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Mobile phones and women's empowerment in Maasai communities: How men shape women's social relations and access to phones

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ABSTRACT

Mobile phones have been heralded by many as promising new tools to empower women throughout the Global South. However, some have asserted that new information and communication technologies (ICTs) may serve to amplify disparities between more powerful and less powerful people. Few studies have examined which women stand to benefit and under what conditions. This study seeks to better understand the relationships between mobile phones and women's empowerment by examining diverse women's experiences within Maasai agro-pastoralist communities in northern Tanzania. Specifically, we ask three guiding questions: (1) How do Maasai women access and use phones? (2) What processes of empowerment do phones support or undermine? and (3) How are these processes embedded in diverse social relations? To address these questions, we use a framework that integrates a Social Relations Approach with a modified version of the Sustainable Livelihoods Approach. Our team conducted semi-structured and individual-stakeholder interviews with Maasai women in June-July, 2018 to learn their perspectives on phones, social-relations and multiple aspects of empowerment. We analyzed the content of these interviews using deductive and inductive qualitative strategies. These efforts yield multiple findings: (1) women's access to phones is fluid; (2) multiple pathways to empowerment and disempowerment exist; (3) phones reinforce inequalities; (4) women's identities are intersectional; and (5) women's networks remain homogenous. Taken together, this approach and these insights provide a more conservative account of the benefits of mobile phones than many studies and also an important technology-empowerment narrative for development scholars and practitioners.

1. Introduction

The United Nations' fifth Sustainable Development Goal emphasizes the importance of expanding freedoms for all people by eliminating discrimination against women; promoting gender equality; and increasing women's access to education, paid work, political representation and information and communication technologies (ICTs) United Nations, (2015). While women's empowerment is intrinsically important, studies in developing areas show that empowering women can also increase economic growth (OECD, 2012), improve children's health and education (World Bank, 2012), decrease child mortality (Gakidou et al., 2010), improve organizational effectiveness of businesses (McKinsey & Company, 2017), and increase agricultural productivity (Fao, 2014). Many development agencies, local and national governments, and civil society organizations, operating in rural communities of the Global South, believe that harnessing new technologies, like mobile phones, can advance gender equality by empowering women (Santosham and Lindsey, 2015; Rowntree, 2018).

Studies of ICTs for development (ICT4D) have discussed how mobile technologies can support a range of positive economic and social outcomes for women. They have been found to help women gain employment (Hilbert, 2011), enhance their earnings (Davis, 2007; Huyer and Carr, 2002) reduce barriers to communication and information search (Antonio and Tuffley, 2014), develop independence (Onyejekwe, 2011), increase economic power (Cummings and O'Neil, 2015; Brodman and Berazneva, 2007; Davis, 2007), and participate in domestic decision-making (Hoan et al., 2016). In addition, studies have found that ICTs can yield a number of more social benefits including: closer family ties (Smith et al., 2011; Chib et al., 2014); improved psychological well-being (Smith et al., 2011; Chew et al., 2015); greater individual autonomy (Tacchi et al., 2012); and stronger social support (Chib et al., 2013). Some studies have even found that adoption of ICTs can challenge traditional gender norms (Chib and Hsueh-Hua Chen, 2011, Tenhunen, 2008; Kelkar and Roman, 2002; Garrido and Roman, 2006). But while several studies have identified the various ways phones promote empowerment, few have examined how ICTs may have

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diverse effects on women – or questioned *which women* benefit from phone use or how *social relations* may be integral to phones' effects (Chan, 2015; Jeni et al., 2014).

Relatedly, some scholars have argued that access to, and use of, mobile phones, like other technologies, are gendered (Castells et al., 2009; Wyche and Olson, 2018), and have questioned the transformative power of phones for marginalized groups (Cummings and O'Neil, 2015), especially when local contexts and social relations are considered (McNamara, 2003; Gigler, 2004). Related studies in the Global South have examined gendered digital-divides where low levels of education, employment, or income reduce access to phones (Hilbert, 2011; Cullen, 2001; Broadband, 2017). In several cases, scholars have found that phones have not transformed social relations but appear instead to support existing social structures (Baird and Hartter, 2017). Others have found that the benefits of phone use are strongly influenced by existing social patterns (Asaka and Smucker, 2016; Butt, 2015). Relatedly, scholars have argued that existing approaches to examine the effects of ICTs on communities in the Global South have been limiting (Duncombe, 2006), with many studies focusing on mobile phone access in urban contexts and few studies of what happens after access, especially in rural areas where the stakes for women may be greatest (Castells et al., 2009; Donner, 2015).

Taken together, the discussions surrounding ICT4D highlight the value of examining local social contexts including gender relations, and the lack of research in rural areas. Rural areas are especially important contexts in which to examine issues related to vulnerability (Rigg et al., 2016; Leichenko and O'Brien, 2002), gender (Little, 1987; Dixon-Mueller, 2013), and the effects of ICTs (Best and Maier, 2007; Duncombe, 2016). Compared to others, rural communities may have smaller labor markets, weaker health care and education infrastructure, more stringent gender roles, greater barriers to mobility and transportation, and higher costs (Woods, 2004).

In the Global South, pastoralist groups exemplify those who struggle with the challenges of living in rural areas. Specifically, pastoralism itself is an adaptive strategy in areas where uncertain environmental resources are spread across great physical distances. And pastoralists can benefit greatly from mobile phones, which eradicate distance as a barrier to communication. Studies of vulnerable pastoralist and agro-pastoralist groups have examined how mobile phones have been used to support shifting economic activities (Baird and Hartter, 2017), mitigate human-wildlife conflict (Lewis et al., 2016), access information about markets and grazing (Debsu et al., 2016), enhance social connectedness (Djohy et al., 2017), carry out financial transactions (Msuya and Annake, 2013), and exchange information related to livestock herding (Butt, 2015). We are aware of no studies, however, that have examined gendered phone use in these contexts.

Here we focus on Maasai, a well-studied pastoralist group, which is strongly patriarchal and has adopted mobile phones widely. The central purpose of this study is to examine how phones may empower or disempower women in Maasai communities in northern Tanzania. Specifically, this work examines three specific research questions: (RQ1) How do Maasai women access and use phones? (RQ2) What processes of empowerment do phones support or undermine? and (RQ3) How are these processes embedded in diverse social relations?

2. Background

To address these questions, we begin with a brief review of the evolution of scholarship on women's empowerment, and the current trends in scholarship connecting empowerment to technology and intersectionality, which inform our development of a conceptual model in the following section.

2.1. Women's empowerment

Given the importance of women's empowerment, many efforts have been made to frame and characterize it since the concept gained traction in the 1980s (Cornwall, 2016). Discussing empowerment broadly, Rappaport argued that it is a process by which "people … gain mastery over their lives" Rappaport (1984, 1). Speaking of women specifically, Sen (1993) added that empowerment targets the relations of power that "constrain women's options and autonomy and adversely affect health and well-being." However, as women are often in subordinate positions, Batliwala offered a view of the empowerment process wherein "women gain control … and challenge the ideology of patriarchy and gender-based discrimination against women in all institutions and structures of society" Batliwala (1994, 130).

Seizing on the importance of social relations in women's lives, Kabeer (1994) focused on the ways that institutions at the family, market, community, and state levels produce and reinforce social relations. Gender is one type of social relation that influences the distribution of resources, responsibilities, and power among men and women (Moser, 1989; Quisumbing et al., 2014). Institutional norms regulate access to valuable resources and ultimately the practice of agency (Goldman and Little, 2015). Women's empowerment goes beyond reallocating responsibilities and resources, but actually involves a "redistribution of power" (Miles, 2016, 4) in social relations (Kabeer, 1994). A critical insight here is that gender inequalities are not supported by assets alone, but in how normative social relations shape access to assets, opportunities, and decision-making power. Despite the academic debate surrounding empowerment, ideas have coalesced around some common principles. First, empowerment, by its nature is related to power, which can be seen as "the ability to make choices" (Kabeer, 2005, 13). Second, changes in power need firm roots in both private and public systems (Kitunga and Mbilinyi, 2009). Correspondingly, empowerment is a dynamic, socio-economic process that exists between the individual and broader community (Batliwala, 2007; Gigler, 2004).

Given the broad scope of concerns surrounding empowerment, scholars have examined many topics across a wide range of contexts (Malhotra et al., 2002). Studies have examined many topics, including: educational attainment (Takayanagi, 2016), political participation (Grabe, 2015), gender-based domestic violence (Wekwete et al., 2014), resource control (Rao, 2017; Solanke et al., 2018; Ragsdale et al., 2018), entrepreneurialism (Kapinga and Montero, 2017), well-being (Fielding and Lepine, 2017), household decision-making (De Brauw et al., 2014; Sumner et al., 2016; Maligalig et al., 2019), time poverty (Bain et al., 2018) and health (Hindin, 2000; Badejo et al., 2017). Ultimately, in both academic research and development practice, strategies often focus on isolated aspects of empowerment to frame, implement, and measure outcomes of development interventions that focus on empowerment (Malhotra et al., 2002). Despite this range of scholarship, important concerns remain.

2.2. Empowerment, technology, and intersectionality

One concern is that discussions surrounding women's empowerment and technology tend to frame women as a homogenous group (Bailur et al., 2018). Specifically, many studies of ICTs in developing contexts fail to account for *differences* in women's identities and daily lived experiences with phones, with some exceptions (Hoan et al., 2016, Choudhury, 2009; Faith, 2018; Wyche and Olson, 2018). But women experience different individual, social, economic, political, and technological constraints and opportunities. In response to this growing awareness, focus on *intersectionality,* which describes the multiple, interacting identities of an individual (or group) based on age, race, ethnicity, gender and other attributes (Crenshaw, 1989, 1991), has become prominent in gender studies (McCall, 2005). It highlights the dynamic and relational nature of power and social stratifications (Hankivsky, 2014) and is especially relevant amidst the widespread diffusion of mobile technologies, which can accelerate communication and interaction, in turn shaping identity. O'Donnel and Sweetman argue

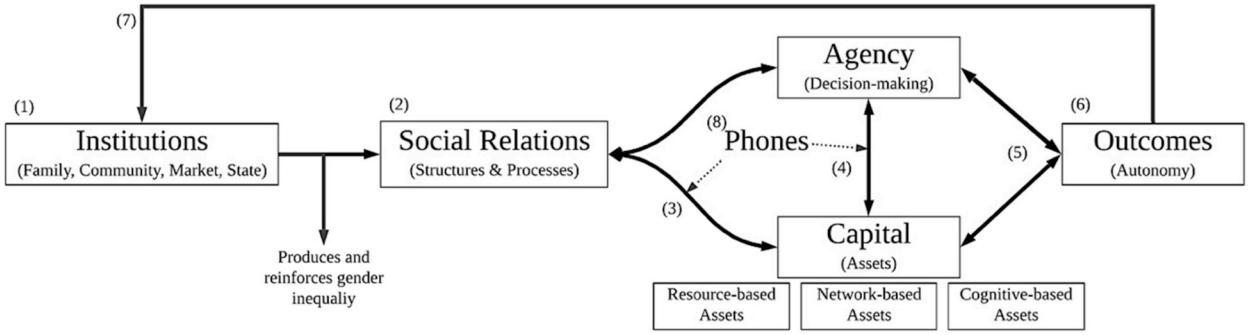

Fig. 1. Conceptual model for research adapted from Kabeer (1994, 2005) and Duncombe (2014).

that "technology mirrors the societies that create it, and access to (and effective use of) technologies is affected by intersecting spectrums of exclusion including gender, ethnicity, age, social class, geography, and disability" O'Donnel and Sweetman (2018, 217). While some studies have considered differences in women's experiences with mobile technology based on income (Faith, 2018), age (Zelezny-Green, 2018), and residential status (Hoan et al., 2016), more can be done to examine how women's diverse social positions and relations can shape their abilities to leverage mobile technologies and gain power.

3. Study context

3.1. Conceptualizing phones in women's empowerment

To address our research questions, we have created a conceptual framework, shown in Fig. 1, which draws from Kabeer's social relations approach (SRA) and a *modified* version of the popular Sustainable Livelihoods Approach (SLA) (Duncombe, 2014). While other frameworks may be useful here, including those that focus on vulnerability (Moser et al., 2001), we integrate these approaches because they position social relations as central to processes of empowerment and modify the livelihoods approach specifically for ICT research, respectively. Consequently, our framework outlines the following guiding premises: (1) institutional norms create and reinforce social relations; (2) gendered social relations create and reproduce differences in the structural positioning of women and men; (3) social position influences what resources people can access; (4) resources are necessary to exercise agency; (5) resources and agency together make up people's capabilities; (6) capabilities support individual and collective outcomes; and (7) outcomes contribute to, or undermine, institutional norms that produce and reinforce gender inequalities. We hypothesize that while social position influences mobile phone access, phones increase access to diverse resources, which provide opportunities to renegotiate gender norms (8).

The SLA, which is discussed extensively elsewhere (Scoones, 1998), assumes that households need a variety of assets to improve their livelihoods. A critical weakness of this common framework is that it does not capture *intra-household inequalities* in the distribution of resources, which are often gendered (Krantz, 2001). Individuals in inferior social positions within the household can be more vulnerable to the effects of undesirable livelihood outcomes, which can lead to a cycle of deepening vulnerability and widening inequalities (Radel et al., 2013).

Following Duncombe's (2014) suggestions to improve the SLA for ICT research, this study adjusts the traditional SLA and its assets into three broader, more ICT relevant asset categories: resource-based assets, network-based assets, and cognitive-based assets. Table 1 illustrates the alignment between the traditional SLA and Duncombe's proposed adjustments as well as ICT-relevant examples for each asset category.

To address RQ1 and RQ2, we identify the resource-based, network-based, and cognitive-based assets women need to access and use a phone, and how phones may support or undermine processes of empowerment. For RQ3, we examine how social position within the household and the larger community may influence women's access to assets and decision-making power within and beyond the household.

3.2. Maasailand and women

This conceptual framework guides our study in five communities within Maasailand, a broad geographic area extending from southern Kenya into northern Tanzania, which has been defined as those regions historically dominated by Maa speaking peoples (Spear and Waller, 1993). This area remains the center of contemporary Maasai livelihoods and identity, which are still firmly rooted in traditional mobile livestock production and longstanding systems of social organization (Homewood et al., 2009).

In Maasai society, the structures that shape social position are complex. First, Maasai are polygynous, traditionally taking multiple wives, though norms are shifting as Christianity promotes monogamy (Baird, 2015). A household (*olmarei*) is typically comprised of a married man and his wives, each of whom have a shelter (*enkaji*) where she lives with her children. Households live within a fenced enclosure (*enkaang*), which may include multiple households, each with multiple wives and their children. These households may include extended family (e.g., father and married sons) or friends (e.g., household heads who are members of the same Maasai age-set). Correspondingly, an *enkaang* typically contains many individuals, each with various endowments of the three types of assets described above, who are connected through a multitude of relationships strongly shaped by various social norms.

A rich body of feminist scholarship has highlighted Maasai women's diverse experiences within an evolving context. In the post-colonial period, early development initiatives neglected women - and as men became the primary conduits of development, many women lost previously held rights and freedoms, including: participation in household decision-making, autonomy in mobility, and rights over livestock (Hodgson, 2001, 2005). Furthermore, the protracted diversification of the Maasai economy into agriculture and wage labor migration (Homewood et al., 2009; Leslie and McCabe, 2013; Baird and Leslie, 2013), along with recent development interventions to enhance women's political and economic voices (Goldman and Little, 2015), at once challenge and perpetuate traditional pastoral gender norms (Smith, 2015).

As Maasai pastoralist livelihoods have diversified and become more sedentary (Fox et al., 2019) both men and women have adopted new labor roles, mirroring other groups' transitions (Barrett et al., 2001). Many men now leave the community to pursue additional income-generating opportunities and children attend school (Smith, 2015). As a result, some women have assumed new responsibilities with livestock production (Wangui, 2008), as well as income-generating activities (Smith, 2015), but these efforts may come on top of their continued traditional roles in the household, increasing workloads (Cornwall, 2003). While shifting gender roles might empower some women, these

Table 1
Sustainable Livelihoods Framework adaptations for ICTs.

SLA capital types	Duncombe's SLA to ICTs	ICT-relevant examples
Physical Financial Natural	Resource-based assets	Mobile phone handset, SIM, electricity, phone vouchers, signal, financial income, financial services
Social	Network-based assets	Group membership, relationships, leadership, trust, reciprocity, social status, social network
Human	Cognitive-based assets	Education, literacy, technical/e-literacy, local knowledge, perceptions, skills, capabilities

activities can also challenge age-set and gender traditions, causing men to withdraw support for empowerment initiatives.

While studies have shown how some women can increase their agency when they gain access to land (Grabe, 2015; Goldman et al., 2016), participate in adult education development initiatives (Dutt and Grabe, 2017), or adopt additional income-generating activities (McCoy et al., 2013; Smith, 2015), women are still considered subordinate to men (Goldman and Little, 2015) and have few opportunities to participate in decision-making (McCoy et al., 2013). A woman's ability to access land, livestock, information, markets, and education, are each limited not only by her gender, but also her age, wife number, and number of children, as well as her husband's age and education (Woodhouse and McCabe, 2018). It is within this context that we examine the effects of mobile phones on diverse Maasai women, especially their empowerment.

3.3. Study site

Simanjiro and Longido Districts in northern Tanzania are ideal sites to investigate how vulnerable women use mobile technologies. Like much of rural sub-Saharan Africa, these areas have steadily gained access to mobile networks and affordable phones (Sachedina and Trench, 2009; Baird and Hartter, 2017; Bowen et al., 2010). Also, these districts are predominately ethnically Maasai (MacKenzie et al., 2014; Trench et al., 2009), sharing cultural norms, including strongly patriarchal practices (Goldman and Little, 2015), reciprocal exchange (Baird and Gray, 2014), and shifting gender norms (Wangui, 2008). We collected data in five villages: Loiborsoit, Emboreet, Sukuro, Terrat and Kimokowua (see Fig. 2). While phone ownership is common throughout these areas, phone-use varies widely due to patchy cellular network coverage and unreliable access to electricity.

4. Methods

Qualitative methods of data collection and analysis were used to address each research question. This study relied primarily on semi-structured group and stakeholder interviews that were conducted in 2018.

4.1. Data collection

Qualitative methods are well-suited to examining the complex realities, challenges, opportunities, and everyday experiences of people in rural communities (Hanson, 2015). To identify: the mechanisms by which Maasai women access and use phones (RQ1); the processes of empowerment phones support or undermine (RQ2), and the processes of empowerment within women's diverse social relations (RQ3), we conducted qualitative, semi-structured group (n = 9) and stakeholder (n = 4) interviews with women in the study area over a five-week period in June-July, 2018. In the study area, group interviews are culturally appropriate and familiar to community members. They helped us to draw out women's diverse experiences and encouraged broad discussion. By contrast, individual interviews allowed us to focus much more narrowly on specific individuals' circumstances and outcomes.

Interview participants were recruited by local Maasai research assistants. They exemplified a range of lived experiences, including women of different ages, household wealth statuses, and degrees of

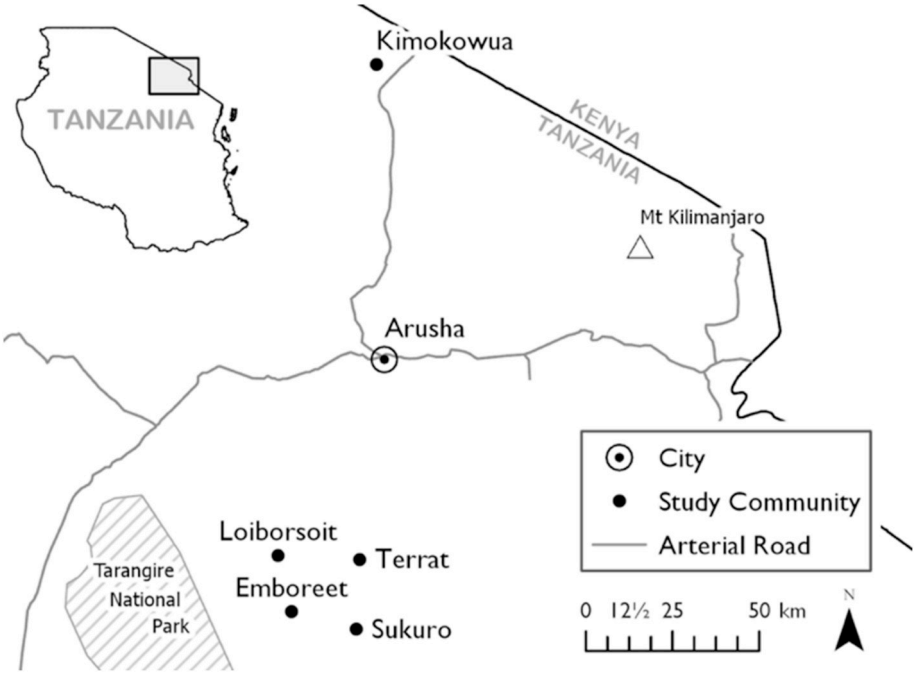

Fig. 2. Map of study area, including village centroids.

agency in the household and community. Group size ranged from three to twelve respondents for each group interview (approximately 72 women in total). Maasai female research assistants fluent in English, Swahili, and Maasai served as translators for the female researchers who conducted the women's interviews. Study participants represented the following age-groups: *Siangikin* (20–30 years, married with children), *Ndasati* (30–50 years, with grandchildren), and *Koko* (beyond reproductive age). In a few interviews, participatory research methods were used. Specifically, social network maps and a seasonal calendar, were co-produced with participants to help facilitate the conversation, validate participants' knowledge, and enhance researcher understanding (Rocheleau et al., 1996; Christie et al., 2015).

Interviews were semi-structured so that interviewers could discuss women's lived experiences, as well as their perceptions on topics associated with phones and empowerment. Specific topics included: phone access (e.g. challenges and opportunities); phone use (e.g. calling, texting, frequency, reasons for); types of communication partners (e.g. Maasai, non-Maasai, birth family, doctor, etc.); mobile money applications, other phone applications (e.g. flashlight, radio, etc.); benefits and challenges of phone use; extent of participation in household decision making; use of mobile phones in livelihood activities; intra-household relations among co-wives and husband; participation in community or marketplace spaces; and women's empowerment as conceptualized above.

While interviews with women comprise the bulk of data used for this manuscript, our research team has worked in this study area since 2005 using mixed ethnographic and survey-based methods to examine household land-use, livelihood diversification, cultural change and human well-being. During this time, we conducted groups interviews with men in 2014, 2017 and 2018 (n = 31) about a range of topics surrounding mobile-phone use including: livelihood applications, social networks, and intra-household decision-making. While these interviews did not focus specifically on women's access to phones, or social relations, they do provide some relevant insights to these topics. Where appropriate, we draw from these interviews with men for our analyses here.

4.2. Data analyses

All interview notes and transcripts were analyzed with ATLAS.ti using deductive and inductive approaches to identify themes and key causal mechanisms. Deductive coding focused on: identifying women's barriers to, and strategies for, phone access (RQ1); identifying women's perceptions of reasons for and issues from phone use (RQ1); and identifying women's processes of gaining assets, contributing to decisions, and developing autonomy (RQ2, see Fig. 1). In addition, emerging ideas and themes were tested iteratively. Inductive coding focused on: identifying how intrahousehold social position influenced resource distribution and agency, and how broader social relations influence mobile phone access and use (RQ3).

4.3. Strengths and limitations

A central limitation of this methodological approach is comparatively short amount of time in which our fieldwork was conducted. Time constraints limited the scope of this data collection. For example, in our interviews we did not focus on women's conceptualizations of empowerment itself, which would improve our study. Instead, we focused on structures, processes, proxies and assets that have commonly been associated with women's empowerment in the Global South. Also, the semi-structured nature of our interviews allowed for free-ranging discussion and expression – and yielded many insights we had not anticipated. More could also be done to compare women's and men's perspectives on women's experiences with phones. However, despite constraints, our fieldwork was bolstered by the experience of our research team, which has worked regularly in the study area since 2005, and the long-term relationships we have within the study communities, which give strong validity to our findings.

Local research assistants identified a diverse range of study participants who were available and willing to speak with us. We attempted to stratify interviews by age, and organize them so only one woman from a given household was present. However, cultural norms and logistical challenges created pressures to include other interested women who were nearby during the interview. This meant that a few interviews included co-wives and mothers-in-law, which may have undermined open conversation about some topics, especially intra-household social stratification in polygynous contexts.

This study is also a characterized by several strengths. First, it integrates diverse conceptual approaches to examine women's experiences with mobile phones in a rural, agro-pastoral context. Second, while many studies have examined women's empowerment in patriarchal contexts, very few have focused intensively on women's use of mobile phones. Third, this research recognizes intersectionality as an important characteristic of women's lives (McCall, 2005; Rocheleau et al., 1996). And lastly, it identifies and describes previously unknown dimensions of women's identities within a comparatively well-studied ethnic group.

5. Findings

Content analysis of our qualitative interviews revealed several general themes: (1) phone access is contingent on phone ownership *plus* additional resource-based, cognitive-based, and network-based assets that allow women to benefit from phones; (2) men mediate women's access to, and use of, phones by controlling assets and shaping women's intersectional identities; (3) diverse women use diverse strategies to navigate the opportunities and challenges phones provide; and (4) despite diversity, women's social relations remain comparatively homogenous. Below, we describe our findings in these areas.

5.1. Beyond ownership: phone access requires additional assets

Respondents expressed that phone ownership does not guarantee phone access. Additional resource-, cognitive-, and network-based assets are needed to bridge this gap.

5.1.1. Resource-based assets

Most women identified material assets as those that most limit their phone access. Essential materials include the handsets themselves but also SIM cards, phone vouchers (i.e., minutes), and electricity, as well as the money to purchase these resources. Women can acquire handsets in a number of ways. While a few women reported that they had purchased the phone with their own money, the majority relied on their husbands, their children, or other community members to purchase a phone for them. Regardless of whether they owned a phone or not, many respondents reported that they regularly borrowed a phone from someone in their social network, such as a husband, child, co-wife, or friend. Nonetheless, many barriers prevent women from actually using the phones they own or borrow.

SIM cards and vouchers, or credits to access network provider services, are necessary in order to benefit from phones. Many respondents had multiple SIM cards, which they rotated between depending on cellular signal, available vouchers, and service deals (e.g., promotions) (see Fig. 3). Relatedly, women described how they acquire vouchers in various ways. While many reported that they purchased their own vouchers, others noted that they receive a weekly voucher allowance from their husbands or grown sons. Some shared that they borrow vouchers directly from the service provider itself. Many described how they rely on “beeping” to communicate. This is when a person dials a number and immediately hangs up (so that the receiver gets a single ring) or sends a pre-negotiated instrumental short message service (SMS). The receiver will then know to call the person sending the

Fig. 3. Left panel; many women use multiple SIM cards; middle panel: women's phones are often dead or charging; right panel: while many phones are internet-enabled, many women often do not know how to use the internet or internet-based applications.

"beep". This cost-effective strategy is important for people who have very little credit but need to connect with someone.

Electricity is also imperative for phone use. Respondents reported that they relied on both on-grid and off-grid electricity sources to charge their phones. While very few areas in the study communities were connected to a power grid, some respondents charged their phones at village shops connected to the grid. The majority, however, relied on off-grid sources such as local shops with petrol generators or solar panels, or solar panels at their own, or nearby, *enkang*.

Many respondents noted how money was a common barrier to phone-use. Exemplifying this, one woman commented that "first is the challenge of having the money. If you don't have, then you stop communicating." Many women expressed that they did not earn enough money to support phone use and had to prioritize spending on food and other household goods or give money to their husbands. Even when money is available for phone-related costs, women can lack the time to buy vouchers or charge phones. One respondent noted that "you may go to the charge place, sometimes there [are] many phones so you have to wait … to charge. It can take a day or more." Given these types of bottlenecks, many women reported how their phones could be without charge for multiple days each week (see Fig. 3).

5.1.2. Cognitive-based assets

Women also described how it can even be difficult to learn how to use phones. Illiteracy, and low levels of education more broadly, can make calling difficult and texting unfeasible. For some women, phone use can center on basic applications like the radio, calculator, flashlight, and camera. And while many women owned internet-capable phones, most were unaware and/or lacked the technical literacy to use internet-based applications like Facebook and WhatsApp (see Fig. 3). Nonetheless women reported that, despite various challenges, and regardless of their education level, many used memory cards for music and videos, and mobile money services (e.g., M-Pesa or Airtel Money), which allow users to monitor accounts and transfer money through a phone-based application. Relatedly, respondents shared that they learned how to use the phone through their social networks.

5.1.3. Network-based assets

Unsurprisingly, women rely on their social networks in many ways to access and use phones. Respondents shared that they often rely on others to help them access and use phones, including their husbands, co-wives, mothers-in-law, neighbors, children, friends, or birth families. As noted above, women without vouchers can borrow them from the phone company or "beep" others to communicate. Women also discussed how some rely on their children or friends to translate and write text messages. Others have learned how to use various applications from friends. But while social relationships have been essential for helping many women to access phones, relations, especially with men, can also inhibit access.

5.2. Men are gatekeepers to phone access and use; shape intersectional identities

Across our interviews, women highlighted men as barriers to phone access. Specifically, men have the power in Maasai society to control assets and household norms. At the household-level especially, men can exhibit strong authority over resource distribution and decision-making, and even the social positioning of others in the household. Women shared how different husbands shape the experiences of their wives. Some men permit or even support their wives' access and use of phones while others prohibit them. One respondent described the relations between husband and wives in terms of cooperation and working together, or *maape tenebo*. "[We] like how other tribes and cultures cooperate and make decisions together, but [we] don't have that … [We] need cooperation with a man and instead of a man saying, 'you don't even have a cow.' A man can give *maape tenebo*."

5.2.1. Men mediate resource access

Women communicated that men mediate access to the resources women need to use phones. Most women reported that they did not control phone access and use but were instead beholden to the men in their social networks. While some indicated that they were able to purchase phones for themselves, the majority of respondents received them from husbands or adult sons. Some women did not feel they truly owned their phones, even if they bought them. Instead, they felt that their husbands had ultimate control over their phones. In this way, phone access is not only subject to the availability of essential resources, but to the husband's discretion.

The implications of this were expressed in various ways. One woman noted that "it can take months or years" to receive a phone from a husband. Another described how her husband said that she "should not use the phone." Some women expressed fear that their husbands would check their phones for suspicious activity, or take them away during a quarrel. To keep their phones safe, some women give them to sons or other family members so that they would not be confiscated by discontented husbands.

Many women shared how they both expected and accepted that their husbands would regularly review their phone messages looking for unfamiliar numbers. They explained that punishments for speaking to someone whom the husband did not know or approve of could include losing the phone or even getting beaten. "Others get a mobile phone from their husband, but then he takes it away from her because he found a new number." One woman described how her husband beat her when she first got a phone and asked why she bought it. Some respondents without phones reported that they had had phones previously but they had been broken, stolen, or taken away. And for women who had lost phones given to them by husbands, several shared that they were afraid to ask for a replacement.

5.2.2. Men shape women's intersectional identities

Men's influence in the household more broadly also affects women's access to phones. Women described how men can determine the rights and responsibilities for household members, creating inequalities between them. Respondents noted that in many households, the husband decides which wives will receive sugar, which will contribute to livestock healthcare fees, which children will go to school, and which wives he will consult for household decisions. Women described how every family is different, but it is the husbands' role to decide how resources are distributed and who can contribute to decisions. One respondent noted that "there are families where men make decisions on their own and families where they jointly make decisions. Some women are involved and some women are not." Women expressed frustration at this situation, with one commenting that women "do not own anything - no cows, goats, or anything. [We] do not own a farm or maize - can't do anything without telling the husband first. [Women] must inform husbands if [they] do anything like go to the market. If they don't, they will be punished. Men are free without asking for permission."

An important example of husbands' influence in the household involves how favoritism contributes to inequalities in women's access to resources and participation in household decisions. Within a household, wives can have certain positions, or rankings, which are shaped by societal norms and determined by husbands. Whether there are two wives or ten, women described that there is a favorite wife, the *endida*, and a least favorite wife, the *endingi*. The *endida*, who can be - but is not necessarily - the newest and youngest wife, is the husband's "beloved one" who receives special treatment from her husband including more domestic supplies, food, and phone vouchers than other household wives. However, as the favorite, she faces much greater oversight by the husband. Respondents shared that husbands are more likely to check and take away phones for *ndidai* (plural of *endida*) than other wives. And in order to not upset their husbands, *ndidai* may elect not to push boundaries by traveling far outside the household, pursuing income-generating activities, participating in community groups, or talking to new people without their husbands' permission.

In contrast, respondents noted that other wives, especially *endingin* (plural of *endingi),* tend to exhibit greater autonomy. As the least favorites, *endingin* do not worry about upsetting their husbands or asking for permission. As such, *endingin* can own phones, talk to whomever they want, and participate in business and community groups generally without husbands interfering. A social network map of a self-identified *endingi* illustrates how she is engaged in more community groups and business activities compared to another wife (see Fig. 4). While other factors, such as age or education, may contribute to greater autonomy and community engagement for *endingin*, respondents stated clearly that *endingin* do not worry what husbands think about them or their activities. Importantly, however, greater autonomy doesn't necessarily mean that an *endingi* will pursue activities that increase her access to resources. And while respondents could easily characterize the differences between *ndidai* and *endingin*, descriptions of the lived experiences for other wives varied. Notably, many women described *ndidai* as manipulative women who did not want to help other wives in the household. Unsurprisingly, no respondents admitted to being an *endida* but some were open to claim their titles as *endingin*.

Even as respondents highlighted the ways that husbands mediate phone access, they also expressed how each husband is different. Women widely reported that though some forbid phone use, other husbands encourage it. And while this study did not focus on the drivers of men's behaviors, some believed that education and peer-pressure play important roles. One woman commented that if a man is known to extend freedoms to his wife, other men may criticize him saying that the woman has control over him. "An uneducated man will submit and change due to credibility with friends. An educated man keeps quiet." But others saw that education helped men to have more control over women. As one woman described, "the educated are the ones searching the phone." Respondents also described how older husbands were less likely to provide, check, and confiscate phones, while younger and more educated husbands were more likely to.

5.3. Diverse women have diverse strategies to overcome barriers

To overcome the various obstacles described above, women shared how they have developed numerous strategies to access and use mobile phones.

5.3.1. Resource variability

To manage resource variability, especially related to limited funds, some women engage in small, independent income-generating activities beyond their normal responsibilities. As respondents explained, money is essential to purchase the materials needed to communicate with a phone, and having a small business is a way to make, and control, money. One woman noted that "even if the husband is harsh, women can find income generating activities." These small businesses can involve selling a range of items, including: milk, chickens, eggs, homemade jewelry, sugar, soda, tea, other domestic goods, and even agricultural products. Also, some women own small solar units and can make money by charging neighbors' phones. Other respondents described how they make extra money working on local farms or cutting grass. In these ways women can reduce their dependence on their husbands. One woman noted that "there is struggling as a woman - but if [women] do business, they feel stronger because they have capital." With extra money, women "can purchase stuff like school supplies and pens for the children."

Women who had small businesses also identified limitations. They shared that wives within the same household typically engage in different businesses, effectively limiting opportunities for each other. Seasonal fluctuations can also affect income. Respondents noted that income is typically highest from March to July between the rainy and dry seasons. This is when women have money to allocate towards business activities, phone vouchers, electricity, school fees, and other household items. Conversely, during the driest months of the year, from September and December, women are especially constrained because they are not able to make money selling milk. As one respondent described, "the livestock is skinny and there is no market for livestock" and thus little money is exchanged throughout the community. Unsurprisingly, pregnancy and infant care were also presented as barriers to engaging in small business activities.

Another strategy to gain access to financial resources is to participate in community groups, especially savings and loan groups. Respondents described three primary types of associations that women were active in: livestock groups, village-community banks, and merry-

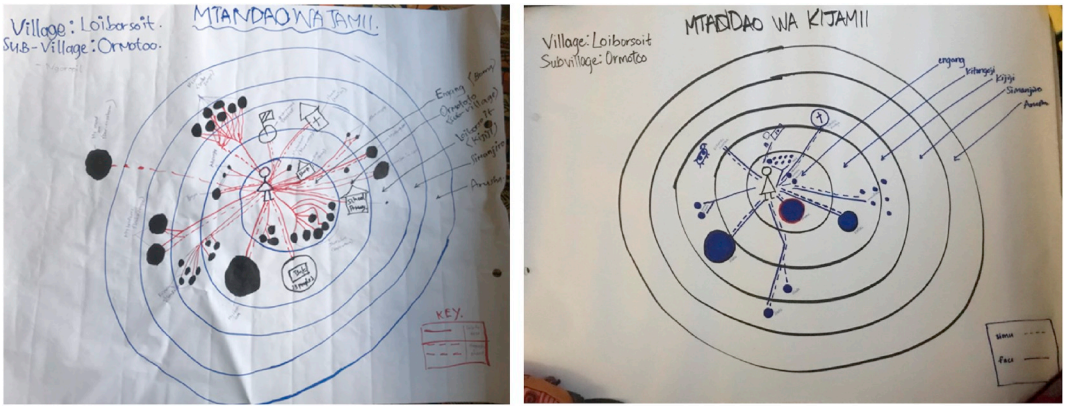

Fig. 4. Left panel: participatory social network map for self-described endingi; right panel: participatory social network map for less connected woman (exemplary of how respondents described hypothetical network for an endida).

go-rounds. Livestock groups, commonly called *kikundi cha mifugo*, are a type of cooperative where a small group of women contribute money to purchase young livestock (typically calves or kids), raise them together, and share the profits when the grown animals are sold. Village community banks, or *vicoba,* are formal savings groups that can have both male and female members. Merry-go-rounds, called *kibati*, are a type of informal *vicoba* where small groups of friends or neighbors, typically all women, contribute money to a savings fund each week and take the money on a rotational basis. Respondents noted that these groups allow women to engage in activities outside of the household and develop business relationships, especially with other women.

5.3.2. Managing controlling husbands

Respondents also described strategies to manage the challenges associated with controlling husbands. Women can elect not to answer the phone if it rings when husbands are around, instead claiming that the "network is bad," a particularly effective strategy with uneducated husbands we were told. They can hide their phones so husbands are not able to confiscate them. Some simply ignore their husbands' demands and use their phones as they like. Women with husbands who have taken their phones or prevented them from getting one can borrow phones from friends or neighbors. However, we learned that social position in the house (described above) can affect whether or not a woman would go against her husband's wishes. Some respondents shared their willingness to disregard their husbands, but others were not willing or able to do so.

5.4. Women's social relations remain homogenous

Through our interviews, we also learned how women generally use phones (or don't) and what new opportunities and challenges phones have presented. As could be expected, women's experiences vary. Many respondents, however, stated that they use phones primarily to maintain *existing* relationships, typically with other Maasai women, and manage *familiar* challenges. Far fewer reported using phones to engage in *new* relationships and activities suggestive of empowerment. Women, however, also described new challenges for existing relationships and growing addiction to phones.

5.4.1. Relationships and challenges

Despite the opportunities phones provide to communicate with many different types of people, women reported that they primarily use phones to maintain existing relationships. While they also described how they use phones to connect with certain strangers, especially health workers, taxi drivers, and school teachers, women really valued communicating with friends, family, and community members. Those who owned phones reported feeling especially close to friends who also owned phones because they could talk every day. Women also shared how important phones are for helping them to stay close with their birth families, whom they rarely visit once they have married and moved to be with their husbands' families, as Maasai tradition prescribes.

Women described how they use phones to tap largely familiar social networks to manage challenges. When finances are a problem, they can call brothers or sons to ask for money. Some receive remittances through mobile-money applications from husbands working outside the village. Respondents also noted that they use phones to call around to neighbors to help find lost livestock. Others mentioned using phones to exchange gifts with friends and even transact small loans. One respondent described how this can help women to navigate controlling husbands: "If [a woman] needs something, [she] can ring for a loan without bothering the husband. If she needs a lot of money, she will tell the husband. If she needs a little money, she doesn't need to tell the husband."

While many respondents noted how phones can help manage challenges, far fewer described how they use phones to seize new opportunities. Most women we spoke with claimed that they *did not* use phones in their business activities, though a few did report using them to communicate with business partners or clients. Some women also shared how they use phones to participate in community groups, especially if they have to miss a meeting. And in one group interview, women discussed how they sometimes use phones to call friends and discuss development ideas about how to improve their communities and their lives.

Notably, respondents did not view phones as tools to help develop new relationships. Most shared that they only talk with people they know well and only save phone numbers of relatives and close friends. When we asked if they speak to non-Maasai on the phone, many respondents laughed, saying that they never talk to non-Maasai. Others noted that they can use phones to talk to non-Maasai doctors, church leaders, or teachers whom they have already met face-to-face. Women were also adamant about not speaking to men who weren't their husbands or family members, especially on the phone.

5.4.2. Addiction and damaged relationships

Respondents also described negative issues associated with phone use. Several noted that women can become "addicted" to their phones. "Sometimes people are addicted to their phones so when the charge is getting low, they are becoming disappointed." While addiction was described as a relevant issue for all women, some respondents believed that phones have created the most turmoil for young girls still in school. One respondent described how some girls use phones to communicate with men and may ultimately drop out of school to develop relationships with them. And many commented on the roles that phones can

play in breaking relationships apart. Specifically, women saw how phones can ruin marital relationships and break families apart when husbands check wives' phones and find numbers they don't recognize.

5.5. Men's perspectives on women's phones and identities

Our interviews with men about their experiences with phones reveal several points of alignment with women's experiences. Like women, men also described the challenges they face using multiple SIMs, keeping their phones charged, paying for vouchers, and working through the constraints that illiteracy poses. Men also noted that women often gain access to phones through the men in their life, especially their husbands or brothers. And they described how some men are quite controlling of women, while others are less so. In these cases, men's and women's reports are consistent with each other. One divergent example we heard multiple times when we asked men about new challenges associated with phones is that women use them to facilitate extra-marital affairs. We were told that these have a long history in Maasai society, but that phones have greatly helped women to communicate and coordinate with lovers. It was in this context that respondents described how they check women's phones. One group described how divorce among Maasai is quite rare, but they imagine more is coming. Relatedly, men discussed *ndidai* and *endingin* with language that tended to place the onus on women and obfuscate their own roles. In one meeting, *endingin* were described as women who "mistreat" their husbands by using harsh words, being dirty, refusing to cook for them, wandering from home, and baring children with other men. By contrast, *ndidai* were said to care for their husbands and children, say "sweet" words, always stay at home, and keep the fire lit.

6. Discussion

Our findings can be seen in terms of several themes related to women's experiences with phones, as well as related processes of empowerment and disempowerment. Importantly, they show that Maasai women's access and use of mobile phones are not independent of men. In our discussion below, we organize this observation and our related findings through five ideas we believe contribute to the literatures on mobile phones, intersectionality, and women's empowerment in rural, agro-pastoral contexts: (1) phone access for women is fluid (RQ1); (2) multiple pathways exist between phone access and empowerment (RQ2); (3) existing inequalities can be reinforced by men's control of women's phones (RQ3); (4) women's identities are intersectional (RQ3); and (5) women's social networks remain homogenous (RQ3).

6.1. Access is fluid

Phone access for women in our study is fluid. Specifically, certain environmental (e.g., seasonality), infrastructural (e.g., electricity) and identity (e.g., gender) characteristics create an environment where phone accessibility ebbs and flows and is ultimately unreliable. Men's control over women's phones especially undermines women's stable access to this technology. Many women rely on their husbands or sons to provide material resources and each woman relies on her husband's consent to use a phone without fear of punishment. A husband may forbid his wife from communicating with people he does not know and confiscate her phone if she transgresses. Alternatively, a husband may allow his wife to communicate widely for business activities and provide her with needed phone vouchers. This dependency on men creates real uncertainty surrounding phone access for women.

While some Maasai women have more controlling husbands than others, all women struggle to keep their phones charged and loaded with vouchers, each of which require money. As they negotiate competing pressures within the household, especially surrounding their husbands, other household members, resource availability, and their own personal choices, women must continually strategize how to access and use phones. They may have the funds to support phone use, but need to divert them to child or livestock healthcare expenses unexpectedly. Social relationships, which can support access to resources, also introduce inconsistencies. Dependence on others creates vulnerabilities. If the friends, children, or brothers on whom women rely to read SMS or provide vouchers fail to do so, for whatever reason, women must find another way or go without.

The ubiquitous SLA framework, which maintains that as people access various capitals they gain the tools for empowerment (Scoones, 1998), fails to account for the reality that access to important technologies may be fluid. Phones, and the resources to support them, may be available one day and unavailable the next. This study highlights this fluidity as well as the prospect that it can be driven by gendered power imbalances. Empowerment frameworks themselves emphasize the dynamic nature of power and how this affects opportunities and resources for women (Mosedale, 2003). And while Duncombe's adaptations of SLA to studies of ICTs (2014) are helpful and served our study well, future studies of sustainable livelihoods would benefit from greater attention to the fluid nature of resources.

6.2. Multiple empowerment/disempowerment pathways exist

The relationships between phone access and empowerment are diverse. Our findings suggest that access does not necessarily lead to empowerment and becoming more empowered does not necessarily support greater phone access. For these Maasai communities, phones have not transformed diverse gender relations but have, perhaps more accurately, become subject to them. Notably, phones have helped some women to gain power and others to lose it, but neither gains nor losses are fixed. As respondents shared, some women have exercised ongoing agency to communicate widely with phones, while others have learned to use phones only to have them stripped away. Some women may connect with people (e.g., teachers) outside their region, while others lack the simple freedom to move beyond the homestead. And while some women appear to use phones to challenge patriarchal norms (e.g., flouting communication norms, starting businesses, etc.), others accept the status quo. As such, these findings align with studies that have found benefits for women from phones (Hilbert, 2011; Onyejekwe, 2011) and also with those that have argued that phones are gendered (Wyche and Olson, 2018) or questioned the transformative power of phones (Cummings and O'Neil, 2015).

Women's diverse experiences highlight how the relationships between phones and empowerment are shaped by personal choices and enduring social relations (Huis et al., 2017; Batliwala, 2007; Gigler, 2004). Phones may improve access to resources for some women even while the underlying structure of gender relations remains in place within the household, community, and wider society, findings that are aligned with other studies (Wyche and Olson, 2018). For women to become more evenly empowered, norms must be challenged across scales in both private and public spheres. And while phones may provide women with new tools to challenge patriarchal norms, long-standing institutional barriers remain.

6.3. Phones can reinforce inequalities

Men use women's phones as both rewards and punishments in ways that reinforce existing gender inequalities. Phones can thus be seen simply as new platforms where power is demonstrated and contested. A husband can reward his wife for good behavior by granting her access to a phone – or he can punish her for bad behavior by taking the phone away. Often women without phones must beg their husbands or ask others in their networks to use phones. These dynamics surrounding access also affect how women use phones. Wives may elect not to push boundaries out of fear that their husbands will punish them.

Importantly, phones may be spawning new inequalities between women – a finding aligned with other research (Wyche et al., 2016).

Some women use phones to challenge their husbands' authority. As the least-favorite wives, *endingin*, may use phones in spite of their husbands' wishes. Other wives may simply use their phones in secret to quietly challenge patriarchal norms. But many do nothing. Also, men vary – with some using women's phones as instruments of control and others supporting their wives' access and use without conditions. Differences here may be associated with men's age and education in ways that may, or may not, be counter-intuitive. More research here is needed. And just as men differ – so do women. The SRA framework (Kabeer, 1994, 2005) we use here to examine gendered inequalities frames women as a homogenous group – but our findings suggest that women's heterogeneity is also important.

6.4. Women's identities are intersectional

Maasai women have intersecting identities – a reality that undermines simple categorical examinations of gender dynamics. Furthermore, this intersectionality affects individuals' access to resources (esp. phones) and pathways to empowerment (Pradhan et al., 2019). Consistent with Hodgson's work in Maasai communities (2005, 2001), our study illustrates how inequalities exist between and among women of different ages, ethnicities, and education-levels. Even their sons' social positions affect women's identities and positions. With phones, older, illiterate women face challenges that younger, educated women do not. Non-Maasai women who marry into Maasai households can be viewed, and treated, differently than other wives, with attending consequences for their social networks and phone use. And both the number and social statuses of women's sons shape what resources women can have access to, with high-status sons conferring more benefits.

Our study also highlights how intra-household favoritism affects the relationship between phone access and power. As Yurco (2018) notes, intra-household dynamics demonstrate the complexities in the negotiation of power in polygynous communities. Favoritism in polygynous relationships creates structures of power, governed by men but wielded by men and women alike, wherein women with power can disempower other women. Endowed with a higher social position by her husband, an *endida*, has the power to influence her husband and secure greater access to resources than her co-wives. However, these benefits are exchanged for autonomy. She may lose freedoms of movement, communication, and community participation – benefits an *endingi* can reap. Some *endingin* may leverage this autonomy to partake in income-generating activities or community groups that increase their access to various resources (though community groups may also reproduce gender stereotypes (see Mudege et al., 2015)). These negotiations of power flux as women's positions shift. Curiously, much has been written about the diversification of livelihoods in this context, but not the diversity of lives. Recognizing this, Hoan et al. (2016) emphasized that attention to intersectionality must be included in ICT development interventions for women's empowerment. Our findings lead us to agree that generalizing women fails to account for differences in the way individuals are embedded in social structures and therefore experience new technologies.

6.5. Women's networks remain homogenous

Lastly, our findings show that women primarily use phones to maintain and strengthen existing relationships, but not to create new ones, observations consistent with others' (Donner and Escobari, 2010). Respondents described how they use them to communicate with their husbands and children, parents and siblings, friends and neighbors, most of whom are Maasai. In these cases, phones provide new opportunities for women to strengthen ties within familiar, relatively homogenous social networks, which can offer strong bonding social capital (Patulny and Lind Haase Svendsen, 2007). Rooted in kinship, friendship, and community, homogenous networks, are especially good for helping people manage unforeseen challenges (Putnam, 2000). Respondents described how they often used phones to request resources or assistance from their social networks in order to manage their traditional roles and responsibilities in the household. Conversely, very few women described using phones to connect with new types of people (i.e., people from different ethnic backgrounds and geographic locations, who have different skills and engage in different economic activities, etc.) who may offer bridging social capital, including diverse perspectives and ideas, as well as tips on new opportunities that can challenge the status quo.

Our findings contrast somewhat with studies of Maasai and other pastoralists groups, which have found that men are diversifying their social networks (Baird and Hartter, 2017; Butt, 2015) and using phones to communicate across marketplaces (Djohy et al., 2017; Msuya and Annake, 2013; Debsu et al., 2016). Future research should examine whether men's expanding networks and new experiences are affecting their perceptions of gender dynamics. Perhaps men's experiences are helping them to consolidate power and undermine social change or, alternatively, see and treat women in more egalitarian ways.

7. Conclusion

Our goal here has been to examine how women access and use mobile phones within a patriarchal and agro-pastoralist context – and how phones may be associated with processes of women's empowerment. Towards this goal, we adapted rural livelihoods (Chambers and Conway, 1991; Duncombe, 2014) and social relations (Kabeer, 1994) frameworks to identify how social relations, especially, affect women's challenges and opportunities surrounding phone access and use. At their core, mobile phones are simply tools that can provide access to information and opportunities for communication (Kirkman, 1999). And while phones may disrupt how men and women negotiate power, the evolution of entrenched gender inequalities depends on how individual men and women leverage these tools. Our findings lead us to the following conclusions: (1) men are the gatekeepers to women's phone use; (2) women face individual challenges and opportunities; and (3) phones are new tools within a context that variably empowers and disempowers women.

Our study illustrates how men are central to negotiations of women's power. Whether men are benevolent gatekeepers or not, gatekeepers they remain. While new technologies like mobile phones may seem like tools for women everywhere to empower themselves, they may be better viewed as new arenas wherein gendered power struggles play out. Given the longstanding cultural norms in Maasai society surrounding men's and women's social relations, future strategies to involve men in women's empowerment may yield greater results for women than strategies that do not.

We also find that the simple dichotomy between men and women, which is used uncritically in much development work, obfuscates important differences between women (Runyan, 2018; Djoudi et al., 2016). Wives within the same household can have very different identities and face different challenges and opportunities, which shape the negotiations of power between husbands and wives - and between co-wives. Much more can be done to understand how intersectionality in this and other developing contexts affects individuals' prospects for empowerment.

Ultimately, mobile phones do not empower women. Empowerment is contingent. Phones may be used, either by women or men, to empower or disempower women. And phones may even be used to help empower the same woman in some ways (or at some times) and disempower her in others. This study describes how both intra-household and inter-household social relations can strongly affect the relationship between mobile phones and women's empowerment. Future efforts to leverage mobile technologies for development should first endeavor to understand local conceptions of empowerment, and existing social relations. Notably, this recommendation undermines the potential

scalability of many positive mobile strategies, but correspondingly offers a barrier against the diffusion of unintended consequences.

CRediT authorship contribution statement

Kelly H. Summers: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing - original draft. **Timothy D. Baird:** Conceptualization, Methodology, Formal analysis, Investigation, Writing - review & editing, Project administration, Funding acquisition. **Emily Woodhouse:** Conceptualization, Methodology, Investigation, Writing - review & editing, Funding acquisition. **Maria Elisa Christie:** Conceptualization, Methodology, Writing - review & editing. **J. Terrence McCabe:** Conceptualization, Methodology, Investigation, Writing - review & editing, Funding acquisition. **Felista Terta:** Investigation, Project administration. **Naomi Peter:** Investigation, Project administration.

Declaration of competing interest

None.

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