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AUGMENTED CRIMINALITY – HOW MOBILE AUGMENTED REALITY CRIME OVERLAYS AFFECT PEOPLE’S SENSE OF PLACE

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Introduction

Communication about real-life crime and space has long been an important question for sociologists, criminologists, and policymakers alike. With federal laws in the United States such as the Clery Act mandating disclosure of crime around college campuses, there has been a growing trend amongst the police and public watchdog groups to log real-time crime information and present this data to local communities (Buslik & Maltz, 1999; Rich, 2001). The debate over how to best communicate this information to communities, however, has been highly controversial, with some arguing that it motivates members to get involved in the community while others contend that it will stigmatize high crime neighborhoods (Harries, 1999; Wartell & McEwan, 2000). While some earlier work has examined the effectiveness of crime maps as a form of communicating data (Groff, Kearley, Fogg, & Wartell, 2005), this study examines a new form of crime displays, specifically augmented reality crime information.

Augmented reality (AR) is defined by academics as any technology that overlays digital artifacts on the real world that is 3D, real-time, and interactive (Azuma, 1997; Liao,

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2016). In 2010, a crime aggregation company called Spotcrime partnered with an AR mobile browsing company called Layar to display incidents of crime overlaid on the physical place itself (Figure 1).



(Figure 1 – Spotcrime Layar Application)

While one of the ways SpotCrime marketed the AR application to people was to make them feel safer, it may be true that AR could make people feel less safe, more afraid, and change their relationship/perception of those places. Drawing on this real-world application, this study aims to understand 1) how seeing AR crime information might affect people's perception of physical places, 2) how seeing AR crime information might affect people's imaginations about crime, and 3) how seeing AR crime information might affect people's emotional response to that place.

Space/Place

Sociologists and cultural theorists have been theorizing about urban place for a long time (de Certeau, 1984; Lefebvre, 1991; Lofland, 1998), with the understanding that place is socially and culturally produced. For this study, we draw on Lefebvre's (1991) framework for understanding space, that there is a spatial triad for making sense of space. The first is 'representations of space,' which are the physical artifacts that conceptualize space (e.g. maps, blueprints, etc.). The second is 'representational space,' or how people come to understand and refer to that space (e.g. ideals, imaginations, and visions of that space). Lastly is 'spatial practice,' which are people's everyday routines and urban realities that inscribe the space with meaning.

Lefebvre (1991) argues that space/place is produced by complex and dynamic interrelationships between these prongs over time, such that maps and blueprints can intervene and bring to life the buildings that introduce to new spatial realities,

understandings, and practices. Alternatively, spatial practice can change people's 'representational space,' or people's visions and imaginations of that space.

Information and Communication Technology and Space/Place

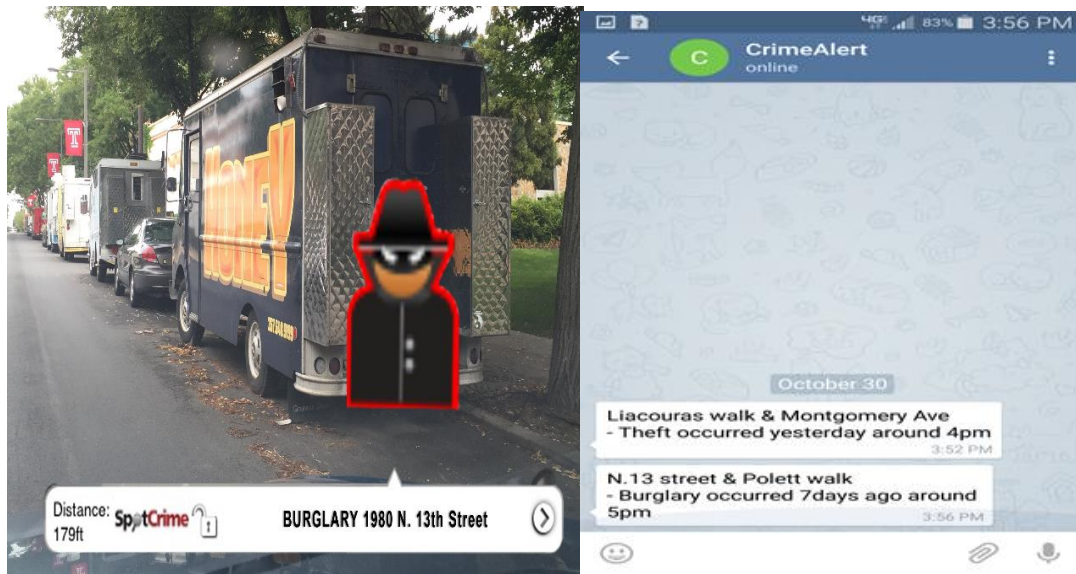
In recent years, there has been a growing recognition that information and communication technologies can mediate people's understanding of space/place (Dourish, 2006; Harrison & Tatar, 2008). Mobile technologies in particular introduce new ways of encountering, navigating, and representing the world that necessitate new spatial logics (Dourish, 2006).

Mobile technologies equipped with geo-location can now introduce additional types of information about place that is not physically there, which can alter the stories that are told about those spaces (Brewer & Dourish, 2008). Urban space can also be embedded with mobile text messages, which allows people to start communicating *about* place as well as *through* place in novel ways (Author, 2011).

AR is an emerging technology that has capabilities that can further complicate our mediated relationship with space. Dourish (2006) notes that: "our interest must be directed towards the ways in which information technologies create new 'virtual spaces' that transcend and overlay the 'real' spaces of the everyday world (p. 304). While there has been some recent research about the possibilities of AR for people to reappropriate space (Liao & Humphreys, 2015), less is known about how people might use this technology to alter their spatial perceptions and experience.

Methods

Participants were randomly assigned to an experimental condition were provided with a smartphone which had an AR mobile application called Aurasma, which we had customized to expose information about crime near a scanned location. A research assistant led the participant to three spots on campus where the AR application would scan the location and display visual crime information of burglaries, theft, and assault. In the control condition, they were taken to the same locations, where they were sent a text message containing the same information (Figure 3). The participants consisted of 80 students from a university on the East Coast of the United States.



(Figure 3: AR Condition – Left, SMS Condition – Right)

At each location the participants were asked to fill out open-ended questions about what they think happened in that place, how they felt about being in that place, and whether that information changed their perception of the place. Qualitative data was sorted based on experimental and control conditions and coded for themes related to how violent they believed the crime to be, whether or not they imagined scenarios of the crime, and their emotional responses to the place.

Findings and Discussion

We found that people in the AR condition were more likely to craft vivid scenarios of the crime and analyze the physical surroundings more carefully. They were also more likely to have strong emotional reactions to the place. These findings are a first step toward understanding the possible effects of AR crime information, as well as to understand more broadly how mobile AR can mediate perceptions of place/space.

Using the language of Lefevbre's (1991) spatial triad, this study found that using AR to merge a representation of space (e.g. maps/depictions of crime) with the physical reality affected people's representational space (ideas about and visions of the space) as well as their spatial practice and everyday perception of that space. Understanding the implications of AR (in contexts that may create negative perceptions of place) is important for communication scholars as well as policymakers more generally, who make up the 'rules' for how these systems get implemented.

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