimba et al. 2013).

Remittances are aimed at "making people in their physical, social, spiritual, affective and intellectual dimensions" (Narotzky and Besnier 2014:S4). Many remittances are sent in response to crises and emergencies-children sent home from school for lack of fees, health crises, or a family member stranded without transport or needing transport to pursue the possibility of a job. Families often set up cyclical contributions via mobile intended for school fees, a funeral fund, medical care, seasonal support for the family farm, or maintenance of rural housing to avoid the sudden experience of crisis. Debate and coordination shape these joint decisions that create channels of support. Such family decisions about the use of money remittances are fundamental

to economies and to living: They create "structures of provisioning, investments in social relations, and relations of trust and care" (Narotzky and Besnier 2014:S4).

Money transfer pathways "send money home" from an urban to rural setting but also go far beyond this scenario. Money sending, sharing, and pooling occurs in a variety of social groups, including savings groups, groups of friends, community fund-raising, and extended family groups. The urban sender- rural receiver dynamic is often just one part oflarger networks of mobile money transfer that extend across rural areas; connect urban, peri-urban, and rural households; and reach international migrants (Kusimba et al. 2013).

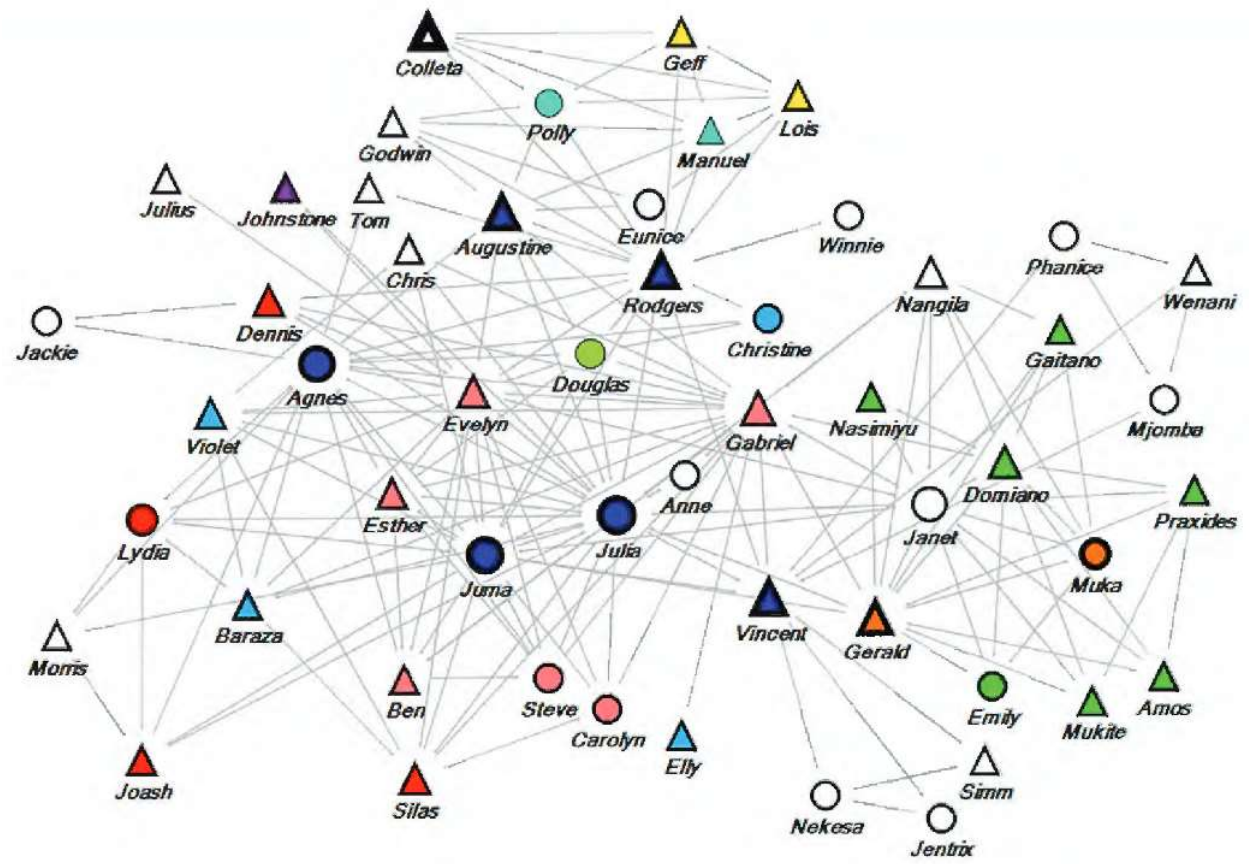

Figure 1 Julia Family. Julia, Juma, Agnes, Vincent, Rodgers, and Augustine are siblings. Julia is a widowed farmer; her deceased polygynous husband recognized another family, including his son Johnstone, as rightful heir of the family plot of land. Julia lives on less than an acre, which she purchased gradually through selling her own farm produce. She, her siblings, and her children Gabriel, Evelyn, Esther, Ben, and Carolyn share many connections to one another and to the children of Julia's siblings. Julia does not have a phone but borrows one from her children or her siblings. Gerald is the brother of Julia's deceased husband, and his wife, Janet, and children are connected to the central group through a smaller number of ties. Augustine, Rodgers, and Vincent send and receive from both their wives and child ren on the perimeter of the network drawing and from their siblings in the center of the network drawing. In-laws and friends are in white.

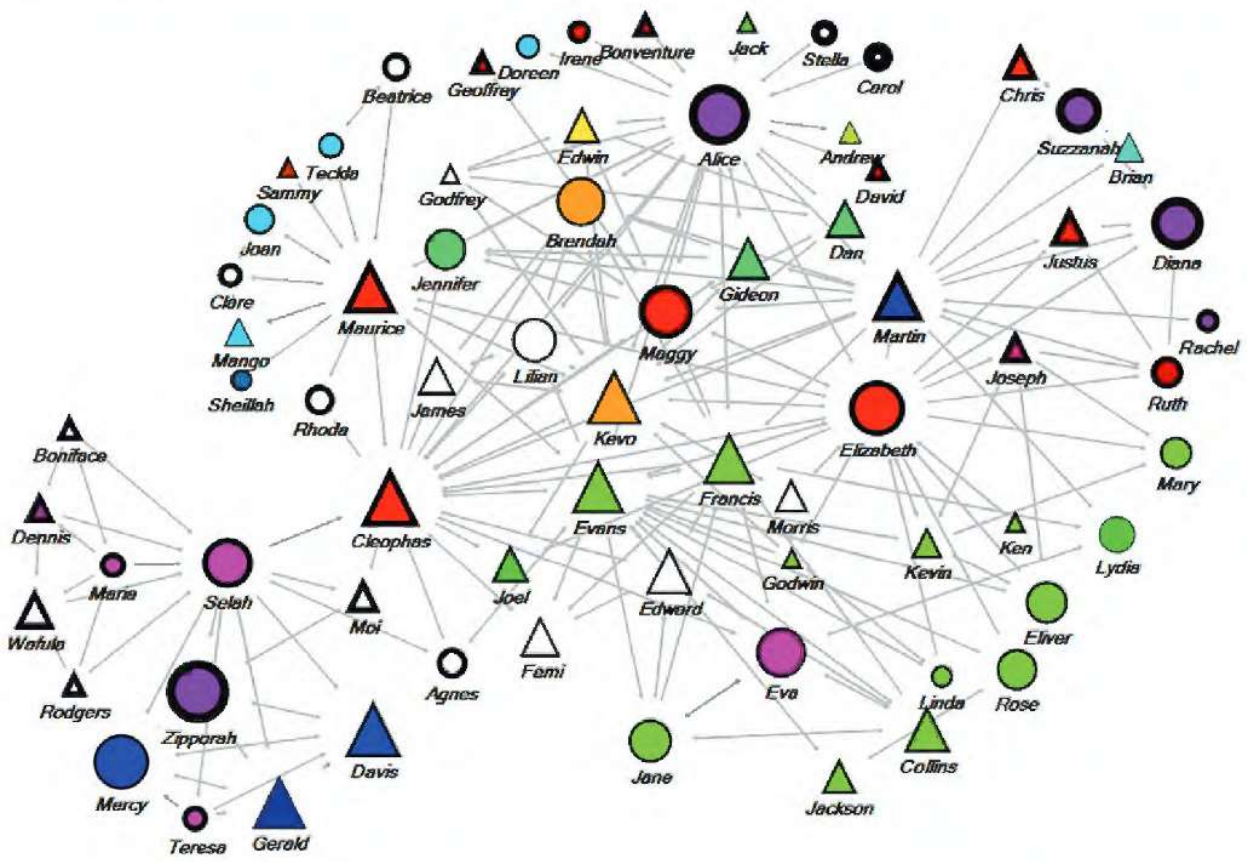

Figure 2 Cleophas Family. This sociogram is centered around Alice, a 73-year-old grandmother, and her cowives, Suzzanah, Diana, Rachel, and Zipporah (all in purple), who live approximately 20 kilometers south of Bungoma. Her deceased husband had several other wives. Alice's children are in red, and her grandchildren (thin borders) are in green, orange, light blue, and yellow. Zipporah's children are in light purple and blue. In-laws and friends are in white.

Patterns in the networks

All 12 families were dominated by reciprocal ties, meaning that senders are also receivers (Kusimba et al. 2015b). Urban and international migrants send money into a circulating pool of resources. The networks are made up of individual money transfers but also reflect informal financial practices like money pooling and fund-raising for specific needs such as school fees or medical care. In the networks, each individual is connected to, on average, five other persons, indicating relatively dense connections of support. The networks are characterized by (1) dense ties among siblings; (2) the centrality of women's nodes, particularly mothers; and (3) the equal participation of men, who are more often brothers and mother's brothers than fathers.

Ties among siblings

All 12 networks are dominated by sets of siblings, who are identified by similar color on the sociograms. These sets of siblings are often connected to other sets of siblings by ties of descent or marriage, making sibling ties and cousin ties the most common ties in the networks. In the largest family, Cleophas's (Figure 2), the most common ties are among the children of siblings, followed by sibling ties (Table 1).

Table 1 Kin Relationships of Recipients to Senders in Cleophas's Social Network Graph (Figure 2)

Relationship of Recipient to Sender	Number of Ties in Social Network Graph
Cousin	39
Brother	30
Nephew	22
Sister	22
Mother	16
Son	14
Daughter	13
Niece	9
Other	93
Total ties	258

Centrality of women

Central individuals (larger nodes) have more connections to better-connected nodes. Individuals of varying age and gender may become central in their networks. Central men are often older brothers and sons who make connections to half-siblings, such as in Cleophas's family (Figure 2). Central women may be the youngest, the middle, or the oldest generation in networks. Mothers are often central and have many ties (Kusimba et al. 2015b). Central individuals amass and sometimes recirculate assistance from many other members.

Brokerage

Besides centrality, another position usually considered advantageous in social networks is brokerage (Stovel and Shaw 2012). A broker is a unique tie between two sets of networked nodes who presumably can control the flow of resources from one part of a network to another. Ethnographic evidence found brokerage among three families with grandmothers. One is Dorcas in Family 10 (Kusimba et al. 20 l Sb), who assists her deceased sister's children using remittances from her children, two of whom live in the United States. In another example, Lucida is a 47-year-old nun and student in Chicago who sends about US$300 a month to her mother in Homa Bay County, western Kenya. After her father died, Lucida's mother became vulnerable among her in-laws, who chased her away from her home and stole her dishes and home furnishings. The migrant in Chicago and her siblings built and furnished her a new home on land they purchased that is the envy of the village. Lucida sends her money for "upkeep" and is aware that the money ends up helping others in the family as her mother sees fit.

Brothers and mother's brothers

Most of the 12 networks include equal numbers of men and women. Men are most often brothers and mother's brothers, more rarely husbands and fathers. In some networks, polygynous fathers connect to two wives and children. The importance of mother's brothers is equally true in smaller and larger networks such as Julia's (Figure 1) and Cleophas's (Figure 2), where fathers are much rarer ties than brothers and mother's brothers (Tables 1 & 2).

Table 2 Relationship of Male and Female Recipients to Senders in Julia's Family (Figure 1)

Women		Men	
Recipient	**Number of Ties**	**Recipient**	**Number of Ties**
Brother	17	Cousin	22
Son	12	Brother	16
Cousin	9	Sister	13
Mother	8	Maternal aunt	9
Nephew	7	Nephew	8
Daughter	6	Wife	8
Brother-in-law	5	Maternal uncle	7
Maternal aunt	5	Mother	7
Sister	5	Niece	6
Husband	4	Sister-in-law	4
Niece	4	Brother-in-law	3
Maternal uncle	4	Daughter	3
Half brother	3	Paternal cousin	3
In-law	3	Son	3
Father	2	Father	2
Other	21	Other	13
Total male recipients	115	Total female recipients	127

The hearthhold: The ties of mobile money

The anthropology of kinship has examined the diverse role of female kin cross-culturally. Closer family ties to or among female kin, as compared to male kin, has been variously termed matrilateral asymmetry, matricentered kinship, gynefocality, gynocentricity, matrifocality, matrilateral bias, or woman-centered kin networks (for a review, see Yanagisako 1977). Such terms encompass a range of ideas and relationships about women, including co-residence, mutual aid, intensity or duration of emotional bonds, the primacy of the mother - child relationship, or the authority of mothers in households. A variety of women-centered kin networks have developed in urban settings, in particular to connect autonomous households through everyday ties of support; but they are shaped by specific social histories (Yanagisako 1977).

In the case of western Kenya, mobile money circulations among siblings and mothers are similarly locally and historically situated. In the early twentieth century, patrilineal social relationships were strongly expressed in this part of East Africa; the solidarity of corporate groups based on father - son ties were sustained over time through bridewealth exchange and patrilineal inheritance of land (Wagner 1975; Makila 1978). Among the Luyia, ceremonies such as funerals and circumcisions revitalized the solidarity of the patrilineal corporate group. Negotiating exchanges of bridewealth cattle during these rituals was an important source of male elders' authority (Mutongi 2007:64; Wagner 1975). A woman's use rights were usually to the land of her husband and his family; polygyny was common, and half-siblings shared several "mothers" and were brought together by rights of residency, inheritance, and seniority (Wagner 1975).

Even patrilineal society expressed and institutionalized ties to and through mothers to some extent. A bride who moved to her husband's community created social relationships through friendship, through her children, and through preservation of ties to her siblings, particularly her brothers. A wife stewarded her husband's plots for her own sons' inheritance, a system called the house-property complex (Nasimiyu 1997). A woman consequently had some degree of control over her children's interests and could often bring her own kinship ties to bear on behalf of her children. In such societies, "a woman who maintained ties with influential brothers, and who astutely played off her husband against them, must have been able to provide her sons with many advantages not available to youths with less astute mothers" (Collier 1988: 126; see also Wolf 1972). The mother's brother in sub-Saharan Africa was sometimes called "male mother"; Radcliffe-Brown (1952b:20) noted the "tenderness and indulgence" mother's brothers expressed to sister's sons through everyday closeness and ritual gifts.

The hearthhold

Urban migration, modernity, wage labor, employment for women and men, and economic diversification have brought dramatic family change. Western Kenya's households combine subsistence agriculture with numerous other sources of income- cash cropping, wage labor, trading, craft production, and receipt of remittances (Bryceson 2002; Wandibba 1997; Nasimiyu 1997). Men and women seek economic security in multiple economic pursuits and projects. The dependence of youths and women on patriarchs has lessened as rates of single motherhood in Kenya are some of the world's highest (Clark and Hamplova 2013; Kilbride et al. 2000; Munyua 2009; Mutongi 2007; Wandibba 1997). Today prestige and its attendant responsibilities to carry others can come not just from gender or age but from employment, education, assets, and urban or international migration (Meagher 2010; Kusimba et al. 2013). Christianity has brought the ideal of a father-headed, nuclear household to Western Kenya despite the persistence of polygynous marriage and secret or contested polygyny (Kilbride et al. 2000).

Finally, in recent decades, East African families have become increasingly economically opportunistic, residentially dispersed, and mobile (Bryceson 2002; Vaughan 2005). An explicitly middle-class, urban identity has become an ideal even in rural areas where most can only aspire to full wage employment (Green 2015). Such an ideal may be expressed in new habits like shopping at supermarkets (Green 2015) and is pursued through entrepreneurial projects with rural assets, which the people of western Kenya call "investments." These investments include building rental housing or pursuing farming or husbandry for profit, with such enterprises often co-managed by urban and rural kin.

One 47-year-old father described an investment as "a gift that keeps on giving ... land and healthy animals, or a rental house, where it gives me something every month" (Kusimba et al. 2013:36). A successful dentist in Kimilili town was determined to develop farmland he inherited from his father. He explained, "With a real investment ... you will never be poor" (36). Wage labor is primarily pursued as a means of accumulating capital to make these gift-giving investments possible. Urban migrants build visible signs of their status; it is considered honorable to refurbish a parent's rural home and necessary to build one's own, which will be visited at holidays. The "gifts that keep on giving" have become an economic and social goal.

Mobile money ties of the hearthhold

In a context of rapid social change, then, the hearthhold, based around a woman, her relatives, and her children (Ekejiuba 2005), is becoming a basis for lifelong bonds of support. Through hearthholds, women and men create ties to their siblings and their mother's families (Lindell 2010; Meagher 2005; Nasimiyu 1997; Ekejiuba 2005). The 12 family networks of mobile money reflect the diversity of support ties Kenyan families produce today. Some sibling networks connect to both a mother and a father, some to a polygynous father and half-siblings; some are based around siblings with ties to children and in-laws; and others exclusively tie to co-wives and half-siblings. Networks reach across a variety of geographic scales: All incorporate money sending from urban wage earners in nearby towns or urban centers, such as Nairobi and Mombasa; some incorporate international remitters. Geographically dispersed hearthholds are connected by mobile money ties.

Women are not more common than men in these networks. Rather, the networks reveal the relationships of the house-property complex, and they embrace siblings and ties to mothers' kin, particularly mother's siblings and mother's brothers. They also recall the concept of the uterine family: the ties to and through mothers in a patrilineal society (Wolf 1972). In East Africa, sibling relationships derive from shared experiences in childhood, relationships of fostering and caregiving based on seniority, and exchange and mutual assistance throughout the life course, extending to siblings' children (Lijembe et al. 1967; Wagner 1975). Both men and women use mobile money to exchange resources with the homes of their birth and through their mothers to mother's kin.

Mobile money circulations in the hearthhold can rely on social relationships described in early ethnographies (Wagner 1975). Often siblings pool resources for specific tasks, sending the money to the phone of the oldest son-called the simakulu among the Bukusu. A SO-year-old shop owner and farmer collected his younger siblings' contributions to build his father a house, citing the gifts on his mobile money account and proudly displaying his phone to me as the site where all the donations were collected: "It's all in here," he beamed. Money transfer networks also build on and around the brother - sister bond and the closeness and affection among mother's brothers for sister's children (Radcliffe-Brown 1952b; see Tables 2 & 3). Gabriel, Julia's son (Figure 1), explained, "I see my [patrilineal relatives] at funerals . . . those who have helped me with fees and other investments in my future have been my [maternal] uncles .... My maternal uncles have been more meaningful to me."

Table 3 Z-Scores Comparing Gender of Ties in Families 1 and 2 to Identical Networks with Nodes of Randomized Gender

		Z-Scores	
Tie	**Cleophas's Family**		**Julia's Family**
Male-male	0.177		-0.592
Female-female	-0.844		0.539
Male-female	2.460**		0.536
Female-male	-0.924		-0.008

Note: In Cleophas's network, men are significantly overrepresented as money senders.

Many families pool significant resources for school fees, which are sometimes also described as investments. The new economy of middle-class identity is out of reach for many rural people (Green 2015) but seems to be inspiring savings groups who save collectively for schooling, land, a minibus, or rental houses (Kusimba et al. 2013). Mobile money and mobile phones circulate and transform money, opening possibilities among dispersed family and social groups (Kiiti and Mutinda 2011; Ledgerwood and Jethani 2013).

Gender in money sending and receiving

Gender affects money sending differently in different families, a comparison best illustrated with the largest families, Julia's (Figure 1) and Cleophas's (Figure 2). In Cleophas's family, men sending to women is significantly overrepresented and is compared to an identical network where gender is randomized (Table 3). In Julia's family, however, men and women send and receive equally.

In Cleophas's network, men are money senders and women are receivers. In Julia's network, both men and women are senders and receivers of mobile money remittances. Many members of Cleophas's family occupy rural areas south of Bungoma. All the women in the network described themselves as farmers. These women accessed cash through remittances or through selling farm produce. Julia's family included women and men with wage income. Women in Julia's family were civil servants, an accountant, an agricultural field officer, and traders. Many also participated in savings groups. The comparison of Julia's and Cleophas's families indicate that urbanization and wage labor have given women the social empowerment of sending ability. When considering money-sending relationships from urban to rural kin, women may overwhelmingly be receivers (Stuart and Cohen 2011), but within some hearthholds, women may take on a sender or provider role in networks. The families indicate the importance of money in expressing the dynamic of changing gender relationships for women wage earners.

Bitter mobile money

Women's advantaged positions in money transfer networks should not too hastily pass for proof of the empowerment story of mobile money-its ability to give women authority and decision making in their households and networks. In fact, central roles in SNA sociograms often mask women's persistent difficulties in accessing resources in polygynous marriage, in meeting household needs, and even in using handsets and SIM cards. In our surveys, most remittances were to meet emergency needs for transport, medical care, or consumption. Remittances bestow

responsibilities around farm labor and the purchasing and coordinating of fertilizers, weeding, and harvesting. Furthermore, as many as half of grandmothers in western Kenyan communities are raising and feeding grandchildren born outside of marriage (Kilbride and Kilbride 1997). Such children are often excluded from patrilineal inheritance and can potentially suffer the consequences of neglect (Nyambedha et al. 2003). In Cleophas's and Julia's families, many money transfers to mothers are intended to support children born out of wedlock. By furthering privacy and secrecy in the case of the rejection of out-of-wedlock children, e-money may perpetuate the social boundaries of lineage organization and the burdens it places on foster grandparents.

Furthermore, "advantage" in social networks must be culturally situated. In cultures that value reciprocity, brokerage and centrality can bring pressures to recirculate funds (Peeples and Haas 2013). A request cannot be denied; instead, one's phone must be shut off or "lost" to avoid pressure for remittances. Older women see many visitors once word of a recent remittance spreads in the community; they often share their PINs and consequently avoid using their mobile wallets as a store of value. In another case, a mother and a broker in one of our graphs languished in the hospital with typhoid, as the children in her network squabbled over who would pay the bill.

Finally, women's important roles in mobile money networks are achieved despite significant barriers to accessing SIM cards and handsets. Julia (Figure 1) does not have a phone; she uses her daughter Evelyn's phone and account. Another woman's husband destroyed the phone she used to receive remittances from a sister in the United States and hid her identification records to prevent her from registering another M-Pesa account.

Men, fathers, and hearthholds

Despite social change, numerous factors have encouraged the persistence of patrilineal social identity and its implications for inheritance of land and other significant assets. Colonial land policies favored individual title deeds, almost exclusively to male family heads (Nasimiyu 1997). Wage employment in western Kenya is still undertaken overwhelmingly by men, often in nearby or urban areas; women in charge of rural farmlands are often in positions of dependency to husbands or sons. Our 2012 team interviewed 33 women farmers on the outskirts of Ki tale town, almost all of whom farmed land deeded to a husband, father, or brother; some of our women interlocutors had unsuccessfully challenged brothers for inheritance rights.

The father-son-based extended family and the assets and privileges it produces can be a valued insurance policy. Nonfarming efforts may fail or incur losses, and new economic ventures, such as a trading business, are often undertaken on a trial-and-error basis and are frequently abandoned because of poor returns or lack of capital. Farming and collective work are also strong referents of community solidarity and cultural identity (Shipton 2009; Cattell 2005). Rituals of the life course still involve the elders in negotiating with in-laws over bridewealth cattle; in a 2014 ritual cycle for circumcision of adolescent boys, our research team found that both "Christian" and "traditional" ceremonies were held-the Christian essentially being smaller in scale and expense. Both types of ceremonies involved donations to ritual feasts and gifts, and in both, the father's side of the family took the lead in organizing. In both, however, the mother's brother made significant gifts, either in bridewealth cattle or in donations for the boy's school fees.

For two reasons, thee-money circulations of the hearthhold largely avoid overtly challenging the father-based family ideal. First of all, these digital gifts express emotional ties particularly associated with mothers, grandmothers, and siblings and widely considered to be natural expressions of love and caring. In western Kenya, they are viewed as a money of the domestic sphere and a money of emotional intimacy (Zelizer 1994, 2005). The social meaning of these remittances often seems much greater than their economic import-they are what Cliggett (2003) terms "gift remittances." Their generally small size allows people in effect to make significant material investment in the hearthhold over time without threatening the patrilineal ideal. Mothers said, "I have many children who love me" or "My children know when I will need money. They will send before I have trouble." Others said, "I send money [to my grandmother] because I love her" or gave similar expressions of emotional closeness as the reason for sending remittances. A young woman is known to be particularly close to the grandmother who raised her; her cousins assume she receives the most e-money, but she cheerfully confided that she does not.

Helping fathers involves larger amounts of money, often in assisting with profit-seeking projects together with brothers or others (Singh 2013). Furthermore, granting access to farmland or other significant resources often obviates any need to support a relative through remittances. By contrast, fathers are disadvantaged in exchanges associated with emotional affect. A young secretary explained,

> My father had four wives. Mother is number two. We are 22 altogether. In our family the co-wives did not work together . ... In our family we were sidelined by our father. It was my mom who used to support us with her farming .... He [Father] was unfair to us. Sometimes there is an occasion-right now Dad is on treatment .. . . When you call people to come together . . . we are so bitter . .. . He didn't help us.

The social role of gifts in clarifying rights and obligations, defining inequalities, and soothing bitterness or resentment is an important theme of ethnography here (Hyden 1983; Shipton 1989; Wandibba 1997; Mutongi 2007). The social meaning of remittances means money is sent merely to save face, appear generous, avoid backbiting, or dampen social conflict. For example, a man's digital payments to his mother, intended to support the family farm, must be balanced by money sending to his wife to provide for her beauty products, to avoid conflict between the two women. The intended use of a remittance tends to influence its meanings but can be at odds with its uses. When asking an international migrant in the United States for assistance, stay-behinds overwhelmingly ask for assistance with school fees; but such funds can end up serving social purposes, such as paying prior debts, funding a visible donation to a church, or preparing coming-of-age rituals.

Digital circulations within the hearthhold are enacted by personal communication with mobile phone handsets. Although phone and SIM card sharing is widespread, there is still a privacy and secrecy associated with mobile phones here, one that often associates their use with illicit affairs, greed, secrecy, dishonesty, or betrayal. Among elders, mobile phones are perceived as empowering women and youths to pursue affairs or run away from school (Kusimba et al. 2015a; see also McIntosh 2010). Both men and women are implicated in such accusations, and both use the handset to send money to the hearthhold illicitly. A retired policewoman described "a lot of wrangles over money" with her two co-wives; she relies on secret remittances from her brother and son to support her farm activities. A 52-year-old widow was forced off her husband's

land at his death; she returned to her father's land, where she assists her brother and his wife. Her brother remits her children's school fees, unbeknownst to his wife, "who despises my presence here .... With this [M-Pesa account] I have been able to educate my children with my brother's help without his wife discovering." Men, such as brothers Augustine, Rodgers, and Vincent in Julia's family (Figure 1), often sit in between their siblings, on one hand, and their wives and children, on the other. This balancing act is often achieved through the secrecy and privacy of the handset.

Conclusion

Mobile money transfer patterns reveal the importance of hearthhold networks among a set of families in western Kenya and may reflect broader patterns as polygynous families fragment into family groups where sibling ties are important (Ekejiuba 2005; Nasimiyu 1997; Mutongi 2007; Meagher 2005). They show the continuing importance of siblings despite broader ambivalence about kin and family roles (Cattell 2009; Wandibba 1997). However, they may also reveal enduring dependency and exclusion from wealth-building resources. Nevertheless, practices of reciprocity allow women to send, broker, and recirculate value, especially when they are wage earners.

Money remittances of the hearthhold are aimed at sustaining and investing in family members - socially, emotionally, intellectually, and spiritually. As such, their importance goes far beyond the hearthhold. Money gifts are rarely large enough to be intended toward widespread ideals of profit seeking and investment, but they are part of the reshaping of persons and families around these ideals. They support and make possible the dispersion and flexibility of families and groups and the coordination of agency within them, thus opening new pathways toward "gifts that keep on giving."

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References

Brin, Sergei, and Larry Page. 1998 The Analogy of a Large-Scale Hypertextual Web Search Engine. Computer Networks and ISDN Systems 30:107117.

Bryceson, Deborah. 2002 Multiplex Livelihoods in Rural Africa: Recasting the Terms and Conditions of Gainful Employment. The Journal of Modern African Studies 40(1): 1-28.

Cattell, Maria. 2005 African Reinventions: Home, Place, and Kinship among the Abaluyia of

Kenya. In Home and Identity in Late Life: International Perspectives. Graham D. Rowles and Habib Chaudhury, eds. Pp. 219-236. New York: Springer.
Cattell, Maria. 2009 Global Perspectives on Widowhood and Aging. In The Cultural Context of Aging: Worldwide Perspectives. Jay Sokolovsky, ed. Pp. 155-172. Westport, CT: Greenwood Press.
Clark, Shel ley, and Dana Hamplova. 2013 Single Motherhood and Child Mortality in Sub-Saharan Africa: A Life Course Perspective. Demography 50(5): 1521-1549.
Cliggett, Lisa. 2003 Gift Remitting and Alliance Building in Zambian Modernity: Old Answers to Modern Problems. American Anthropologist 105(3):543-552.
Collier, Jane. 1988 Marriage and Inequality in Classless Societies. Stanford, CA: Stanford University Press.
Collier, Jane, and Sylvia Yanagisako. 1987 Introduction. In Gender and Kinship: Essays towards a Unified Analysis. Jane Collier and Sylvia Yangisako, eds. Pp.1- 13. Palo Alto, CA: Stanford University Press.
Ekejiuba, Felicia. 2005 Down to Fundamentals: Women-Centered Hearth-Holds in Rural West Africa. In Readings in Gender in Africa. Andrea Cornwall, ed. Pp.41-46. Bloomington: Indiana University Press.
Financial Sector Deepening. 2014 Kenya Financial Diaries: Shilingi Kwa Shilingi-Financial Lives of the Poor. Nairobi: Financial Sector Deepening.
Foster, Brian, and Stephen Seidman. 1981 Network Structure and the Kinship Perspective. American Ethnologist 8(2):329-355.
Gates Foundation. 2015 Putting Women and Girls at the Center of Development. http://gcgh.grandchallenges.org/GCGHDocs/WGCD_RFP.pdf, accessed November 11, 2015.
Government of Kenya. 2009 Government of Kenya 2009 Census: Household Assets Ownership. https://www.opendata.go.ke/PovertyNol-11-Table15-Household-Assets-Ownership-2009/enyp-j5xk, accessed December 30, 2015.
Green, Maia. 2015 Making Africa Middle Class: From Poverty Reduction to the Production of Inequality in Tanzania. Economic Anthropology 2:295-309.
Groupe Speciale Mobile Association (GSMA). 2012 Striving and Surviving: Exploring the Lives of Women at the Base of the Pyramid. http://www.gsma.com/mobilefordevelopment/gsma-mwomen-striving-and-surviving-explori ng-the-lives-of-bop-women, accessed November 11, 2015.
Hyden, Goren. 1983 No Shortcuts to Progress: African Development Management in Perspective. Berkeley: University of California Press.
lazzolino, Gianluca. 2014 Contingency Routes: Somali Financial Flows and Transnational Spaces between Kenya and Uganda. http://www.imtfi.uci.edu/files/docs/2014/gianlucaiazzolino_report_final_ 101414_2.pdf, accessed September 5, 2015.
Johnson, Susan. 2012 The Search for Inclusion in Kenya's Financial Landscape: The Rift Revealed. Nairobi: Financial Sector Deepening.
Johnson, Susan. 2014 Informal Financial Practices and Social Networks: Transaction Geneologies. Nairobi: Financial Sector Deepening.
Kendall, Jake, Bill Maurer, Phillip Machoka, and Clara Veniard. 2011 An Emerging Platform: From Money Transfer System to Mobile Money Ecosystem. Innovations: Technology, Governance, Globalization 6(4):49-64.

Kiili, Ndunge, and Jane Mutinda. 2011 Mobile Money Services and Poverty Reduction: A Study of Women's Groups in Rural Eastern Kenya. Working paper, Institute for Money, Technology, and Financial Inclusion. http://www.imtfi.uci.edu/files/blog_working_papers/kenyan_mobile_money-imtfi_working_paper_2011-2.pdf, accessed July 7, 2015.

Kilbride, Philip, and Janet Kilbride. 1997 Stigma, Role Overload, and Delocalization among Contemporary Kenyan Women. In *African Families and the Crisis of Social Change*. Thomas S. Weisner, Candace Bradley, and Philip Kilbride, eds. Pp. 208-223. Westport, CT: Bergen and Garvey.

Kilbride, Philip, Collette Suda, and Enos Njeru. 2000 *Street Children in Kenya: Voices of Children in Search of a Childhood*. Westport, CT: Bergen and Garvey.

Kusimba, C. M., and C. 0. Wilson. 2007 *Contemporary Socio-economic Dynamics of Bungoma County: Bungoma County in Archaeological, Historical, and Contemporary Perspectives*. Chicago: The Field Museum.

Kusimba, Sibel, Harpieth Chaggar, Elizabeth Gross, and Gabriel Kunyu. 2013 Social Networks of Mobile Money in Kenya. http://www.imtfi.uci.edu/files/2013-1_kusimba_ 1.pdf, accessed July 25, 2015.

Kusimba, Sibel, Gabriel Kunyu, and Alex Wanyama. 2015a Mobile Money and Coming of Age in Western Kenya. http://www.imtfi.uci.edu/files/docs/2015/Final Report Kusimba.pdf, accessed November 11, 2015.

Kusimba, Sibel, Yang Yang, and Nitesh Chawla. 2015b Family Networks of Mobile Money in Kenya. *Information Technologies and International Development* 11(3):1-21.

Ledgerwood, Joanna, and Alyssa Jethani. 2013 Savings Groups and Financial Inclusion. In *Savings Groups at the Frontier*. Candace Nelson, ed. Pp. 13- 38. Bourton on Dunsmore, UK: Practical Action.

Lijembe, Joseph A., Anna Apoko, and Mutuku Nzioki. 1967 *East African Childhood: Three Versions*. Oxford: Oxford University Press.

Lindell, Ilda. 201 0 Between *Family and Market: Urban Informal Workers' Networks and identities in Bissau*, Guinea-Bissau. In *How Africa Works: Occupational Change, Identity and Morality*. Deborah Bryceson, ed. Pp. 149-164. Bourton on Dunsmore, UK: Practical Action.

Ling, R., and S. W. Campbell. 2010 Introduction: The Reconstruction of Space and Time through Mobile Communication Practices. In *The Reconstruction of Space and Time: Mobile Communication Practices*. Rich Ling and Scott W. Campbell, eds. Pp. 1-13. New Brunswick, NJ: Transaction.

Makila, Fred E. 1978 *An Outline History of Babukusu of Western Kenya*. Nairobi: Kenya Literature Bureau.

Mas, Ignacio. 2013 Beyond Products: Building Integrated Customer Experiences. In *The New Microfinance Handbook: A Financial Market System Perspective*. Diana Ledgerwood, ed. Pp. 299-318. Washington, DC: The World Bank.

Mas, Ignacio, and Dan Radcliffe. 2011 Scaling Mobile Money. *Journal of Payments Strategy And Systems* 5(1): 1-19.

Maurer, Bill. 2012 Mobile Money: Communication, Consumption and Change in the Payments Space. *Journal of Development Studies* 48(3): 1-16.

Maxon, Robert. 2003 *Going Their Separate Ways: Agrarian Transformation in Kenya, 1930-1950*. Cranbury, NJ: Associated University Press.

McIntosh, Janet. 2010 Mobile Phones and Mipoho's Prophecy: The Powers and Dangers of Flying Language. *American Ethnologist* 37(2):337- 353.

McKay, Claudia, and Michelle Kaffenberger. 2013 Rural versus Urban Mobile Money Use: Insights from Demand-Side Data. *CGAP Blog.* http://www.cgap.org/blog/rural-vs-urban-mobile-money-use-insights-demand-side-data, accessed October 27, 2015.

McKay, Claudia, and Rafer Mazer. 2014 10 Myths about M-PESA: 2014 Update. *CGAP Blog*. http://www.cgap.org/blog/10-myths-about-m-pesa-2014-update, accessed April 20, 2015.

Meagher, Kate. 2005 Social Capital or Analytical Liability? Social Networks and African Informal Economies. *Global Networks* 5(3):217-238.

Meagher, Kate. 2010 Social Capital or Social Exclusion? Social Networks and Informal Manufacturing in Nigeria. In *How Africa Works: Occupational Change, Identity and Morality*. Deborah Bryceson, ed. Pp. 105-127. Bourton on Dunsmore, UK: Practical Action.

Morawczynski, Olga. 2009 Exploring the Usage and Impact of "Transformational" Mobile Financial Services: The Case of M-PESA in Kenya. *Journal of Eastern African Studies* 3(3):509-525.

Munyua, Alice Wanjira. 2009 Women Entrepreneurs in Nairobi: Examining and Contextualizing Womens' Choices. In *African Women and ICTs: Investigating Technology, Gender, and Empowerment*. lneke Buskens and Anne Webb, eds. Pp. 119-132. London: Zed Books.

Mutongi, Kenda. 2007 *Worries of the Heart: Widows, Family and Community in Kenya*. Chicago: University of Chicago Press.

Narotzky, Susana, and Niko Besnier. 2014 Crisis, Value, and Hope: Rethinking the Economy. *Current Anthropology* 55(9):S4-S16.

Nasimiyu, Ruth. 1997 Changing Women's Rights over Property in Western Kenya. In *African Families and the Crisis of Social Change*. Thomas Wiesner,Candac e Bradley, and Philip Kilbride, eds. Pp. 283-298. Westport, CT: Bergin and Garvey.

Newman, Mark. 2010 *Networks: An Introduction*. Oxford: Oxford University Press.

Nyambedha, Erick, Simiyu Wandibba, and Jens Aargard-Hansen. 2003 Retirement Lost: The New Role of the Elderly as Caretakers for Orphans in Western Kenya. *Journal of Cross-Cultural Gerontology* 2003:33-52.

Peeples, Mattew, and Randall W. Haas. 2013 Brokerage and Social Capital in the Prehispanic U.S. Southwest. *American Anthropologist* 115(2):232-247.

Prell, Christina. 2011 *Social Network Analysis: History, Theory, and Methodology*. New York: Sage

Radcliffe-Brown, A. R. 1952a On Social Structure. In *Structure and Function in Primitive Society*. E. Evans-Pritchard and F. Eggan, eds. Pp. 188-204. London: Cohen and West.

Radcliffe-Brown, A. R. 1952b The Mother's Brother in South Africa. In *Structure and Function in Primitive Society*. A. R. Radcliffe-Brown, ed. Pp. 15-31. London: Routledge and Kegan Paul.

Rasmussen, Stephen. 2011 Customers-Especially Women-Drive Mobile Money Adoption. *CGAP Blog*. http://cgap.org/blog/customers-\ %E 2\ %80\ %93-especially-women-\ %E2\ %80\ %93-drive-mobile-money, accessed January 1, 2015.

Shipton, Parker. 1989 *Bitter Money: Cultural Economy and Some African Meanings of*

Forbidden Commodities. Washington, DC: American Anthropological Association.
Shipton, Parker. 2009 *Mortgaging the Ancestors: Ideologies of Attachment in Africa*. New Haven, CT: Yale University Press.
Singh, Supriya. 2013 *Globalization and Money: A Global South Perspective*. New York: Rowman & Littlefield.
Stovel, Katherine, and Lynette Shaw. 2012 Brokerage. *Annual Review of Sociology* 38(1):139-158. http://www.annualreviews.org/doi/abs/10.1146/annurev-soc-081309-150054, accessed June 4, 2013.
Stuart, Guy, and Monique Cohen. 2011 *Cash In, Cash Out Kenya: The Role of M-PESA in the Lives of Low-Income People*. Washington, DC: Microfinance Opportunities.
Taylor, Erin B., and Heather A. Horst. 2013 From Street to Satellite: Mixing Methods to Understand Mobile Money Users. *Ethnographic Praxis* 2013(1):88-102.
Vaughan, Megan. 2005 Which Family? Problems in the Reconstruction of the History of the Family as an Economic and Cultural Unit. In *Readings in Gender in Africa*. Andrea Cornwall, ed. Pp. 119-122. Bloomington: Indiana University Press.
Wagner, Gunter. 1975 *The Bantu of North Kavirondo*. 2 vols. London: Oxford University Press for International African Institute.
Wandibba, Simiyu. 1985 *History and Culture in Western Kenya: The People of Bungoma District through Time*. Nairobi: G. S. Were Press.
Wandibba, Simiyu. 1997 Changing Roles in the Bukusu Family. In *African Families and the Crisis of Social Change*. T. S. Wiesner, C. Bradley, and Philip Kilbride, eds. Pp. 332-340. Westport, CT: Bergen and Garvey.
Wandibba, Simiyu, Stevie Nangendo, and Benson Bulemi. 2013 Gender Empowerment and Access to Financial Services in Machakos County, Kenya. http://www.imtfi.uci.edu/files/docs/2014/wandibba_imtfi_final_report.pdf, accessed May 10, 2015.
Wasserman, Stanley, and Katherine Faust. 1994 *Social Network Analysis: Method and Application*. Cambridge: Cambridge University Press.
Were, Gideon. 1967 *A History of the Abaluyia of Western Kenya, c. 1500-1930*. Nairobi: East African Publishing House.
Wolf, Margery. 1972 Uterine Families and the Women's Community. In *Women and the Family in Rural Taiwan. Margery Wolf, ed. Pp. 166-169. Palo Alto, CA: Stanford University Press.*
Yanagisako, Sylvia Junko. 1977 Women-Centered Kin Networks in Urban Bilateral Kinship. *American Ethnologist* 4:207-226.
Zelizer, Viviana. 1994 *The Social Meaning of Money*. New York: Basic Books.
Zelizer, Viviana. 2005 *The Purchase of Intimacy*. Princeton, NJ: Princeton University Press.