

Degrees of Sharing: Proximate Media Sharing and Messaging by Young People in Khayelitsha

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This paper explores the phone and mobile media sharing relationships of a group of young mobile phone users in Khayelitsha, South Africa. Intensive sharing took place within peer and intimate relationships, while resource sharing characterized relationships with a more extensive circle, including members of the older generation. Phones were kept open to others to avoid inferences of stinginess, disrespect, or secretiveness and the use of privacy features (such as passwords) was complicated by conflicts between an ethos of mutual support and the protection of individual property and privacy. Collocated phone use trumped online sharing but media on phones constituted public personae similar to social media ‘profiles’. Proximate sharing within close relationships allowed social display, relationship-building and deference to authority. We suggest changes to current file-based interfaces for Bluetooth pairing, media ‘galleries’, and peer-to-peer text communication to better support such proximate exchanges of media and messaging.

Author Keywords

Mobile phone sharing; privacy; security; Bluetooth; mobile media; mobile photography.

ACM Classification Keywords

H.5.3 User Interface; user centered design.

INTRODUCTION

Mobile phones are central artifacts of global youth culture [5]. For many young people in developed countries, smartphones are fully-fledged channels of sociality and ‘networked individualism’[31]. In such contexts, phones extend practices of media use and participation that rely on affordable Internet access and extensive use of computers [10]. This paper explores how mobile media supports sociality among young people in Makhaza, Khayelitsha, in South Africa. Here phones are often shared and computers are scarce. Despite the availability of mobile Internet access, airtime is expensive and so free methods of ‘peripheral networking’ such as Bluetooth transfers or

cheap instant messaging via MXit are popular [13, 29]. Like phone users in Bangalore [23] and other contexts of low income use, young people in Makhaza find ingenious uses for Bluetooth as interface for mobile entertainment and peer-to-peer sharing.

In this paper we introduce a group of twenty young people from Makhaza and explore their use of Nokia feature phones for media sharing. In this context, phones are often semi-public shared resources, and this creates a mismatch with the default values embodied in phone designs and interfaces. The research was driven by a desire to understand how well current mobile devices met the needs of this new group of users and whether existing handset designs could better support their needs. The study was conducted in two phases; phase one studied existing practices whilst phase two introduced new handsets with a more extensive range of features.

Whilst current handset designs do not necessarily assume that a handset is used by only one individual, they do make several questionable assumptions when considered in the light of young people’s practices. First, measures creating individual privacy are assumed to be socially desirable (as metaphors such as ‘protection’ or ‘security’ reveal), rather than potentially creating conflict or signaling an anti-social refusal to share, or an admission of something to hide. Second, proximate networking via Bluetooth is primarily represented as file transfer between devices and not as a channel for interpersonal messaging. These assumptions did not always hold for the participants in this study, and in fact the designs of devices sometimes actively obstructed use.

Sharing phones

Initial research into mobile phone use in developed countries led researchers to believe that, unlike landlines, which are often shared in domestic contexts, mobile phones play an individualising role [12]. Studies of young people’s phone use later revealed intricate sharing and ritual exchanges being used to demonstrate status and rivalry as well as affiliation [26]. Around the world, young people share phone conversations between co-present friends [30], include absent participants in a social gathering [9], and use shared cameraphone images to extend everyday self-authoring into an ambient awareness of absent intimates [17]. Smartphone use has become mainstream among

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middle class adults, encouraging media display and sharing and requiring more nuanced models of privacy [11]. Features such as rapid access to 'guest' profiles or sensor-activated spheres have been suggested to support privacy or data security [20],[11]. File-sharing or media 'trafficking' practices support various social interactions [8].

Researchers working outside affluent Northern contexts noticed equally complex practices of proximate and distant sharing in developing countries [25]. For impoverished families using a single phone, shared access often overrides mobility and convenience [28]. The complex dynamics of sharing arrangements suggest that, even under circumstances of poverty, 'sharing is not simply a response to scarcity' [3]. Even where phones are initially adopted by individuals, communities (such as fisherfolk in Kerala) may later appropriate them by establishing new modes of cooperation [24]. Such sharing practices are not evidence of undifferentiated or utopian communalism, since a range of important distinctions and power relationships can underlie roles of purchase, ownership, access and control [3]. In Uganda, local anxieties about the 'secrets' in phones and the influence of familial hierarchies and values play an important role in the 'moral economy' [21] into which phones are incorporated, often excluding women from sharing [3]. Finally, studies of cyberbullying in South Africa have shown the prevalence of practices such as 'trickery', where deception leads to the revelation of shared secrets or images, 'outing', where they are passed on to people with whom they were not intended to be shared, or ostracism, when young people are hurtfully excluded from the shared spaces of their peers [4, 27]. This study investigates the pressures on sharing which arise in a South African context when the (often asymmetrical) obligations and conveniences of sharing in families and low income neighbourhoods intersect with the pleasures, status and pressures associated with young people's media sharing in intimate relationships and peer groups. Reliance on free collocated media sharing on phones (rather than social network sites) creates more complex needs for nuanced models of sharing and privacy as dynamic continua.

METHODS

Research site – Makhaza, Khayelitsha

Khayelitsha is a large, generally low-income settlement on the urban periphery of Cape Town. Mobile communication is used extensively here to create social, economic and symbolic capital which helps maintain and support households and social networks encompassing other parts of Cape Town and rural homesteads in the Eastern Cape [22]. Young people in this area were early adopters of mobile-centric [13] Internet, primarily for cheap instant messaging [7]. Like many residents of Khayelitsha, the participants in this study experienced chronic insecurity because of high crime rates, and their mobile phones were often targeted in petty theft and more serious crimes.

Study participants - the video producers

Study participants were a group of twenty young people (ages fifteen to eighteen) who attended an after-school program run by a non-profit youth development organization in Makhaza. In the role of participant observer, one of the researchers, Silke Haßreiter, offered an optional six month course in mobile video production to this group during June to November in 2010. All those attending the course were also invited to participate in the research (subject to parental consent). Names are anonymised throughout to protect privacy.

Interviews and video production

In-depth interviews were conducted at the start and end of the project. The first phase of the project documented the research participants' existing mobile phone and mobile media use, focusing on production and exchange of visual media such as photos and videos. The second phase of the project introduced twenty Nokia feature phone handsets, the Nokia 5530 and Nokia X3 (chosen for their multimedia and data capabilities) which were donated to the organisation for use by the twenty video producers, and became the property of the organisation at the end of the project. While using the phones to make their videos for class, these young people had fulltime use of the handsets, storing media on them and customising them extensively. This helped us understand their media-sharing practices on a relatively high-end handset.

Mind maps of close relationships

The video producers were also asked to complete a network diagram (or 'mind map') of their seven closest relationships. These ego-centric network diagrams included a total of 133 relationships with alters. The participants answered twenty three questions about their phone and media-sharing in each relationship, including the directionality of the sharing (giving or receiving) in each case. The total number of affirmative answers was used as a 'sharing score' (Figure 1). A high score suggests that the relationship is characterized by a wide range of sharing practices or intensive sharing. We did not attempt to measure to what extent or how frequently sharing happened. Alters were categorized according to their relationship with the participant and mean sharing scores determined for each type of relationship (Figure 2). The percentage of all relationships in which specific phone features and media were shared served as a 'sharability score' for that feature or media type (Figure 2).

Phone content analysis

At the end of each phase of the project, participants were asked whether they wanted to give the researchers copies of the media stored on their phones. A total of 2125 images were collected and the content of filenames and images was coded and analysed. Not all participants chose to share, and some elected to delete media which was considered private.

Questionnaire

A questionnaire investigating technology access, mobile media usage, and phone sharing was completed by a larger convenience sample (N=46) of 32 young women and fourteen young men. This group included the twenty video producers as well as older teens from the same after-school program.

FINDINGS

Technology and mobile media use

According to questionnaire responses of the larger group (N=46) only a small minority owned a desktop computer (13%) or laptop (4%). Almost all (94%) owned a mobile phone and many (40%) also shared someone else's phone. Almost all (94%) reported that they felt safe using their phones at home, while only a very small number felt safe using phones at school (6%), on the street (2%) or in public transport (2%).

Overall, 77% of participants had taken a photo or video with a cellphone on the previous day. Almost as many (73%) said that they had used Bluetooth to share a photo, music or video. By contrast, only 27% had downloaded media from the Internet using a computer. The majority had access to the mobile Internet (64%), and 30% reported that they used phones and computers equally often to access the Internet. The group were active on Facebook and MXit (a South African mobile chat service).

Cost-saving strategies

Almost half of the survey participants reported that they 'never' or 'rarely' made voice calls. The cost-saving strategy of missed calls or 'buzzing' [6] was used several times per day by about a third, while considerably cheaper MXit messaging was preferred to SMS. Most sent free 'please call me' messages frequently (57% sent them 'several times a day'). In interviews, participants explained how these strategies helped them get by on limited airtime of about R5 (\$ 0,71) to R15 (\$ 2,14) per week. This was not enough to call, send text messages or even to spend much time on the mobile Internet.

Financial constraints also necessitated a great deal of SIM swapping (to share airtime or media). SIM swapping was hampered by tiny flaps and participants used objects such as feathers or sticks to pry open the flaps. This sometimes damaged the handsets.

Despite the social status of the 5530 and the X3 phones, few participants made extensive use of all the phone's features because, while online activities were easy and accessible, they were also a drain on finances. For example, Lerato (f, 17) used school lunch money to buy the extra airtime needed to pay for her increased Internet use.

Shared images

Images collected from handsets reveal certain media sharing practices which took place between the twenty

video producers. Interconnections between their individual collections of images were estimated by identifying the number of duplicate images in the collection, (cases where the same image file appeared on more than one phone). These included 178 image files, or just over 8% of the images in the collection. In the case of the most widely shared images, duplicate files appeared in four separate collections. In most cases only two or three copies of an image appeared in the collection.

A detailed content analysis of these images is beyond the scope of this paper, but one subset of images which made up about 12% of the collection is of particular importance as shared media. Known as 'photo cards', these images were used to transfer a verbal message in visual form and featured decorative and expressive uses of typefaces and other graphics. They often appeared in animated GIF format and were downloaded from WAP sites. Apart from such stock messages, custom edits and annotations were added to photos using the phones' editing functions.

While some annotations involved the addition of labels such as names and nicknames to images, others resembled status updates, witty comments, or were messages addressed to the recipient of a picture. In essence, young people were appropriating the tools on the handset to create a form of asynchronous, peer-to-peer, rich messaging service that would not incur network costs.

Sharing relationships

Network diagrams, along with the 'sharing score' for each relationship and the 'sharability' of different types of media gave us a more detailed picture of how twenty participants shared various kinds of media in their close relationships (N=133). The sharing score was broken down into scores for (i) sharing pictures, (ii) shared use of handset, airtime and other resources, (iii) sharing of passwords and PIN codes, and (iv) other sharing.

Phones were shared in more than half of the 133 close relationships documented in the network diagrams. Participants were more likely to give someone else their handset than to receive a handset from someone else, and were more likely to play games on someone else's phone than to allow someone to play their games. All other sharing relationships were roughly reciprocal.

Participants were most likely to share free phone features such as listening to music, taking pictures with the phone's camera, and looking at pictures. Cameras on phones were shared more often than any other phone feature (52%). Airtime was also highly sharable. Participants reported sharing airtime in almost half of their close relationships (49%). Photos and pictures on cellphones were shared in 50% of the relationships, games in 40%. 'Romantic and sexy' pictures were considered more private but were nonetheless shared in 38% of relationships. Pictures were shared by Bluetooth in 46% of the relationships (music was shared in 45% and videos in 41%). Images were thus

considerably more likely to be shared via Bluetooth than via MXit (34%) or Facebook (29%). In 20% of the relationships MXit and Facebook passwords or handset pin numbers were shared. SIM cards were also shared in 20% of these close relationships.

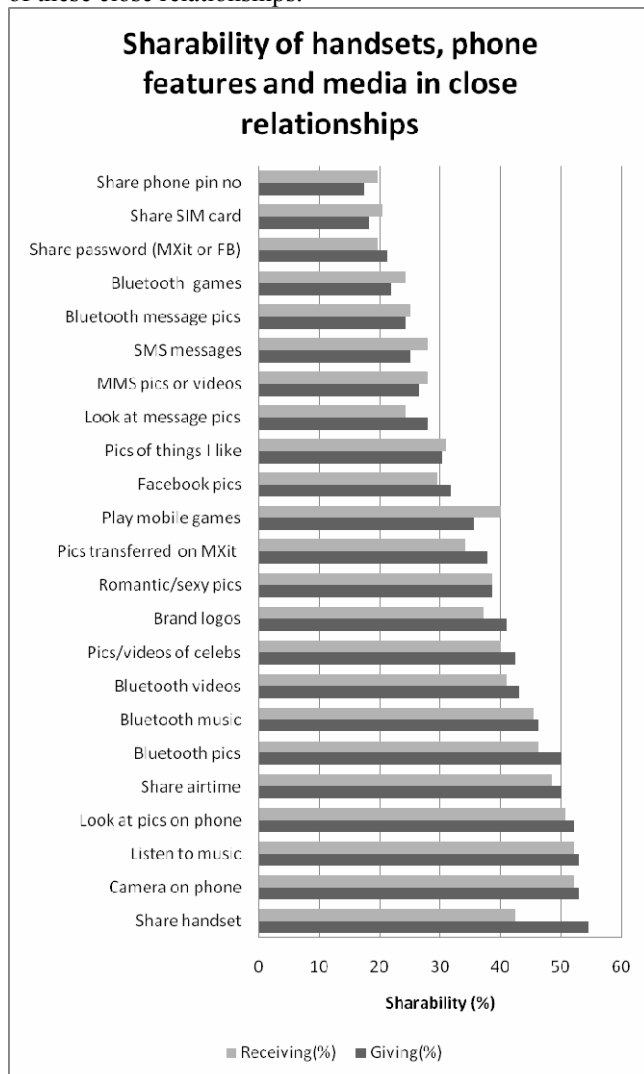


Figure 1: Sharability of media, handsets and phone features in participants' closest relationships (N=133).

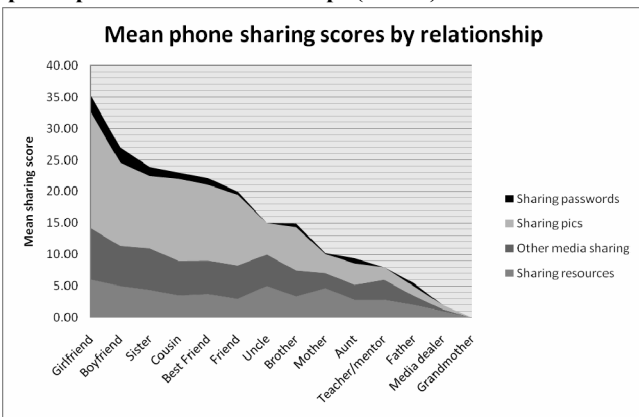


Figure 2: Scores for media and phone sharing in participants' closest relationships (N=133).

Shared resources, shared access and shared culture

Analysis of the network diagrams revealed a small negative correlation between sharing scores and age of alter [$r = -.290, n=133, p<0.01$]. High overall sharing scores were associated, to a small extent, with relationships with younger alters. There was a medium negative correlation between picture sharing scores and age of alter [$r = -.357, n=133, p<0.01$]. High picture sharing was thus associated, to a moderate extent with relationships with younger alters. There was a smaller negative correlation between presence of shared access arrangements such as shared passwords and pin codes and age of alter [$r(133) = -.179, p < 0.05$]. Shared access arrangements were associated, to a very small extent with younger alters. There was no correlation between shared use of handsets, airtime, or other resources and age of alters [$r(133) = .056, p > 0.05$] and these forms of sharing appeared in relationships with alters of all ages.

Figure 2 shows intensive sharing behaviors found most often in romantic relationships. Several male participants were outliers who reported extravagant levels of sharing in relationships with their girlfriends, who (they claimed) shared everything with them. In contrast, and particularly in relation to photo sharing, female participants reported somewhat more circumspect sharing relationships with boyfriends. Shared peer culture found expression in the relatively high levels of media sharing among peers. Passwords and pin codes were shared primarily in romantic relationships but also between siblings and friends. Shared use of resources such as airtime and handsets was reported in most of the documented relationships.

DISCUSSION

Network diagrams showed the importance of collocated media use (where two people in close spatial proximity look at the same image) and media sharing via Bluetooth in close relationships. These forms of proximate media sharing were more prevalent than media sharing via social networks such as Facebook. The existence of a relatively large number of duplicate images in the collection further indicates the importance of Bluetooth.

As found in other contexts intensive sharing cements intimate friendships or romantic relationships, semi-public display of media and friends on phones establishes status in the peer group while threatening secrets, much as social network sites do. We found that hiding secrets from adults and more distant peers is made particularly difficult in this context where mutuality is valued and resource sharing often required or expected.

Shared by default

In the first set of interviews, most young people did not initially report that they shared their phones since local norms did not even mark many everyday co-use practices as phone sharing. In fact, resource sharing took place across a range of relationships. Phones and airtime were shared

both with the older generation and with peers in extensive support networks. Peer networks were marked by intensive sharing and intimate shared access relationships. Several tensions around sharing emerged from the different social contexts associated with these networks.

Extensive sharing

These young people often lived in households with extended family. Neighborliness demanded many kinds of sharing, including childcare, taps, toilets, and consumer goods, including phones. Without suggesting that an idealized collectivism or *ubuntu* prevailed, coexistence and interdependence [16] were emphasized and an ethos of sharing and mutual support could be called upon [15], albeit at the cost of privacy. Uneasiness around sharing and privacy outlined generational and gender-based hierarchies which gave the older generation rights to access younger people's private spaces, and where media sharing had different meanings for young men and women.

Phone sharing relationships with the older generation centered around resource sharing in this context of shared support. Uncles and mothers shared most, highlighting the relative absence of fathers from this group's social networks. Airtime was considered a shared resource within most of the close relationships reported by the group.

As Bongani (m, 17) explained, when sharing, reciprocal gifts of emotional support and solidarity are expressed. These are just as important to the sharing relationship as the material or economic assistance accessed through sharing:

Sharing is very important. Because if you don't share, if you don't talk to people, you don't feel the pain of someone, if you are in trouble, no one will help you (Bongani, m, 17).

In the second set of interviews, Bongani discussed his experience of having had the new Nokia phone for three months. He commented that it was somewhat uncomfortable to allow others to pick up his phone and search through its contents:

Here people like to take your phones and search [through] them. Actually it is a private device, but here you constantly run the risk that someone picks your phone up and looks through it. That is not good. But you cannot do anything.

He accepted, though, that this form of surveillance was a cost of being able to participate in the local gift economy of phones, functionality and mobile media: *'Plus if you want to borrow a phone from someone you cannot refuse [to give] your phone to him the very next day'*.

Most participants responded to local unwritten rules and handed over their phones to others when requested. If they did not share, they were seen as being selfish, or as outsiders. Thus the default orientation towards a phone in this context was that it is a public, rather than a private artifact, available for inspection by anyone in one's circle of

acquaintances. This public status was underpinned by reciprocity, a complex and socially regulated form of gift exchange: *If you take some other person's phone, then you have to share yours too. That is law (Mandla, m, 18).*

Phones left unattended were seen as fair game. Young people had their own rules for whose phone they would pick up and inspect, in most cases saying that although they would pick up the phones of anyone they knew, even a phone belonging to one of their parents, and look at its contents; they would not do the same thing with the phone of someone they didn't know: *I don't know the person, I don't take it. (Zukiswa, f, 17)*

Intensive sharing

Other forms of sharing were found in peer networks, including intensive media sharing and intimate shared access relationships.

The intimacy of some of the intensive phone-sharing relationships is apparent from Yola and Lindelwa, who explained that they switched phones for the weekend, holidays, or when they were hanging out together after school. On the day of the interview, Lindelwa was using Yola's phone, in order to help her with a game, while Yola used MXit on Lindelwa's phone, which had more available memory than her own phone did. At other times they would simply switch SIM cards.

By creating Bluetooth connections or 'pairing' phones, young people were able to browse the media stored on their friends' handsets and select images of their friends to download and store on their own phones:

I take pictures from their phones, when they are happy and smiling, laughing. (Sibongile, f, 17)

Lindelwa explained that because Bluetooth transfers were so slow, switching phones or storage media was an easier way to share mobile video clips (recorded from television) with her good friends.

Refusal to share

In the questionnaire, participants were asked how they would respond if a friend did not want to share the media on his or her phone with them. (Responses were anonymized.) The scenario was met with disbelief in some cases: *'She is pretending, why should she not give me her phone?'* A refusal to share phones or media proved that the friendship was faulty: *'if they are friends they must share almost everything of theirs with me'*, revealed a serious lack of trust: *'they don't trust me at all and there's no friendship without trust'*. It might even call into question the relationship itself (*'I'm not really as important to her/him as I was thinking'*). Other interpretations were that the person had something shameful to hide on the phone, was jealous of the friend, or was excessively selfish. In contrast, a reciprocated sharing relationship was a source of delight, evidence of trust, love, inclusion (*'wants me to be a part of*

her life'), intimacy ('keeps us close') and the strength of the relationship with the peer ('real buddies share everything').

Legalistic perspectives might view media sharing as theft of intellectual property, but this view was not shared by participants, since their sharing did not deprive anyone else of the ability to use the resource: 'music/media is something that you can share', they explained: 'it's not eaten'.

Sharing, power, generation and gender

Sharing practices articulated with changing peer and romantic relationships, but also resonated with gender, class and consumerist hierarchies which stigmatize the signifiers of poverty [3].

For example, young people such as Bongani who did not have their own phones experienced the pressure of asymmetrical relationships which subjected them to unpleasant forms of dependency in the peer group:

When you don't have [a phone], they always look at you. [He is] boring. He does not have anything, he wants to borrow from us. (Bongani, m, 17)

Unequal relations between generations and genders meant that non-reciprocal sharing was expected from young people and young women in particular.

On the one hand, young people were expected to make their phones available for parental use and surveillance. This applied particularly to mothers and was confirmed by the high sharing scores which characterized many maternal relationships.

On the other hand, the negative correlations between age of alter and sharing suggest that pictures in general and erotic or sexual pictures in particular were kept private from the older generation. Like many of their peers [29], the young men and women who participated in our study valued Mxit and mobile phones in general as a space for romantic and sexually focused exploration and play, allowing transgression and intimacy but discreet enough to allow the maintenance of 'ukuhlonipha' (to respect), a concept which encompasses respectful relationships towards elders, involving deference, politeness and non-confrontational disagreement [2].

Consequently sharing phones with parents was particularly complex. Key complicating factors arose because intergenerational talk about sexuality and romance were taboo: 'Our parents ... don't talk about girls with us' (Mandla, m, 18).

For example, Mandla reported that when the phone drew his parents' attention to his relationship with a girlfriend (by means of the text of messages or audible message alerts from his girlfriends) he could expect recriminations and admonitions to stay away from the opposite sex and focus on schoolwork. In his experience this kind of talk was intensely uncomfortable, and being subjected to it was a

punishment in itself: 'talking about it is already horrible enough'.

The differential levels of picture sharing with boyfriends and girlfriends (see Figure 1) suggests the existence of a gender-based double standard which influences both sharing and reporting. Girlfriends who share 'too much' according to local norms lose face, while their boyfriends gain bragging rights. These gender differences are confirmed by the use of girlfriends' pictures in status games among male peers, which we discuss below.

Inconspicuous consumption

The first set of interviews reflected the fact that in this teen peer group at least, Makhaza was a roughly homogenous community with relatively egalitarian sharing relationships. These relationships were disrupted by the arrival of the Nokia feature phones. Network diagrams showed that the participants were more likely to give than to receive phones in their sharing relationships (Figure 1), possibly because of their access to the Nokia phones. Exotic and disproportionately valuable, the phones restricted certain kinds of sharing behaviors while amplifying others.

Nolizwe (17, f) pointed out that phones which did not have desirable features such as Bluetooth were less likely to be stolen. Researchers, parents, and teens were all highly aware of the risk of theft, or of being attacked for a phone, and so a good deal of time was spent discussing ways to prioritise safety and use strategies which would make the phones look older or not attract attention to their desirability. As in other South African townships, [19] the risk of theft was simply too great in many parts of Khayelitsha, with the result that these 'mobile' phones were effectively immobilized. Andile (m, 17) commented that unless he knew most of the people in a particular place he could no longer risk going there with the Nokia handset:

There are some places where I cannot go ... You have to know most of the people that are around and then you can go there.

Mandla responded to the responsibility of having to take care of the new handset by restricting the circle of people with whom he would share. He limited its use to trusted family members, such as his mother, who could use it 'as long as she wants'. He would only allow schoolmates to use the phone in his presence 'Love them all, but don't trust anyone'. At the NGO more mutual sharing relationships were possible, since he could share with others from the class who also had Nokia phones:

When they have airtime and I not, then we swap phones. He is using my new games and I use his airtime for Mxit. Like this we are both happy. (Mandla, m, 18)

Siyabulele (16, m) had a similar dilemma. His previous phone was the ubiquitous Samsung E250, which was unremarkable and yet functional, thus allowing him considerable freedom in managing sharing relationships: 'I

used to share a lot'. Now he could no longer allow his friends to use his phone in his absence. Siyabulele was concerned that one of his peers could remove the memory cards from the side of the phone: 'you don't even see it and they can steal it. So you have to trust people that you give the phone'.

Mobile profiles

Young people carefully chose and edited the content they stored on their mobile phones, managing impressions, and representing individual identities and social relations. Their major objective was to create and maintain a 'cool' image of themselves, and their overall *modus operandi* was reminiscent of how teens in other more connected and well-resourced environments created and maintained profiles on online social network sites [1]. Mobile photographs were central to self-presentation during peer interactions:

Most of the time you spend time with your friends to look at photos on your phone and to show other people what you have on your phone. And you also spend a lot of time in choosing what pics and songs that you have on your phone, because you choose your style. You choose what you want others to see about you. (Mandla, m, 18)

Bongani pointed out that phones functioned as a complex accessory signifying young people's identities, which they assembled from the various possibilities available within local youth and consumer culture:

If you have a lot of hip hop pictures on, then you are a hip hop person. When most of the pictures are from cars, then you like cars. When you have a lot of girls, then you are a playboy.

When called upon to share phones as resources in their extensive networks, young people were also sharing access to the content associated with intensive sharing relationships. Unwritten rules of sharing governed such interactions, but they were not foolproof. When giving the phone away for a longer time, the phone owner lost oversight and control of his or her device, and participants were aware that unknown people might view their phone's content while it was being used by someone else.

Just as users of social network sites intentionally place content on their profile to be seen by others [1], participants displayed certain content prominently if they felt it might enhance their status. They deleted or hid certain content which was perceived as too private.

Secrets, messaging, stealth and surveillance

Peers shared unwritten rules about managing shared phone use. It was generally agreed that messages were more private than pictures or videos. *They know that they are not allowed to look at my messages. I trust them. They would not go there. (Andile, m, 17)*

As Andile (m, 17) explained, certain images could be freely shared because of their ambiguity:

Maybe if I have two girlfriends and their photos on my phone, then I can still lie and say that is my classmate – so no problem.

Mutually agreed sharing could shift into inter-personal surveillance if the phone owner's messages were read and disputes arose if airtime was used without permission. Zukiswa (f, 17) accepted that her phone would be picked up and inspected by others (and indeed she did the same thing to others in return), despite her discomfort with such scrutiny.

The problems associated with surveillance of messages was particularly acute given the fact that the phone protects not only its owner's secrets, but also those entrusted to him or her by others:

Messages are most private. There is personal stuff, maybe someone sends something and tells me his or her problem and then there is a secret between me and him and then I don't want anyone to see it. Because then it is all over the place and everyone is talking about it and then the friend thinks I said something and I betrayed him and then we fight. Even if it happened by mistake (Siyabulele, 16, m).

A different set of pressures were apparent in relation to parental surveillance of phone content, which set up an additional audience for young people to consider. boyd [1] identifies the dilemma online teens face when their online profiles, which must be cool enough for peers, are also checked by their parents. In response, some opened a second profile or 'mirror' network. The Makhaza teens tried to create similar private spaces through PINcodes, passwords and hidden folder systems.

A few used password-protection (PIN codes) to protect certain content that was classified as too private, such as text messages, erotic pictures and videos. Lerato (17, f) said that she kept her messages and games password-protected (messages for privacy, games because excessive use quickly used up the battery). Other young people mentioned knowing friends who used passwords to protect pornographic images or videos stored on their phones. This did not mean that they would not share the protected content, but it was a way to ensure that sharing required their consent: *When someone wants to do something then they have to ask for permission (Lerato, 17, f).*

Only best friends or lovers had access to these private spaces, but passwords could backfire if discovered by someone else, since they drew attention to the fact of limitations on sharing. In a context where shared access to phones is the default *modus operandi*, an attempt to establish privacy, or to protect secrets can itself be stigmatized or considered a sign of the transgressive or shameful nature of whatever is being protected. To some extent, collectivist values are in conflict with Western notions of the 'private' and autonomous individual, whose personal integrity and information are to be protected from intrusion or surveillance, whether by the state or

corporations. According to philosophies such as *ubuntu* something 'private' might be seen as collective property appropriated by an individual rather than individual property protected from the intrusion of others [18].

Thus, in this Makhaza peer group, attempts to establish privacy were likely to be seen as attempts to maintain 'secrecy'. For example, Yolena (f 16) suggested that someone who tried to protect content with a password was suspected by peers of wanting to conceal nude images or pornography. Others said they could get into trouble for even trying to restrict their parents or other carers from seeing their mobile phone content and that a password would in itself be reason enough for punishment.

Instead, as in Bangalore [23], secret folder systems were used to hide content and create a little bit of private space. Parents didn't know about these folders and most were not savvy enough to discover the folders when scrolling through the phones in search of forbidden content. But more than half of the participants reported that most of the time they would not even take the risk. If they received mobile phone content which was too private or which might get them into trouble, they deleted it immediately.

Shared use created additional complications for a password-based security model. Security features are available to all users and so peers of Neo (m, 17) were able to use a PIN code to lock one of the memory cards on the Nokia phone he used. The only way to recover use of the card was to format it, which meant he lost all the media.

Collectors' items

Other content was hidden for different reasons - the latest media (music, games, celebrity pictures and music videos) was often hidden so that the phone's owner could benefit from a period of exclusive ownership. Several of the young men explained that they limited sharing in order to monopolize newly released (and thus fashionable) media. A new hip hop song could be 'displayed' to others (they could listen to it), but it would not be (willingly) shared via Bluetooth.

You want to be the first person to know the lyrics of the song. It makes you special when you are the only one who is an insider. It is a hard competition. Everyone tries to be first. This is a boys thing more than a girls thing. (Bongani, m, 17)

Pictures of friends were also collectible items, and played a role in young people's self-presentation strategies within peer groups:

If you have lot of pictures of friends on your phone, then you are a popular person. If you don't have, then someone is shy and doesn't have any friends. So it is our goal to have a lot of photos on the cell phone. (Bongani, m, 17)

Andile (m, 17) explained that his phone's picture gallery helped to communicate his status and identity: 'I show

other people that these are my friends'. In this way the picture gallery functioned much like a friends list on Facebook might function for other young people where the internet was more accessible and part of everyday life. For the young men, messages and pictures of girls had particular currency and Bongani and Lerato (f, 17) commented that some people 'stole' photographs from other people's phones to appear to have more girlfriends, or to pretend that they knew popular good-looking people. Bongani explained that the young men used pictures and messages from girls to 'show off', establishing their masculinity in the eyes of their peers, as playboys. Mandla explained that young women's pictures and messages would not be put on display in cases where the young man had romantic feelings about the woman: *If it is real love then [you do not use them to show off]. But for the rest yes.* (Mandla, m, 18)

Thus, in summary, images associated with romantic or sexual relationships can mark intensive sharing or intimacy which must be concealed from the older generation. Alternatively such images function as reified tokens in a collecting game where an extensive network of peers compete for status, or engage in the aggressive forms of 'outing' associated with cyberbullying.

DESIGN CONCERNS

Media sharing by young people raises complex design-related, legal and ethical challenges. Apart from intellectual property issues, surveillance, and public sharing of mobile media all have implications for parental and state regulation, and, potentially be related to cyberbullying or other forms of abuse. These considerations are particularly acute in the context of young people's vulnerability and their sometimes short-lived relationships. Nonetheless, we feel it is important to prioritize the concerns of the young people who participated in our study. Our conclusions reflect the high value they attached to participating extensively in phone sharing practices while still having a more precise control over what they shared.

Privacy

Relationships with peers (best friends, friends, romantic partners and brothers and sisters) often involved intensive cellphone and media sharing. Relationships with the older generation (fathers, mothers, uncles and aunts) or a more extensive network of peers were considerably less open, but phones needed to remain accessible to allow resource sharing. These complex arrangements did not respect traditional Western boundaries around the privacy of the individual, or the home/work division. They were dynamic and sometimes shifted disconcertingly as peer relationships deepened, fizzled out or ended abruptly.

To better support young people's attempts to create and manage their own spaces for discreet sharing or privacy, manufacturers could offer 'hidden' profiles which are not visible but can be unlocked by their creator. Currently no

handset we surveyed provides this kind of privacy. Such spaces could also implement a relational model of file-sharing, where shared access to media could be granted and later withdrawn if necessary. Another approach would be to support the creation of identities on external memory cards, supporting privacy practices also documented by researchers in India [23]. In the same way that a computer can boot into different modes, it might help if handsets booted an identity off an external card.

Media sharing

Bluetooth presents users with many obstacles to usability[23]. Despite its popularity, Bluetooth functionality is often buried deep in the menus, or users need to enter a file browser, navigate to the file, and choose a Bluetooth sharing option. None of the participants were even aware of the existence of the “mass send” option provided by most Bluetooth implementations. To avoid slow Bluetooth transfers, memory cards were frequently transferred between friend’s phones. This raises file compatibility issues, and also an alarming tendency by some handsets to automatically reformat an unrecognized memory card. Memory cards are also not designed to be carried around, and their miniaturised size meant that they were easily lost. Although there now exist multiple-SIM handsets for the developing world, these support a single user with multiple SIMs – current designs make it unnecessarily complex for users to swap a SIM between handsets. Again, handsets should support easier access and more robust forms of card swapping, or provide multiple slots for card copying.

File-sharing or messaging

Other researchers have noted that usability of Bluetooth sharing is improved when transfers are announced via messaging interfaces [8]. Our study goes beyond this to show how extensively Bluetooth has been appropriated for synchronous and spatially proximate messaging. Using Bluetooth (which has an interface designed for file-sharing) to convey interpersonal messages reveals the existence of at least three distinct problems. First, Bluetooth is popular at least in part because of the high cost of airtime, which limits online sharing. Semi-public interfaces could enhance the usefulness of public Bluetooth-based public displays [14], by allowing more affordable uploads to social network sites via cheaper broadband connections. Second, in the case of phone ‘pairing’, where paired devices can gain access to all the content on another device, local Bluetooth practices highlight the inadequacies of absolute all-or-nothing privacy models. Third, the photo cards reveal the difficulties associated with sharing short text messages via Bluetooth, since even simple texts had to be laboriously created with image-editing software. The absence of any methods for transferring simple verbal messages (or lengthier texts) via Bluetooth is a distinct limitation of current feature phones. An expansion of Bluetooth functionality could allow free text-based messaging and commenting between collocated users. The popular

decorative visual features of the cards would likely also be welcomed in other forms of text messaging.

CONCLUSION

While young people around the world use phones to share media and construct digital identities, various local contexts, resources and norms shape practices differently. In this paper we have reported on existing practices in one context and show how current handset designs still make erroneous assumptions based on the behavior and values of wealthier consumers. We believe that with a small effort in design, it is possible to create handsets that better serve the needs of the young people who participated in this study and, perhaps, other teens throughout the developing world.

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