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# Examining and Designing Community Crime Prevention Technology

**Sheena Lewis**  
Technology and Social  
Behavior  
Northwestern University  
Evanston, IL 60208 USA  
sheena@u.northwestern.edu

## Abstract

My doctoral research examines how middle and low socio-economic communities use technology to address crime. To accomplish this, I have conducted ethnographic fieldwork at joint meetings with Chicago communities and police for the past year. I have also conducted an online content analysis where I have collected over 7000 online crime forum posts that are neighborhood-specific dating back to 2004. The results of my research will inform the design of community crime prevention technologies.

## Keywords

community policing; crime; collective action; technology

## ACM Classification Keywords

H.5.m [Information Interfaces and Presentation (e.g., HCI)]: Miscellaneous.

## Introduction

Crime is a major concern for many urban residents. Crime evokes concern for the physical safety and psychological wellbeing of self and others. Research has shown that after violence occurs in a neighborhood, some residents try to protect themselves using tactics that cause isolation (e.g., not going out, buying guns and locks) [3]. Such individual responses to crime ultimately increase fear and decrease feelings of community and safety [3]. Yet, some communities respond by collectively taking action to

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prevent violent crimes from reoccurring, which decreases fear and anxiety of becoming victimized [5].

While criminology research suggests that collective action successfully decreases crime and anxiety, most human computer interaction (HCI) researchers design crime prevention technologies that provide individuals with information to lessen their chances of being victimized [1, 2, 7]. While these crime prevention technologies focus on individuals, little is known about how technology is used to support collective action against crime. What is the role of community technologies in addressing crime? What constitutes a successful design of community crime prevention technology? The objective of my research is to answer these questions.

### Background

Two main crime prevention theories focus on understanding crime causation and prevention: the victimization and social control theories [5]. Victimization theory focuses on understanding crime as events that occur between a potential victim, offender, and the environment [6]. The victimization perspective suggests that crime prevention solutions should provide citizens with information. In criminology, social control theory focuses on understanding communities as opposed to the victimization theory, which focuses on the individual. Social control theory suggests that social interactions influence criminal acts through informal enforcement of social norms [4]. Social control theory suggests that the morals and values of a community are shaped by social norms that are informally communicated, which in turn play a major role in predicting criminal behavior.

While crime and public safety have recently gained interest in HCI, most HCI researchers have taken an

approach similar to the victimization theory - that is, supplying information to individuals. Blom and colleagues [1], for example, created a mobile phone application that allows residents to tag and share areas of the city on a virtual map where they feel unsafe. Satchell and Foth [7] created SPOT and MATE, handheld personal safety devices that provides information about users' safety. Blythe et. al [2] designed a wearable technology that aims to decrease fear in older adults by broadcasting video and audio data to the police. All of these technologies were designed based on the principle that providing information to users would increase feelings of safety and decrease risk of victimization, aligning with the victimization theory. None of these studies, however, focus on communication or the transmission of social norms within a community. My research is one of the first to provide empirical evidence about how local communities use technology to address crime. Additionally, my thesis suggests ways that criminology literature can be used to influence the design of effective crime prevention technologies.

### Research Question

The central question of my doctoral thesis is: *How can technology be designed to support collective action against crime in urban communities?* To answer the central question, I have designed a research agenda that investigates the following supporting questions:

**Technology Appropriation:** What is the current role of technology in supporting urban communities' efforts to address crime? How are local residents currently appropriating technology?

**Community Engagement:** What are similarities and differences in online and offline community crime prevention efforts?

**Design Principles:** What are best practices for designing technology that empowers communities and encourages them to address local issues?

I define crime as physical offenses (not cyber crime) committed [3]. I have chosen to study urban communities because crime, particularly violent crime, is most prevalent in urban areas, and crime prevention is important to quality of life.

### Research Goals and Methods

In this section, I describe the proposed studies that address the above research questions.

#### *Study I: Understanding Technology Appropriation*

The goal of the first study is to understand how technology is currently being appropriated to support community policing, an example of collective action. I conduct a study that combines ethnography and qualitative content analysis. I observe police and community meetings as well as interview citizens and police officers. I also developed a web crawler using Python that retrieves information (i.e., forum post, date, subject, author) that is shared on a web forum created by local residents. Below is an example of an online forum post collected that was written by a local resident to other community members: "*Saw drug dealing on Saturday afternoon @ 2:30 while having late lunch on my front porch. I can identify the car and will look for it now that I know....here's the info: A reddish-maroon Buick (at least 10 yrs old) did a strange move at the stop sign as it was heading south[...] As the Buick went by me there were 3-4 young men sitting - I could not take the license number, but can identify the car again - very shiny!!*" I have analyzed data from Study I using a thematic approach.

#### *Study II: Exploring Community Engagement*

In the second study, I plan to investigate the similarities and differences of online vs. in-person engagement in community policing. I intend to use the online forum data from Study I to gain knowledge about who is participating online and how. Data about in-person participation will be gathered from community-police meeting sign-in sheets and semi-structured interviews of a small sample of those who do participate in the online forums and/or the community-police meetings. The interview questions will ask participants about specific instances where citizens participate (i.e., online or in-person) and what factors influence their decision to select either medium to engage in community policing. I will also ask about times in which residents "silently" participate in the online forums (i.e., read the forum posts but do not contribute), as this information is difficult to collect. The data will be analyzed using a mix of high-level quantitative methods and grounded theory-like reasoning. I have collected most of the data for Study II but am yet to complete the analysis.

#### *Study III: Designing Community Technology*

The objective of this study is to create design principles and best practices for community crime prevention technology that allow residents to engage in problem-solving discussions. In this study, I intend to create and deploy a system with the partnership of local residents. Results from Studies I and II will inform the design of the technology in Study III. The system will be used for three months and will allow different neighborhoods to share information more fluidly. I will measure if/how the system empowers residents to unite and evoke agency. As the details of this study are still being developed, the specific data that will be gathered and the proposed analysis are yet to be determined.

### Expected Contributions

This work makes several contributions to the HCI community. First, this research builds on current knowledge about user online and offline behavior by investigating how technology is used to support community policing. Second, this study provides HCI designers and researchers with principles and guidelines for designing technology that empowers local communities and encourages them to address social issues. Lastly, my research deepens our understanding of the role of technology in supporting collective action within local communities.

### Research Situation

I am a 4th year Ph.D. candidate in the Technology and Social Behavior program at Northwestern University, which is a joint degree in Computer Science and Communication. I have a background in computer science; however, I would consider myself a HCI or social computing researcher. I have gathered online and in-person data from two out of four communities and have analyzed the online data. I am in the process of analyzing if/how technology complements in-person community policing efforts.

There are several areas where feedback would be valued. First, it would be helpful to receive feedback on the mixed method approach that I am using to address my research questions (i.e., interviews, ethnography, qualitative content analysis). Furthermore, it would be helpful to receive recommendations on conducting research with government/political organizations and local communities. Lastly, it would be helpful to receive comments about studying interest-based communities and how to best generalize the results of my topic (i.e., crime) to broader implications.

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