

# Shining a light on agency: Examining responses to resource constraints to uncover opportunities for design

EMMA J. ROSE

*Anthro-Tech*

ROBERT RACADIO

*University of Washington*

*People employ creative ways to overcome the challenges of daily life. The construct of agency is a productive area of inquiry when considering how people respond to these challenges. Exploring moments of agency provides an embodied understanding of people's motivations and helps reveal the structural and technological barriers they encounter every day. We propose a framework of agency and three corresponding categories: resourcefulness, resilience, and powerlessness. This framework was developed while working with data from two design ethnographies: one in Bishkek, Kyrgyzstan and the other in Seattle, Washington.*

## INTRODUCTION

In our research, we are interested in understanding where and how resources are constrained in order to improve the material conditions of everyday life. By identifying the difficulties that people face in their lives, we hope to identify innovative ideas for technology design. We investigated disparate, but resource-constrained, settings in Bishkek, Kyrgyzstan and Seattle, Washington in two design ethnographies. After looking at what was difficult in these settings and why, we further focused on how people make choices and take action based on these difficulties. As a result, we formulated a conceptual framework using the concept of agency, as drawn from Giddens' structuration theory, to unpack three categories of agency: resourcefulness, resilience, and powerlessness (Giddens 1984).

Using this framework of agency can be instructive for other technology researchers by providing an approach to structure research questions and by providing a perspective from which to tackle data analysis. Looking specifically at agency interrogates how systems and structures impede or enable individuals' ability to act, which can shine light on design opportunities and structures we take for granted. Finally, this lens of agency is especially helpful when looking at under-served or hidden audiences such as the poor, or those who are resource-constrained. It can give voice, and therefore power, to groups that tend to be overlooked.

We will begin by providing context for the use of agency using Giddens' structuration theory and then detail the methodology used for the two design ethnographies. We define each of the three agency categories: resourcefulness, resiliency, and powerlessness and

present a selection of data collected from the two design ethnographies. We then demonstrate how each category has implications for design and research.

## **STRUCTURATION**

Structuration theory explains the interplay of human actors and the conditions of society that they encounter, how this interaction is responsible for social order and, how it changes overtime. Structuration is a critique of previous theoretical approaches, which isolate social order as either being the outcome of a set of objective structures or as a completely subjective response to the will and actions of individuals. In contrast, structuration theory considers social order as a duality. Agents and structures are not two entities independently acting upon one another; but rather, “the structural properties of social systems are both medium and outcome of the practices they recursively organize” (Giddens 1984:25). In other words, agents continuously recreate, through their actions, the structures that constrain them.

Agency is “being able to intervene in the world, or to refrain from such intervention, with the effect of influencing a specific process or state of affairs” (Giddens 1984:24). For Giddens, the human actor is a reflexive, knowledgeable being with extensive understanding of his/her social activities. When it comes to everyday life, competent members of society are “expert ‘sociologists’” (Giddens, 1984:26). These knowledgeable agents act reflexively and purposefully within the ongoing flow of social life—they monitor and make choices constantly about how to act in the world. While humans know and can explain what they are doing, they may “know little of the ramified consequences of the activities in which they engage” (Giddens, 1984:26).

Structure refers to the organizing aspects of society. These can include norms, language, culture, and institutions—the aspects of the social order that act as structures (or have “structuring properties”) that tend to stabilize and repeat over time. Per Giddens, structural properties are always both enabling and constraining, meaning structures dictate what should or can be done. At the same time, however, actors have the ability to act and can act according to or against the structural constraints within which they live. While structures enable and constrain actors, actors inform and modify structure through everyday practice. Below are we provide definitions of the three key categories within agency that proved most useful for understanding data from two design ethnographies:

Resourcefulness refers to the ability for people to deploy their expertise to solve or exploit structural constraints in ways that are sanctioned and productive. People who have very little in terms of resources are quite resourceful in finding ways to overcome their constraints.

The second category we identified across research sites was that of resiliency. Resiliency addresses how people manipulate structures or resources in order to overcome barriers. Resiliency differs from resourcefulness in that the behaviors people deploy to bring about desired results are often unsanctioned or beyond the purview of existing structures.

Our last facet of agency, powerlessness, captures the instances when people have little or no recourse to overcome constraints, regardless of whether their approach is sanctioned.

## METHODOLOGY

We conducted two design ethnographies to understand how people encounter life's daily challenges (Salvador, Bell, & Anderson 1999). The focus was to generate ideas and guidelines that could be used to create design solutions. Design ethnography is an appropriate technique for the tight schedules of technology design because it provides a quick way to gather contextual data.

The studies were conducted in Bishkek, Kyrgyzstan and Seattle, Washington. We asked similar research questions and identified common themes between the locations in order to develop a framework for designing for resource-constrained populations. Bishkek and Seattle are vastly different but our research demonstrates the utility of identifying universal themes for both settings. Kyrgyzstan is a multi-ethnic and multi-lingual society. As a former Soviet Republic, Kyrgyzstan gained independence in 1991 and continues to face a variety of economic, political and social challenges. The research for this study was conducted in 2006 and took place in two cities in Kyrgyzstan: the capital city of Bishkek (population 5,431,747) and the smaller town of Kara Balta (population, approximately 70,000), which is close to the border of Kazakhstan. At both locations, our team collected a variety of ethnographic data, including observations of daily life and participant observation. We conducted four group interviews with socially connected groups of people. A total of twelve participants took part and groups included multi-generational families and groups of young adults who were friends.

The second research site, Seattle, Washington, is the 23rd largest city in the United States (population of 616,627). This design ethnography continued the work from Kyrgyzstan, but focused specifically on the transportation constraints in daily life. Transportation is a crucial resource and helps people access resources, such as goods and services, education and employment. Several studies have shown that reliable access to transportation is key to alleviating poverty (see Hanmer, Booth, & Lovell 2000 and Sanchez 2008). Also, transportation supports social connections and, therefore, allows people to cultivate social capital (Bradbury). Seattle residents who depend on public transportation have limited options. As in the Kyrgyzstan study, a research team collected a variety of ethnographic data and also conducted interviews with five groups of people that included couples, families, and a group of homeless people. A subset of participants also created video diaries of their transportation experiences.

Both design ethnographies included semi-structured interviews with socially connected groups of people in order to understand a multiplicity of perspectives. Each interview lasted up to two hours and took place in public settings, such as a coffee shop or a community center, or private settings in people's homes. The interviews were recorded and transcribed. Researchers from the University of Washington coded each transcript and identified themes using the web-based tool Saturate (Sillito 2010). To maintain reliability, each interview was coded by at least two reviewers and discrepancies were resolved collaboratively. Each researcher coded multiple interviews to organize and analyze the data (Coffey & Atkinson 1996). In addition, the team wrote memos during coding to capture specific emergent themes or to pose questions about the data (Glaser 1998).

## UNPACKING AGENCY: THE THREE CATEGORIES

Agency emerged as a helpful construct to account for the ways in which people experienced and confronted challenges in their daily lives amidst a range of contexts and perspectives. Three categories of agency surfaced across the studies: resourcefulness, resiliency, and powerlessness. We present them here with emblematic examples from the study data.

### Resourcefulness

Resourcefulness is particularly evident in situations where people have developed expertise to make the best of what's available. When people deploy their expertise, resourceful is often visible. Across both research settings we found examples of participants being resourceful, two such examples are creating private spaces in public and overcoming economic constraints.

**Private in Public** - Many households in Kyrgyzstan are multi-generational, so private space within the home is limited. Family members, especially parents, closely monitor dating and relationships between young people. This constrained the ways that some of our younger participants were able to interact with their friends, primarily romantic interests. To supplement this space, many young people in the study talked about going for walks in the local parks with their peers and romantic interests. This was a socially acceptable alternative to meeting friends at home. By going out in public, our participants were able to cultivate relationships in ways they were otherwise unable to do so at home. These young people resourcefully leveraged alternative, but sanctioned, resources—the parks and their friends—to supplement a scarce resource, namely privacy.

Having a girlfriend doesn't fit the budget in general; it's mostly about walking [in the park]. Sometimes you go to the movies—you gather up with friends; but I don't spend a lot of money on her because it's so limited. —Jyrgal<sup>1</sup>

We go walking together in the evening with our boyfriends. My friends' boyfriends walk with us, but my boyfriend is busy and can't come all the time. He lives in Bishkek, but when he visits, we all go walking. —Kalima

In Seattle, we interviewed several participants who were homeless who, like our young participants in Kyrgyzstan, had limited opportunities for privacy. They developed a strategy for obtaining privacy by riding the bus. Being on the bus was a rare opportunity to enjoy private time and space in a life usually lived in the public sphere. Riding the bus provided moments of refuge, allowing them to gain a sense of privacy and autonomy even though they were in public.

---

<sup>1</sup> All names are pseudonyms.

There is a lot of chaos downtown. There's chaos on buses too, but on buses I don't have people coming up to me asking to buy dope or drinking. I can listen to my CD player and just ride the bus. –Ryan

For a marginalized group like the homeless, riding the bus can be an equalizing activity. In public spaces, a homeless person is often judged as a nuisance. But on the bus, the homeless person is just another fare-paying rider moving around the city.

**Economic Constraints** – Concerns about economic constraints pervaded life for participants in both studies. In Kyrgyzstan, many participants demonstrated money-saving strategies related to their phone use. Those with mobile phones often used SMS (short message service, or text messaging), which was cheaper than calling. Others took advantage of cheaper within-network rates by owning multiple phones for different service providers. A landline, either at home or work, was used for lengthier calls. Having these options increased people's ability to control their spending. Their resourcefulness allowed them to choose from among the available options and select the one that would save the most money and be the most appropriate for the type of call. This enacting of agency was supported by the structures that had been set up by the mobile phone service providers in Kyrgyzstan. For example, making a phone call requires that you have units on your SIM card. However, the units are only charged to the person making the call. Therefore, the caller can make a call and hang up before the receiver answers. This signals to the receiver that he/she should call back and, as a result, pay for the call. This practice, known as beeping, is common in many developing countries (Donner 2005).

In Seattle, where the study focused on transportation constraints, economic concerns were related to being able to pay bus fare. Participants demonstrated resourcefulness to save money and maximize their fares. Bus schedules, which are fixed, structure how riders use their time. For some transit systems, fare-paying riders are allowed to transfer to any other bus for up to two hours after payment. Thus, people grouped their errands around particular routes to have more “free” time to go on unplanned errands or engage in leisure activities.

A number of participants also took advantage of fare discounts offered by transit agencies or received fare assistance from charitable organizations. Often, participants discovered these discounts through social service organizations or from their doctors or medical providers. In some cases, they learned about these discounts from their peers. Once aware of discounts or fare support, participants were savvy about taking advantage of them.

I know that kids ride free on Sunday, which is nice. It's great when you don't have extra money and you want to go do something. –Ann

Hopelink (a charitable organization) helps people with medical coupons get bus passes. They send a cab if you have an emergency or need to get a hospital, and for the return trip home. I heard about Hopelink from DSHS (Department of Social and Health Services) or maybe from someone at the doctor's office. A lot of people use them.–Helen

The two studies illustrate contrasting ways in which people show resourcefulness. In the Kyrgyzstan study, the resources tended to be the expertise or support of friends and family. In Seattle, people in our study were resourceful in the way they deployed their expertise,

which was amassed from personal experience and supplemented with existing informational resources from official sources such as social service agencies.

**Implications for research and design for resourcefulness** - Resourcefulness refers to the ability of people to deploy their expert knowledge either to overcome or to exploit structural constraints in ways that are sanctioned and productive. Uncovering resourcefulness during research can be helpful in several ways. First, we can investigate how expert users are maximizing their use of a system. Such an investigation sheds light on the ways that existing structures are being leveraged to support the goals of users. We can use this information to improve systems by incorporating expert users' knowledge and extending that expertise to the broader community. Second, we can seek to understand how expert users develop their knowledge to bring about desired results from available resources. In terms of design, we can investigate the ways in which design can support the accumulation and execution of expertise.

### **Resiliency**

Resilient acts either directly oppose the ways structures are intended to work, or they address gaps in the structures. By being resilient, individuals and groups can achieve desired outcomes even in systems that are not designed to support them.

When traveling in Kyrgyzstan, our team learned both from experience and from participants that there is no official phone directory in Kyrgyzstan. When someone does not know a phone number, that person has three options: Call the understaffed phone line provided by the city and wait for a long time to find a phone number; ask a family member or friend; or purchase a copy of the unofficial phone directory in a local store.

There is a disk that contains the phone company directory information. It is not official, though. It is copied by people who work at the phone company and distributed to friends. You can also buy it in shops that sell CDs for about 150 soms. –Arif

This shadow phone directory demonstrates resilience in two ways. First, the individuals who worked at the phone company saw an opportunity to create and distribute unauthorized copies in order to confront an existing need and to close a gap in the structure, while making a profit for themselves. Secondly, the people who purchased the CD in the stores were being resilient by seeking an information resource that did not exist within the structure itself.

Another example of resiliency was demonstrated by people in the Kyrgyzstan study and related to the ways in which young people used their mobile phones to create private space in romantic relationships. As described earlier, young people in Kyrgyzstan had traditional and sanctioned ways of obtaining more privacy by spending time in public. However, the introduction of the mobile phone created more opportunities for young people to create privacy beyond public spaces and away from parental and family oversight, especially when it comes to romantic relationships. These new opportunities went beyond what was sanctioned within traditional practices.

In the Seattle design ethnography, people had resilient ways to overcome constraints of the transit system. When people who are transit dependent face obstacles that restrict or

thwart their mobility, they demonstrate resiliency by overcoming these challenges in perspicacious ways. We learned that riders had a variety of techniques to avoid paying for a bus ride. These ranged from being simple, such as misrepresenting one's age in order to get a discount, to being complex, such as saving and filing transfer tickets to reuse them on different days. In addition, some riders appealed to the bus drivers for sympathy or charity, while others simply refused to pay by boarding in the free-ride zone and exiting the bus without paying. For transit-dependent riders who are poor, these practices were seen as a necessary condition of using public transportation to get around.

It is clear that the structure of transit is designed to dissuade fare evasion. However, riders in our study had developed tactics to get around these structures. A helpful point of focus here is the relationship between the evasion on the part of the rider and the enforcement on the part of the driver. The driver, as the authoritative face of the transit structure, has the ultimate say as to whether someone can or cannot ride. Therefore, riders who engaged in fare evasion mentioned that a key strategy was to "be honest" and appeal to the driver. Many mentioned that this was often the most effective tactic. The driver's own agency was invoked in these situations. He or she had the ability to enforce the rules of the structure, or to choose not to.

Fare evasion demonstrates the unsanctioned character of resiliency. Our participants were split in their opinions of fare evasion: some thought it was dishonest, while others accepted it as necessary to get by. In some of the groups, fare evasion was an accepted act within their broader community. As the following quotation demonstrates, methods of fare evasion are often learned from other community members.

**I save transfers: every color, every letter. I learned how to do it in middle school. Then, I text or call someone to find out about the transfer [color of the day]. I have between 20 and 30 of them in my collection. I have a friend who has a sandwich bag full of them. –Eleesha**

Eleesha mentioned that she learned about the practice in middle school. She also mentioned a friend who developed a highly organized way to enact this practice of reusing transfer tickets to avoid paying the fare. This example illustrates two qualities of resilience specifically and of agency in general. First, resilient practices are often transmitted within the social network. Second, resilient practices, while unsanctioned by the official system, can be sanctioned within a specific community. Acts of agency are often learned, reinforced, and sanctioned by the social network.

When the two design ethnographies are compared, we can see an apparent contrast in the acts of resiliency. In the Seattle design ethnography, practices of resiliency were visible because the structures in which they were enacted were clearly defined. Acts such as fare evasion are clearly acts that circumvent the ways in which the system was designed to function. In the Kyrgyzstan study, the examples of resiliency were present, but at times, harder to see. This was due to several factors. First, in Kyrgyzstan, the conventions related to what is and what is not sanctioned differed from the conventions in Seattle. For example, bribing governmental officials in Kyrgyzstan was not uncommon and could even be considered a standard practice. So while this may seem like an unsanctioned activity to a Western audience, it existed as an accepted convention and is therefore could be described

as resourceful. In the Kyrgyzstan examples, acts of resiliency occurred to offset gaps that existed within infrastructure or to facilitate culturally unsanctioned activities.

**Implications for research and design for resiliency** - Resilient acts often bring about desired results are often unsanctioned or out of the bounds of existing structures, making it an important area for research. We can look for areas of resiliency in system use in several ways. First, we can look at the unsanctioned strategies and tactics that users employ when a system does not meet their needs. Doing so reveals what unmet goals exist in the system and the extent to which a system does not support users. System designers can then and then improve the system to create sanctioned ways for the system to meet users goals. Second, we can aim to uncover the ways that users conceptualize unsanctioned acts, and we can identify the values that support or suppress these acts. This knowledge is important for understanding how effective the sanctions are within the prevailing structure. With this information, designers are better enabled to make decisions about how a system can support people's key goals and values. Third, as a consequence of understanding resilient acts themselves and the attitudes around them, we can better anticipate the consequences and impacts of changes to the system.

### **Powerlessness**

Powerlessness is a lack of agency: the system or structure forecloses any possibility to act and does not yield results that are supportive of a person's intentions. Examples of powerlessness from the two studies involved transportation challenges and safety.

In Kyrgyzstan, people face a variety of challenges when they try to get around. Since transportation is a key resource that connects people to other resources, such as work, education, and social connections, transportation challenges can have considerable consequences. Most people travel by *marshrutka*, or private minibuses, which are ubiquitous on the streets in Kyrgyzstan. Traveling by *marshrutka* can be difficult: there are no set schedules; there are often not enough vehicles to accommodate riders, leaving many stranded; and stops are not always marked. As a result, some participants struggled to get to where they needed to go on time. Their struggle was compounded if the alternative was to take a taxi, which costs considerably more money and is considered unsafe for women traveling alone. In Kyrgyzstan, Kalima, a young single woman, talked about safety concerns related to traveling to her home village. She was concerned of becoming victim to the traditional practice of bride kidnapping, a real threat in rural villages (Kleinbach & Salimjanova 2007). The powerlessness that Kalima felt in the face of the tradition kept her away from her hometown. When she did go, her fears forced her to keep a low profile so that no one, except immediate family, would know she was there. As mentioned earlier, social networks in Kyrgyzstan play a key role in helping people to overcome challenges in everyday life. Kalima's reluctance to travel home could act to weaken social connections and reduce opportunities to leverage friends and family to help her get by or get ahead. Therefore powerlessness can be seen as both a way to highlight an existing lack of options to act currently, but also precludes the potential to act in the future.

In the Seattle study, the issue of respect was a recurring theme for some of our participants, especially those who were homeless or lived in transitional housing. Participants talked about buses that did not stop, and the homeless riders suggested that this was sometimes because drivers did not respect them.

The way they treat me sometimes ... Drivers should treat [passengers] with respect. If you can't handle people in the public, get another job. They can be rude. - Tim

This lack of consideration in particular reveals a tension that occurs between some transit-dependent riders and the prevailing structure. Specific structures enacted by authority figures—in this case, transit drivers—often perpetuate the values, stereotypes, and injustices of the larger society. As a result, some members are unable to overcome being subjugated by the larger power structures in society.

**Implications for research and design for powerlessness** - The term *powerlessness* captures the instances when people have little or no recourse to overcome constraints. Through research, we can look for moments of powerlessness in several ways. First, we can investigate the ways in which existing systems and its actors reduce a person's ability to act. Second, we should consider the consequences when systems do not work in ways that match users' needs. Finally, it is important to consider how changes in systems impact users' abilities to achieve their goals. We can design in ways that provide users with a variety of options to choose from. Also, it is helpful to consider how it is possible to design systems in ways that empower users. Finally, we need to keep in mind that changes to the system can provide more (or less) autonomy for users.

## PUTTING AGENCY INTO PRACTICE

Organizing agency into the three categories of resourcefulness, resiliency and powerlessness can be useful in a variety of ways. The categories can be used as a framework to analyze data. Furthermore, the categories can be used to evaluate or critique systems and structures, which can be helpful when determining how to improve systems or create new ones. In this section, we will discuss two systems to demonstrate how the categories can be put into practice. The first is the ORCA fare card system in the Seattle region. The second is the mobile directory in Kyrgyzstan.

### ORCA fare system

Transit authorities in the Seattle region are adopting a new fare payment card system. In place of cash, riders purchase a regional pass called ORCA (One Regional Card for All). The intent of this new system is to streamline fare payment across seven transit authorities in the Puget Sound region that provide service via bus, light rail, commuter rail, and ferries. While transit authorities still accept cash, they encourage riders to use ORCA cards instead.

We can apply the framework of agency to this system to examine how the transition impacts the agency of the systems' existing users. The transition to the ORCA system posed

a variety of challenges for transit-dependent riders we interviewed and, in many cases, reduced their agency. For example, when riders pay cash they receive a paper transfer from the driver that indicates how long they can ride other buses before they must pay a new fare, usually two hours. This paper transfer method is imprecise, so riders are often given more than two hours. The fact that a transfer is both a physical artifact and imprecisely issued lets transit-dependent riders use them in resourceful ways. Riders might use transfers to help organize their time. With extra transfer time, riders might run extra errands. Or if they see that they're close to expiration, they might choose to forego taking transit altogether to avoid having to pay fare again. With the new ORCA card, transfers are recorded electronically, and riders no longer receive printed receipts that say when a transfer expires. This constrains them in several ways. Without a paper transfer, riders do not have a reminder of how much time they have left to transfer without paying for another ride. They are less able to make informed decisions about travel plans and are not given a chance either to choose not to ride or to appeal to the driver's compassion. We heard from riders that paying an additional \$2.25 fare is not always possible. Given the choice between paying and walking, some riders would prefer to walk to save money; other riders would see walking as their only option.

Using structuration as a lens, we can see the interplay between the structure-makers of transit—that is, the policy makers, the transit agencies, and the drivers—wanting to correct or reduce fare evasion. For example, the King County Department of Transportation estimates that Metro, the King County Transit Agency, estimates that they lose up to \$3.4 million per year, or 2.4% of total revenue, because of fare evasion (Report on Fare Evasion on Metro Transit). Looking at fare evasion in the light of structuration, we see that when riders evade fares, their actions carry costs that lead to increased fares, which in turn lead to additional evasion. The ORCA card addresses fare evasion, but at the expense of riders' agency: by demanding an exact fare and obscuring transfer information, it limits the choices that riders (and drivers) can make. We strive to look for solutions that can continue to promote riders' agency without exacerbating fare evasion.

To give riders the information that they need, the ORCA card could support SMS messaging. Riders could receive a text message 15 or 30 minutes before a transfer expires. As we learned in our study, transit-dependent riders rely heavily on mobile phones and tend to use text messaging. Among poor riders small amounts of money are important. Instead of paying a full fare to travel only a few miles, riders could send a text message to the ORCA system in order to purchase an extra 30 minutes for \$0.25. Creating an SMS system to access ORCA information would be helpful not just for transfers, but for other transactions, including checking balances and adding money to an account, when linked to mobile banking capabilities.

While we are not arguing that fare evasion, at the levels currently practiced, is sustainable or desired, the ORCA system could have been designed in a way that recognizes the needs of transit-dependent riders, particularly those who are poor. Creating a system that provides incremental purchases, supports mobile (specifically, SMS) access, and gives users access to more information to help them make decisions that allow them to leverage their resourcefulness are all design opportunities for ORCA in the future. The transit agencies hope to gain wider adoption of the ORCA card. Creating features that support the needs of

transit-dependent riders can help increase adoption and, therefore, achieve the goals of both the transit organization and the riders.

### **Mobile directory**

As a result of the research conducted in Kyrgyzstan, several systems were identified, designed, and piloted in the region. One of systems, the Mobile directory, is a socially built phone directory. It is an SMS-based business rating and directory application that allows users either to access a public directory or to create and share password-protected directories with friends and family. This idea came directly from the design ethnography, which detailed the challenge of finding a phone number and showed how people relied on social connections or endured lengthy waits when they tried to consult the under-resourced official phone company. This data led to the design of a mobile social information directory that would allow individuals and social groups to build their own shared information directories. The system supports users' agency by allowing them to be resourceful using the tools at hand—again, a mobile phone with SMS capability—to access important information. The social aspect of the system was designed to leverage the highly integrated social networks that occur within the region. The hope was that the social directory would be used by those who sought information and that these same users would contribute to the directory by adding their information and encouraging others to do the same.

Table 1 below provides a summary of the ways in which agency and the three corresponding categories identified in this work can be used in questions of research and design.

Table 1. Summary of the three categories of agency and questions for research and design.

Agency	Questions for research	Questions for design
Resourcefulness	<ul style="list-style-type: none"> <li>• How do expert users maximize or exploit the use of a system?</li> <li>• How do expert users exploit their knowledge to bring about desired results?</li> </ul>	<ul style="list-style-type: none"> <li>• How can the design support the activities of experts?</li> <li>• How can the expertise of others be designed into the systems or revealed to all users?</li> </ul>
Resiliency	<ul style="list-style-type: none"> <li>• What strategies and tactics do users employ when a system does not meet their needs?</li> <li>• How do users overcome system constraints in unsanctioned or unsupported ways?</li> <li>• How do users conceptualize unsanctioned acts? What are the values that support or suppress these acts?</li> <li>• How would users be impacted if their resilient acts were prevented by a change to the system?</li> </ul>	<ul style="list-style-type: none"> <li>• How can systems be designed to help people overcome constraints in a way that supports their goals?</li> <li>• How will design changes or decisions unearth or foreclose unsanctioned behavior? What are the consequences of doing so?</li> <li>• In what ways can systems be designed to enable opportunities for users to make decisions that support key goals or values?</li> </ul>
Powerlessness	<ul style="list-style-type: none"> <li>• How do systems reduce a person's ability to act?</li> <li>• What are the consequences when systems do not work in ways that match users' needs?</li> <li>• How do changes in systems adversely impact users' abilities to achieve their goals?</li> </ul>	<ul style="list-style-type: none"> <li>• How can systems be designed to provide a variety of options for users?</li> <li>• In what ways can the system be designed to empower users?</li> <li>• How can changes to design provide more (or less) autonomy or freedom?</li> </ul>

## CONCLUSION

In summary, agency, as conceived by Giddens' structuration, is a helpful lens to investigate the needs of resource-constrained populations because it can focus our attention on existing practice in a way that privileges expertise and aims to support the choices of users. Looking at agency as a continuum across the three categories of resourcefulness, resilience, and powerlessness provides an opportunity for researchers and designers working together to evaluate how systems can better meet the needs of a range of users.

## REFERENCES

- Bradbury, A.  
2006 Transport, mobility and social capital in developing countries. *Engineering Sustainability* vol. 159, 2006, pp. 79-86.
- Coffey, A., & Atkinson, P.  
1996 Concepts and coding *Making Sense of Qualitative Data*. Sage Publications.
- Donner, J.  
2005 *The rules of beeping: exchanging messages using missed calls on mobile phones in sub-Saharan Africa*. International Communication Association, New York.
- Glaser, B.  
1998 *Doing Grounded Theory - Issues and Discussions*. Sociology Press.
- Giddens, A.  
1984 *The Constitution of Society*. Cambridge: Polity Press.
- Hanmer, L., Booth, D., & Lovell, E.  
2000 Poverty and Transport. *report prepared for the World Bank in collaboration with DFID, Overseas Development Institute*.
- Kleinbach, R., & Salimjanova, L.  
2007 Kyz ala kachuu and adat: non-consensual bride kidnapping and tradition in Kyrgyzstan. *Cent. Asian Survey*, 26(2), 217-233.
- 2010 "Report on Fare Evasion on Metro Transit," King County Department of Transportation, Metro Transit.
- Salvador, T., Bell, G., and Anderson, K.,  
1999 "Design ethnography," *Design Management Journal*, v10 ( 35-41).
- Sanchez, T.  
2008 "Poverty, policy, and public transportation," *Transportation Research Part A: Policy and Practice*, v42, 833-841.
- Sillito, J.  
2010 Saturate: Simple Collaborative Qualitative Analysis  
<http://www.saturateapp.com/about>

**Emma J. Rose** is a Senior Associate at Anthro-Tech where she helps organizations with a social-impact mission create meaningful user experiences. She recently completed a PhD in Human Centered Design and Engineering at the University of Washington. Her research focuses on designing for digital inclusion, specifically in resource-constrained communities and contexts.

*emmarose@anthro-tech.com*

**Robert Racadio** is a doctoral student in the Department of Human Centered Design and Engineering at the University of Washington and a Research Consultant at Anthro-Tech. His research interests include research methods for resource-constrained environments, mobile technology, and international user experience.

*racadio@uw.edu*