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Adriana de Souza e Silva, Daniel M. Sutko, Fernando A. Salis and Claudio de Souza e Silva

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Adriana de Souza e Silva

IT University of Copenhagen, Denmark / NC State University, USA

Daniel M. Sutko

North Carolina State University, USA

Fernando A. Salis

Federal University of Rio de Janeiro, Brazil

Claudio de Souza e Silva

State University of University of Rio de Janeiro (UFRJ), Brazil

Abstract

This qualitative case study describes the social appropriation of mobile phones among low-income communities in Rio de Janeiro (Brazil) by asking how *favela* (slum) residents appropriate cell phones. Findings highlight the difficulty these populations encounter in acquiring and using cell phones due to social and economic factors, and the consequent subversive or illegal tactics used to gain access to such technology. Moreover, these tactics are embedded in and exemplars of the cyclic power relationships between high- and low-income populations that constitute the unique use of mobile technologies in these Brazilian slums. The article concludes by suggesting that future research on technology in low-income communities focus instead on the relationship of people to technology rather than a dichotomization of their access or lack thereof.

Keywords

access to technology, appropriation, digital divide, globalization, infrastructure, low-income communities, mobile phones, sharing, slums, theft

Corresponding author:

Adriana de Souza e Silva, IT University of Copenhagen, Design, Culture and Mobile Communication Group, Rued Langgaards Vej 7, DK-2300 København S, Denmark

Email: adriana@souzaesilva.com

As one of the largest cities in the world,¹ Rio de Janeiro is in many ways no different than São Paulo, Mexico City, Beijing, Lagos, Cape Town and other major cities in the developing world characterized by gross economic inequalities among the population. Yet, one of the peculiarities of Rio de Janeiro is the existence of destitute areas called *favelas* (similar to a slum, in Portuguese) that are situated in the hills amidst the highest income neighborhoods. Although the ‘asphalt world’ (as the wealthy neighborhoods are called) and the *favela* represent distinct socio-economic realities, residents’ lives are intertwined. For example, *favela* residents get their utilities through illegal connections called *gatos* that tap into the urban infrastructure. On the other hand, middle class youth go to the *favelas* to participate in ‘funk parties’ (a party unique to *favela* culture) and to buy drugs. Similarly, drug dealers have rapport with employees of cell phone providers who allow them to acquire SIM cards that place free calls (a practice called *diretão*, described in this article) through which they exert control in the *favelas* from prison.

This qualitative study describes the social appropriation of mobile phones by low-income residents in three *favelas* in Rio de Janeiro: Jardim América, Vidigal, and Mangueira. Our data highlight a reality that remains an intrinsic part of both Brazilian urban life, and many major metropolises in the global south: the almost symbiotic relationship between high- and low-income populations. This article thus frames the appropriation of the cell phone as a mirror of social values embedded in the relationships between low- and high-income communities and power structures both legal (such as service providers or the state) and illegal (such as black market or drug dealers) within the urban context of Rio de Janeiro. Moreover, it represents a unique contribution to the existing mobile phone literature. First, unlike cell phone studies focusing on rural populations or rural to urban migrant workers (Galperin, 2005; Goodman, 2005; Qiu, 2008; Rangaswamy and Toyama, 2006), we focus on low-income enclaves inside urban spaces. Second, unlike studies focusing only on appropriation within low-income communities (Law and Peng, 2006; Ureta, 2008), we highlight interconnections between high- and low-income populations. Finally, unlike studies which present cell phones as ways of bridging the digital divide and promoting economic development (Coyle, 2005; Lechoée et al., 2003; Sherry et al., 2005), our data show that cell phones themselves do not necessarily bridge nor create divides. Rather, they are embedded in existing social practices.

In order to develop this argument, we first situate our study within the literature about the use of cell phones in developing countries, followed by our research methods, which frame our data analysis. Finally, we discuss the main study findings and situate them in relation to the known literature. We conclude by suggesting that studies on technology in low-income communities should focus more on the relationship of people with technology rather than a dichotomization of their access to it.

Mobile phone appropriation in the global south

Donner (2008) proposes three major trends of cell phone research on developing countries: mobile adoption (Dong and Li, 2004; Rao and Mendoza, 2005; Vodafone, 2007), the impact of cell phones (Skuse and Cousins, 2007; Waverman et al., 2005), and the interrelationships between users and use of mobile phones (Horst and Miller, 2006; Pertierra, 2005, 2007). Frequently, these trends are investigated simultaneously rather

than separately. For example, studies on mobile adoption often include issues about the impacts of cell phone use and the consequent interrelationships between users and technologies. Some studies identify a number of common practices that permeate the use of cell phones in the global south, which appear to be independent of type of community (urban vs. rural) and type of use (private/family vs. commercial/small business). For example, most developing countries rely heavily on pre-paid cell phones, which account for 80–90 percent of total cell phones (de Souza e Silva, 2007; Toral, 2003). The reliance on pre-paid phones results in practices like ‘beeping’ (Donner, 2005; Sey, 2007; Ureta, 2008), which entails calling another party and hanging up after one or two rings, so the other party knows to return the call or act upon some pre-defined arrangement. Another well-documented practice of low-income cell phone users is collective sharing, usually due to a dearth of affordable access (Bell, 2005; Samuel et al., 2005; Vodafone, 2004), which generally substitutes for the (often non-existent) family landline (Ureta, 2008). All these practices are also observed in our study of the use of cell phones within the urban poor in Rio de Janeiro. Practices such as beeping and sharing have frequently been considered modes of appropriation of mobile use.

As noted by Wirth et al. (2008), the social appropriation of ICTs is closely related to adoption, since appropriation correlates with pricing and availability, but it also differs in that most adoption studies generally draw from Innovation Diffusion Theory (Rogers, 2003) and Theory of Planned Behavior (Ajzen, 1985). Some scholars apply adoption research in order to understand the development of cell phone services, such as gaming and mobile internet (Hung et al., 2003; Kleijnen et al., 2003), and others focus primarily on ways in which users contribute to new uses of technology after having adopted them, which include beeping and sharing (Lievrouw and Livingstone, 2002; Silverstone and Haddon, 1996). Within this second trend, Katz and Aakhus’ (2002) theory of *Apparatgeist* highlights ways in which society and technology cyclically influence each other, an idea which is also developed by Castells et al. (2007).

Among the urban poor in Brazil, however, we can observe yet another type of technological appropriation by which users creatively subvert the technology for their needs. This type of appropriation is described by Bar et al. (2007) as ‘cannibalism’.² Cannibalism describes appropriation as a process rising from negotiations about power and control over the use and configuration of technologies. This framework is relevant here because it is based on studies of ICTs in the developing world, and it defines appropriation as a fundamentally *political* process, ‘a battle for power and control over the configuration of a technological system’ (Bar et al., 2007: 1). Bar et al. (2007) also clearly distinguish three phases of the appropriation process: (1) adoption, referring to the use of technology as envisioned by designers; (2) appropriation, in which users experiment with technology within limits pre-established by designers – practices of beeping and sharing fall within this category, and (3) cannibalistic appropriation, which is a creative and subversive process driven by users.

Although scholarly attention to the use and appropriation of mobile phones in the developing world is growing (Donner, 2008; Ling and Donner, 2009), there is a striking lack of research about social appropriation of mobile phones in Latin America, and specifically in Brazil. Studies of developing countries often exclude Brazil because the country is considered an upper-middle income economy by the World Bank (Donner,

2008), but this classification ignores Brazil's extremely uneven income distribution (UDNP, 2008), which results in roughly 10 percent of the population earning 46 percent of the overall income, while 50 percent makes only 13.3 percent (IPEA, 2005: 52). Despite this income distribution, there are about 203 million cell phones in Brazil (as of December 2010), making Brazil the fifth largest country worldwide in terms of cell phone absolute numbers, with a 104 percent cell phone penetration rate (Teleco, 2011).

Given Brazil's particular socio-economic situation among other developing countries, we suggest that Brazil is an important case for understanding different patterns of appropriation. Specifically, we demonstrate how cell phone appropriation in Brazil reveals the cyclic power interactions between extremely unequal socio-economic populations. In addition, a large number of existing studies on developing countries target rural populations, or migrant rural to urban workers (Galperin, 2005; Shanmugavelan, 2004; Skuse and Cousins, 2007), but our research focuses on the distinctly urban environment of Rio de Janeiro, where extremely poor populations live next to high-income populations. This gap in the literature prompted us to begin with one, primary research question: How do *favela* residents appropriate cell phones?

Methods

This research was approved by the first author's institution's institutional review board, and all interviewees signed informed-consent forms to be audiotaped during the interview and to have interviews and survey answers used for this study. Data were collected during four focus group-style interviews (with three to five participants present at each interview) and a brief demographic survey to collect information on age, income, literacy, and technological proficiency and ownership. The study included a total of 15 participants, ranging in age from 15 to 57, with a median age of 30.7. The participants represent typical *favela* dwellers³ within their respective, geographically disparate slums in Rio de Janeiro: Vidigal, Mangueira, and Jardim América. The choice of these three *favelas* was primarily based on two reasons. First, the previous work that the third and fourth authors have been developing in these communities since 2005 allowed us to enter these communities safely because of key informants. Second, these communities are also good geographic samples of the three main areas of Rio: respectively, Center, North, and South Zones.

Locations for the focus groups⁴ were chosen for their relatively easy access inside the *favela* and because they had been common meeting places for the participants for previous research projects. During the interviews, the participants would interject during each other's answers and talk among themselves as well in answering the questions. All such interactions were captured and provided especially rich information.

The interviews resulted in four hours of audio, which were transcribed and translated into English by the first author, a native Brazilian fluent in Portuguese and English. Before beginning data analysis, the authors agreed that the verbal unit of analysis would be any meaningful phrase, sentence, or paragraph that could address one of the research questions. Data were analyzed using inductive analysis and constant comparison (Glaser and Strauss, 1967) to generate themes reflective of the residents' answers to questions

and descriptive of their experiences with mobile phones. After all of the meaningful phrases were categorized, the first and second authors did ‘check coding’ to refine the categories (Miles and Huberman, 1994). Category external homogeneity was further tested with an independent coder, resulting in 87.5 percent intercoder reliability. In sum, sampling, collection, and analysis methods provide our case study with rich, illustrative data, though we cannot assume this data is definitive and generalizable for all low-income communities in Brazil.

Appropriation in the *favelas*

While *favelas* tend to be ignored and treated as ‘invisible’ by the government and high-income populations (Dimenstein et al., 2004), complex power relationships connecting rich and poor are reflected in the appropriation of cell phones among the low-income population. *Favelas* have no official relationship with the government and its residents therefore pay no taxes. While the government does not forcibly remove *favela* residents, it also does not improve their lives in the way of infrastructure (electricity, water, gas) or social services. Often as a consequence, *favela* dwellers frequently acquire utilities illegally through makeshift wire and pipe taps, called *gatos* (‘cats’). Most of the working population in *favelas* attend school until fourth grade (Vasconcellos, 2006) and are subsequently employed in non-specialized jobs such as doorkeepers and cleaners. Most children and teenagers contribute to the family income when not in school, resulting in frequent school absences and drop-outs (Vasconcellos, 2006), a phenomenon common among other low-income communities in Brazil, like Recife and Florianópolis (Scheper-Hughes, 1993; Silva, 2009). Our interviews revealed three interconnected dimensions to how *favela* residents appropriate cell phones: (1) the difficulty *favela* residents have in legitimately gaining access to cell phones; (2) the comparative ease of gaining illegal access to cell phones; and (3) the materiality of the cell phone as an embodiment of social relations.

Difficulties of ownership

The major problem is to have money to buy credits and put on the phone. (Valéria,⁵ 47, female, Mangueira)

Not everyone knows how to deal with the device. (Teresa, 59, female, Mangueira)

They give you the cell phone, Internet, camera, everything. But you go and take the pictures and then you are like a clown, because poor people don’t have the money to download the pictures to a computer. (Helena, 43, female, Mangueira)

For most *favela* residents, procuring and owning a cell phone represents a financial, technological, and social challenge. The first barrier to owning a cell phone is financial.

Used is cheap, but we never have the amount that they ask for it. (Lucia, 31, female, Mangueira)

Assuming one can acquire a handset, one must pay the subscription fee, which is either pre-paid or post-paid. Approximately 82 percent of cell phones in Brazil are pre-paid (Teleco, 2011), a pattern prevalent in other regions in the global south (Castells et al., 2007; Horst and Miller, 2006; James and Versteeg, 2007). Pre-paid phones allow users to control costs, and although pre-paid minutes are generally more expensive than regular subscription fees (Mahan, 2003), pre-paid phones are perceived as more accessible.

I was not even talking about the post-paid. I was talking about the pre-paid, which is cheaper nowadays. (Valéria, 47, female, Mangueira)

Most interviewees said they do not pay at all for their cell phone, since regularly adding credits is expensive. Without enough credits, a cell phone will call another phone, but the call is dropped upon connection. The other party can then call back if necessary, since pre-paid phones without credits can still receive calls. Furthermore, residents cannot go over their monthly allowance with a pre-paid phone, so they do not go into debt, as some do with post-paid. The problem of going into debt because of post-paid service may result from not understanding the contract or terms of service. As one resident exasperatedly asked:

There are codes that we, normal citizens, cannot decipher, do you understand? How is it charged? How much is a minute? How much does a call cost? How do you call? (Rubens, 35, male, Jardim América)

There is a clear lack of knowledge here, and we speculate this could be due to the low education levels of the population. While some users identify difficulties with understanding cell phone contracts and services, on the whole, *favela* residents have developed advanced enough understandings of services to ably subvert them. This will be discussed in more detail in the next section. Besides not understanding contracts, the residents also do not understand the technical operation of the phone – perhaps also an education-literacy gap. As one resident bemoans:

I think that cell phone software is very complicated. The technology is relatively easy, but it is very complex for the average person – even to use the voicemail ... (Rubens, 35, male, Jardim América)

As becomes evident in these quotes, there is a clear divide regarding the social appropriation of mobiles in Brazil. While some users do fall under Bar et al.'s (2007) categories of appropriation by means of baroque layering (personalization of the phone), creolization (recombining or reprogramming the technology) and cannibalism (hacking and subverting the technology), a large portion of the common low-income users lack even the basic ability to use the phone as originally intended by designers (which corresponds to the initial phase of adoption, a preliminary phase considered necessary for the subsequent appropriation). In other words, there is a technological form of exclusion that reflects an already existing social exclusion.

The final difficulty of cell phone procurement and ownership is the social difficulty of using one. The residents repeatedly lamented the difficulties of owning a cell phone that could be stolen from them or cloned.

I am even afraid even of answering my phone on the streets, with fear of being robbed. (Lucia, 31, female, Mangueira)

Even if the cell phone just rings inside your pocket, somebody might follow you after you get out of the bus and take it. (Luis, 41, male, Mangueira)

Then, if the device is good, he will sell it in the *favela*. But if it is a cheap cell phone, he will give it to the kids as a toy. (Lucia, 31, female, Mangueira)

It is common practice to find (or steal) cell phones and re-sell them in the *favelas*, creating a type of black market, as will be shown in the next section. Cell phone theft is also common in other developing nations, where mobiles are regarded as status symbols (Bell, 2005; Horst and Miller, 2006). Sometimes, finding a forgotten phone may be considered a legitimate acquisition:

I then waited 10 minutes and thought: 'If anybody calls within 10 minutes, I will return the phone; if not, I will turn it off.' Nobody called and I turned it off. Then I bought another SIM card and gave the phone as a present to my brother. It was a brand new phone! (Lourdes, 23, female, Jardim América)

Because accessibility to cell phones is largely achieved illegally, the rampant fraud that makes ownership a possibility also makes ownership a hassle and potential problem. The inability to afford the device also fosters a black (or 'parallel') market.

Ease of illegal ownership

The parallel market evinces the most subversive form of appropriation, described by Bar et al. (2007: 34) as cannibalism, by which 'the user chooses to engage in direct conflict with the suppliers of technology ..., including modifications of the device that place the user in direct opposition with the providers' business model ...'. We found these tensions between users and providers also mirrored the power relationships between low- and high-income populations.

It was around 300 [in the store] ... in the parallel market I paid 50. (Helena, 43, female, Mangueira)

Because *favela* residents are precluded from corporately legitimized cell phone ownership, they have developed illegal yet easy means for procuring phones while legally avoiding the cost of service and subverting service providers. The clearest example of illegal procurement is the existence of the parallel market: not one interviewee purchased a phone in a store. Phones were either received as presents or purchased from someone in the *favela*. Although passing around cell phones is also common in other developing

nations (Bell, 2005; Burrell, 2010; Castells et al., 2007), in Rio we see that the circulation of phones within *favelas* also comes from phones stolen from the high-income population. Easily acquiring a cell phone is complemented by the difficulty of dealing with phone theft. It is easy to get a phone; it is easy to lose a phone.

Besides dealing with the parallel market, some residents (most often the drug dealers) have also defrauded service providers through *diretão*.

Yes, I already had one (laughs). It's a cell phone that you can call anybody, anywhere. ... I won't tell you where you can get one, because I can be arrested ... (Gilberto, 15, male, Vidigal)

Diretão, as explained by the interviewees, is a phone illegally provided by service provider employees with a special SIM card that allows the user to freely call anywhere in the world for three months. The catch is that, for each individual call, after ten minutes, cell position can be triangulated by the provider, which results in disabling the *diretão*, and possibly capturing the service thief. Drug traffickers who are in prison make use of *diretão* phones to stay in touch with the outside world and continue managing the affairs of the gangs. Ironically, prisons can actually become a safe space for gang members, who are assured some level of protection that they might not otherwise have in the *favelas*. For the duration of the dealer's internment, the state becomes a caretaker for the dealer and the dealer becomes – in a perverse way – free to focus on the affairs of the gang, rather than staying alive or avoiding rival gangs. Besides being a well-known practice among our interviewees in all *favelas*, this particular practice of the drug dealers has been addressed in scholarly articles and popular press alike (Anderson, 2009; Downie, 2006; Gamini, 2003; Hanson, 2006; Vaz et al., 2006). Within this context, the appropriation practices evidenced by our research are configured almost like an inversed type of cannibalism. If Bar et al. (2007: 35) suggest that users hack the technology 'in ways that are meant to defeat the provider's control and come in direct conflict with the provider's interest', here it's ironic that the dealer can perhaps operate even more effectively from within the state apparatus to subvert that same apparatus. This subversive appropriation is embodied in the practice of *diretão* itself. The same people who ostensibly manage the interests and policies of the providers are the ones who actively undermine it. These employees' actions point to an even broader issue, which is that – apparently – state capital is not as effective at providing adequate standards of living (via remuneration for labor) as the black market. These employees do not provide *diretão* out of any sort of affinity with and for the traffickers, but because they are either coerced with threats to them or their families or encouraged with compensation in terms of money, drugs, or stolen goods. Indeed, *diretão* is also sold in the *favelas* for about 70 USD, which is a quarter of the minimum monthly salary in Brazil.⁶ In effect, the providers of *diretão* can also make money on the side by providing it to other residents in the *favelas* besides traffickers. This practice fuels the development of the parallel market and cell phone robbery, since it is easy to steal a phone and replace its SIM card for a *diretão*.

Diretão is a good example of the complex networks between low- and high-income populations in Brazilian society, evidenced by the social appropriation of technology. However, instead of leading to the third phase of technological evolution defined by Bar

et al. as re-configuration, by which providers regain control of and redesign technology, practices such as *diretão* become sedimented in the appropriation phase, since there is no interest – neither from dealers, nor from providers – to reconfigure that technology and the practices it entails.

Diretão follows the logics of the drug traffic itself, working within an international network that includes weapons trafficking, money laundering, corruption, political influence, and communication technologies. The social problems caused by the black market are obviously exclusive neither of low-income populations, nor the Brazilian situation. Other stakeholders in this global issue include: producers, consumers, politicians, police, illegitimate and legitimate businessmen, and lawyers, among others. Likewise, the scope of these problems affects and connects many aspects of society: cell phone employees and police alike contribute to allowing dealers access to a communication tool that helps them organize the traffic, which also provides black market goods to the same high income population in the ‘asphalt world’ that suffers the ubiquitous threat of cell phone theft.

Besides *diretão*, cloning is another common form of appropriation in the *favela*, though it follows the cannibalistic mode.

They cloned our house phone. Every day there is a lady that calls asking: ‘Could I speak with Maria do Carmo?’ Every day! (Gilberto, 15, male, Vidigal)

Mobiles, especially older analog ones, are easily cloned. Each phone has a unique electronic serial number (ESN) and telephone number, which can be detected through hacking transmission frequencies or the unit. If one discovers a phone’s ESN and telephone number, one can reproduce that information on another handset, and the cell towers have no way of distinguishing between the two phones. So, one person ends up footing the bill for both units.

I was there in Manguinhos, I had a friend who had two cell phones and both were cloned. One was kept with her, and the other one with her sister. How she cloned it, I don’t know. (Teresa, 59, female, Mangueira)

Materialization of social relations

Finally, another type of appropriation of the cell phone concerns the sharing of the device itself. Although *favela* dwellers acknowledge private ownership, they typically share phones with family and friends, especially if the cell phone is the only telephone available. It is common practice to call someone simply to talk to another person who may be nearby. A cell phone owner usually serves as a ‘point of reference’ for community communication. Interviewees described different situations where a phone was passed around.

I share it with my brother and my sister-in-law. As he doesn’t have a cell phone, my mother calls my cell to speak to him. And my aunt calls from my cell phone as well. (Maria, 22, female, Vidigal)

Sometimes the cell phone is sold between acquaintances, sometimes it is given as a present, and sometimes it is borrowed. Whatever the case, the cell phone materially reflects social relations through its sharing.

Ah, my cell phone passes around on everybody's hands, because I don't have a charger. So I give it to the neighbor to charge it for me, and to my brother from time to time. This week I've seen a picture from L. on the cell phone. So I thought: 'Wow, he probably got my phone, there is a naked person in the cell phone ... he must have gotten it.' So should I complain with him? (Lucia, 31, female, Mangueira)

The sharing of cell phone as a utility is a form of appropriation widely used in developing countries as a way to control costs (Bell, 2005; Burrell, 2010; Donner, 2008; Horst and Miller, 2006; James and Versteeg, 2007; Samuel et al., 2005; Ureta, 2008), where sharing compensates for scarcity. Such individuals utilize the cell phone collectively, a practice which clearly subverts the expected use of the cell phone in the developed world as a personal and private device (Harper et al., 2005; Ito et al., 2005; Katz and Aakhus, 2002; Ling, 2004; Ling and Donner, 2009). Although there are examples of shared use in developed countries (Kasesniemi and Rautiainen, 2002; Weilenmann and Larsson, 2002), where the content of the messages or conversation are shared among the group, the devices still remain distinctly individually owned. In the case of *favela* culture, phone-sharing fits into the existing practice of *gatos*, or hacking infrastructure. This practice of sharing cell phones in Brazil falls under the subversive type of appropriation of cannibalism, following Yochai Benkler's definition of sharing as a practice that takes place outside the market (cited in Burrell, 2010: 5).

The sharing of cell phones does not only occur among family and friends. At the community level, one of the interviewees who runs an NGO at Jardim América noted that a group of eight people used three cell phones that belonged to the NGO. As is widely acknowledged in the literature (Castells et al., 2007; de Souza e Silva, 2007; James and Versteeg, 2007), cell phones are also used as substitutes for a missing infrastructure of community pay phones or landlines.

Conclusion

In this study we found that cell phone practices mirrored other social and material conditions wherein residents occupy a space on the border of legitimacy and illegitimacy, and live and operate in a grey area. Consequently, the residents use illegal means to procure what is basically another utility: the cell phone. As such, the residents are carrying on what can be understood as the tradition of *gatos* – of appropriating utilities. This dynamic is also evidenced by the black market that manufacturers have little incentive to shut down, because such a market is a sales guarantee, since people who lose phones will find replacements. Other people do not lose their phones to theft but rather willingly exchange them for drugs, making the cell phone a type of currency. In essence, the devices that originate in the most privileged populations end up in the slums with replaced SIM cards, functioning as prepaid phones or *diretões* that are materially shared

among the community. As such, this market also functions as a system in which low- and high-income populations interact.

Access to technology is touted as paramount for progress, social mobility, and quality of life. Frequently, increased cell phone penetration is considered a sign of social progress and increased equality. Studies often argue the cell phone bridges the digital divide (Coyle, 2005; Lechoée et al., 2003; Rice and Katz, 2003). However, this technologically deterministic perspective also reifies the notion of a digital divide and a distinction that may not exist in the way we frame it, or a technological dichotomy which may not be a productive way of problematizing social issues. Indeed, Sassi (2005) explores different approaches to the digital divide, differentiating the technocratic perspective from other approaches that more thoroughly take into consideration the relationship between people and technology, namely the social structure approach, the information structure and exclusion approach (Lash, 2002), and the modernization and capitalism approach (Castells, 2000). However, rather than following the social structure approach (May, 2002; Sparks, 2000; Winston, 1986), which considers social inequalities as independent from technological infrastructures, we follow Castells' (2000) modernization and capitalism approach and Lash's (2002) information structure and exclusion approach which view ICTs as both consequences of the industrial society division of labor and cultural individualization, as well as causes of new social and economic inequalities.

Building upon Castells' and Lash's framework, our research shows that technological development and social issues cannot be seen as disconnected from each other, and that there are incredibly complex interconnections between diverse populations, connections that are analytically irreducible to neat classifications along social and economic categories. Even within populations there are enormous paradoxes that cannot be neatly resolved. For example, the *favela* residents both make use of the easy theft of cell phones but also suffer because of the same easy thievery. Likewise, although *favela* residents obviously suffer from a lack of access to education, skills, and access to work, we can also see how their involvement in the parallel market – driven by the same disadvantages – itself requires the development of certain technical skills. Technical skills are evinced in practices such as cloning or *diretão*; a level of education about telecoms services is implied in savvy contract circumventions such as beeping; and work is certainly part of the labor required to steal and re-sell. These informal modes of education, skills, and work provide *favela* residents access to some of the conveniences and inconveniences of otherwise inaccessible communication technology.

In conclusion, cell phone use among *favela* residents both follows and challenges Bar et al.'s model of cannibalistic appropriation by embodying and reflecting pre-existing power relationships in a subversive process that is simultaneously political and cultural. Future studies on the use of cell phones among the urban poor in Brazil should take into consideration this theoretical approach, but also theorize how the modes of appropriation in the *favelas* create yet a new form of appropriation that subverts the system from within. We hope that this preliminary exploration of the use of cell phones among the *favelas* in Rio de Janeiro may serve as a basis for more large-scale empirical studies that compare technological practices among high- and low-income populations.

Notes

1. According to the 2007 census of the Brazilian Institute of Geography and Statistics (IBGE) the city of Rio de Janeiro has roughly 6 million people (Alves and Almeida, 2007).
2. The term ‘cannibalism’ is a reference to the anthropophagic movement in Brazil, a cultural and artistic movement led by poet Oswald de Andrade in the 1920s. Its goal was to ‘swallow’ (change, modify, appropriate) foreign (American/European) cultures, in order to incorporate them into Brazilian culture through a local lens. Indeed, Bar et al. (2007) are specifically focused upon Brazil in this article.
3. Results of our demographic survey matched the typical *favela* scenario as described by existing literature (Oliveira, 1996; Scheper-Hughes, 1993; Vasconcellos, 2006). Because two of the researchers have extensive experience conducting research in these respective *favelas*, we relied on the researchers’ knowledge and key informants for identifying typical cases (Patton, 2002).
4. Besides their temporal efficiency, focus groups benefit the quality of data (Krueger and Casey, 2000) and potentially offer socio-economically marginalized groups – such as *favela* residents – an environment in which to safely discuss their subjectivity and resistance (Madriz, 2000). One of the shortcomings of our focus group approach is that we had relatively little time to pursue certain topics in great depth with each of our interviewees.
5. All names have been changed to preserve anonymity.
6. Brazilian income is calculated by month. The Brazilian minimum salary (roughly corresponding to the American minimum wage) is 510 reais (roughly 305 USD) as of January 2011. According to the Brazilian Institute of Geography and Statistics (IBGE, 2005) survey, about 60 percent of the Brazilian population earns less than twice the minimum monthly salary.

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Adriana de Souza e Silva is an Associate Professor at the IT University of Copenhagen at the Design, Culture and Mobile Communication research group. She is also an Assistant Professor at the Department of Communication at North Carolina State University (NCSU). Dr. de Souza e Silva's research focuses on how mobile and locative interfaces shape people's interactions with public spaces and create new forms of sociability. She is the co-editor (with Daniel M. Sutko) of the book *Digital Cityscapes—Merging digital and urban playspaces* (Peter Lang, 2009), and the co-author (with Eric Gordon) of the forthcoming book *Net-Locality: Why location matters in a networked world* (Blackwell, 2011).

Daniel M. Sutko is a doctoral candidate in the Communication, Rhetoric, and Digital Media (CRDM) program at North Carolina State University (NCSU). His research interests include cultural approaches to media/technology, the social production of spaces and mobilities, and asking what's new about new media. He teaches media history, theory, and criticism in the Department of Communication and is a research assistant in the Mobile Gaming Research Lab. His recent publications focus on locative media, mobility, urban sociability, globalization and media infrastructure, and the philosophy of the virtual. He is co-editor, with Adriana de Souza e Silva, of *Digital Cityscapes: Merging Digital and Urban Playspaces* (Peter Lang, 2009).

Fernando A. Salis is a filmmaker, audiovisual artist and Associate Professor at the Federal University of Rio de Janeiro, Brazil (UFRJ), where he teaches film and performance theory, and coordinates the Audiovisual Lab and the video social project. In the US, he is a member of the Brazil Seminar at Columbia University. He was a visiting professor at New York University and Carlos III Madrid University. His films were shown in 11 countries in Universities, conferences and festivals. His most recent film, *Bank of Agents*, is the result of two years of research on AIDS prevention in the *favelas* of Rio de Janeiro.

Claudio de Souza e Silva is a doctoral candidate at the Graduate Program in Social Sciences at the State University of Rio de Janeiro (PPCIS/UERJ). He has a Master's degree in Political Sciences at the University Research Institute of Rio de Janeiro (IUPERJ) and a Bachelor's degree from the Institute of Philosophy and Social Sciences at the Federal University of Rio de Janeiro (IFCS/UFRJ). His research focuses on the study of Brazilian political culture, as well as the history of political ideas in this country.