

Anti-Social Media: Communicating Risk through Open Data, Crime Maps and Locative Media

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ABSTRACT

We present a critical evaluation of a locative media application, *Fearsquare*, which provocatively invites users to engage with personally contextualized risk information drawn from the UK open data crime maps cross-referenced with geo-located user check-ins on Foursquare. Our analysis of user data and a corpus of #Fearsquare discourse on Twitter revealed three cogent appraisals ('Affect', 'Technical' and 'Critical') reflecting the salient associations and aesthetics that were made between different components of the application and interwoven issues of technology, risk, danger, emotion by users. We discuss how the varying strength and cogency of these public responses to Fearsquare call for a broader imagining and analysis of how risk and danger are interpreted; and conclude how our findings reveal important challenges for researchers and designers wishing to engage in projects that involve the computer-mediated communication of risk.

Author Keywords

Risk communication; fear; Critical Design; culture jamming; open data; Foursquare, crime; locative media.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI):

INTRODUCTION

Risk communication is typically understood to encompass the interactive exchange of information, opinions and evaluations by governments and other public and private bodies, to inform, educate and persuade people about health, environmental and technological hazards [20]. The study of risk communication, as well as perception [28], is

cross disciplinary and complex and involves challenges such as how to address scientific uncertainty, resolve ambiguity, and build trust in order to enhance informed debate and decision-making ability to safeguard citizen's health, safety and well-being. The emergence of the computer-mediated communication of risk (CMC-R) through the use of the internet, and especially social media, as a means to deliver risk information by public and private bodies opens further new challenges [18, 31] around the understanding of interactions between technology and its users and how these might be best designed and utilized. Most notably, the public uptake and use of CMC-R significantly transforms the timeliness, variety and availability of risk information, how it is created and circulated, how people might attend to or engage in dialogue about risk, and how risk bearers might be targeted or empowered [10]. This has given rise to warnings (see [4, 10] for instance) that CMC-R will become rife with rumour and false information following unconfirmed word-of-mouth, and that the inherent dynamics and features of new media will amplify fear, anxiety and social fragmentation.

In this paper we focus on one applied area of CMC-R: exposure to crime. Recent engagement by the HCI community with issues around exposure to crime, as well as the design of interactive digital solutions that might communicate such risks of exposure, have typically been framed by relatively simple assumptions of technological and social determinism, and a focus on compliance with political projects (e.g. [2, 26]). In an attempt to deepen understanding of, and generate further dialogue on, issues surrounding public engagement with CMC-R, in this paper we present the design and evaluation of a application, named *Fearsquare*, which provocatively invites users to consider the aesthetic tensions between digital media, crime risks and fears. We first discuss the wider sociocultural and political context of using public data and social media before describing how the tools and concepts of 'critical design', 'hacking' 'cultural jamming' were employed in our study to explore these issues.

BACKGROUND

Crime Risk Fears, Perceptions and Digital Initiatives

The fear of crime is an ongoing risk communication and perception problem. In the UK, for example, crime risk fears and perceptions have risen persistently, irrespective of falls in reported crime rates [12]. Early research questioned why fears and perceptions were disproportionate and subjectively biased when compared to actual crime figures [15]. However, a broader view has emerged over time that recognizes that public responses are framed by a complex matrix of media representations of crime, and moral and cultural expectations, which resonate with personal experiences of law and order [15]. The propagation of crime risk fears and perceptions can thus affect anyone, thereby reducing people's quality of life by raising anxiety, restricting movement, eroding social and neighborhood ties and forming an obstacle to positive orientations towards the environment that are difficult to remove [15].

The HCI community has accordingly experimented with the possibilities of using technology to reduce fear of crime, via the use of *locative media* to help alleviate fear experienced, for instance, amongst older people [3] and children [36], and to promote a sense of personal security amongst citizens in urban settings. In [2] a mobile phone application, was designed to allow users to indicate where, on a shared city map, they felt safe, or unsafe, in a bid to help them better understand their personal safety in and to facilitate preventative measures such as avoiding areas deemed to be unsafe. Subsequent work in [26] also highlighted the use of mobile technology to help users manage their personal safety concerns in urban contexts after dark, but also noted that security had to be balanced against privacy depending on the user.

Crime cartography has historically been employed as a policing tool to help identify crime patterns and target resources accordingly [6]. However, the public release of geo-tagged crime data is a relatively recent initiative, exemplified by the ongoing publication of monthly 'crime maps' by the UK Home Office (see Police.co.uk) beginning in January 2011. This initiative figures as part of the UK Government's 'open data' political program, and aims to make the occurrence of different crimes transparent and accessible for any given searchable location chosen by members of the public. Whilst the Police.co.uk website is not the first attempt to publish crime maps, it is the first to use standardized crime statistics gathered nationwide at street level granularity [6]. Supplementary information is provided to users via the website in the form of graphs and details about local police initiatives providing a novel way for UK citizens to gain greater access to information about crime and crime control measures in their neighborhoods.

Upon its release, the Police.co.uk website drew immense national interest from UK citizens resulting in the site crashing on its first day due to the volume of people trying to access it [29]. Recent figures from early 2013 indicate

that the site still generates around 17,500 unique visits per day [24]. Part of the appeal of the Police.co.uk site rests in the ability to quickly find and easily browse crime data via a simple website interface that allows users to pinpoint crime in areas of personal interest, such as the street on which they live, through intuitive visual navigation of neighborhood maps. This provides a more granular picture of different kinds of locally reported crime than was previously available through generalized year on year statistical crime trends for example, making it easier to see the personal relevance and significance from crime data.

However, the aims and objectives of releasing the digital crime maps online clearly went far beyond simply providing easy access to more detailed information about crime. In a statement of support, the UK Policing Minister claimed the website would give citizens "*the information and power to hold their local forces to account and ensure that crime in their neighborhoods is driven down*" [30]. Like other initiatives such as ConnectedCops.net, the site is intended to enhance the credibility of policing and empower the public by increasing the visibility of police presence, law enforcement and criminal justice, facilitating greater public scrutiny, and engagement. Lending some support to these views, research [22] by the National Police Improvement Agency suggested that citizens were generally positive about digital crime maps which had no overall adverse effect on crime risk fears and perceptions.

Digital Crime Maps and their (Dis)contents

Despite their apparent popularity the online release of digital crime maps has not passed without criticism. This criticism can be grouped according to 'pragmatic criticism', concerning usability and efficacy for example, and 'cultural criticism', which reflects concerns about the aesthetics, social consequences and political utility of making digital crime maps public. From a pragmatic perspective a recent review in [6] argued that, to make crime maps a more effective risk communication tool for public engagement and empowerment, improvements are needed both in the content and precision of crime cartography employed as well as how this is tied to information about what people might do to minimize their risk of crime and engage with the police. The authors concluded that incorporating social media tools could offer one way to better enable dialogue and enhance the personal relevance of crime maps.

By contrast cultural critique notably focuses on the intrinsic aesthetic properties of digital crime maps and questions their political ends and purposes asking what the broader social consequences might be should they be successfully implemented. This critique observes that making digital crime maps public forms part of the broader social and political communication of risk and danger in modern life and its role in supporting a 'neo-liberalist' government agenda. In this view, visualizing the prevalence of crimes in certain areas cultivates an '*aesthetic of danger*' by attaching

risk to those locations and individualizing responsibility for crime prevention for citizens who reside there or visit [33].

However, it remains open to question whether this should be considered truly empowering, in the sense of improving self-determination and agency through greater knowledge and the development of capabilities and proficiencies, or is merely an instrumental means government authorities can use to pass on responsibility for crime control to citizens by alerting them to risks they might face. The cultural aesthetic of danger critique therefore suggests that, irrespective of their early popular reception, the associations of risk to locations made by digital crime maps do not offer a non-problematic empowering solution for addressing crime.

REVERSE ENGINEERING AN 'AESTHETIC OF DANGER'

The critical observations made of digital crime maps suggest that efforts to empower citizens against crime might nonetheless further inscribe upon CMC-R and its users an aesthetic of danger that uncritically privileges certain kinds of political values and effects. This raises difficult questions for designers and researchers about the co-option of CMC-R into ideological political projects and if it is both desirable and inevitable. However, contemporary digital and locative media also often affords possibilities for fluid interpretation, manipulation, simulation and subversion, not merely passive user consumption [26]. This indicates some important scope for both designers and users to play a significant role in reflecting upon and questioning the values that underpin and shape CMC-R design and effects.

Critical Design

Within the HCI community, recognition of the growing cultural significance of technology has led researchers to acknowledge the importance of adopting a contextualised understanding of technology design, use, experience and its consequences [37]. This follows growing concerns that the focus of much previous HCI work has been conservative and limiting because it is designed “*to help produce more effective and efficient machines and perpetuate the social status quo, not find a more effective context for life*” [19]. In a break from this ‘traditionalist’ trajectory, HCI work from a ‘Critical Design’ perspective is envisioned as a means for “*exposing and exploring alternative assumptions about key relationships in our field – the user, the design, interaction, the business or home context, and quality of life now and in the future*” [1]. Critical Design research therefore recognizes that technology is not neutral or value free, but has a social impact that is inscribed with the values of designers and bears the imprints of political and commercial objectives, ideologies and privileges. Following key early thinkers (e.g. [9]) interaction design researchers have thus aimed to illustrate and explore these implications and insights, often proposing or undertaking radical and provocative work, which challenges orthodoxies in order to better understand the impacts of technology [19].

Hacking and Culture Jamming

Drawing on perspectives in cultural studies, the activities of hacking and culture jamming [7] share similarities to the principles of Critical Design. Hacking can be construed as the opportunistic appropriation, and ‘mashing’, of code, design or electronics [13] and we partially focus our own work on that definition. However, in, for example, Jordan’s analysis [17] of hacking and its cultural implications, attention can also be drawn to how hackers embody an explicit denial of technological and social determinism that opens up spaces for political resistance and social change. For Jordan, breaking into systems, and transgressing laws and conventions reflect the pursuit of creativity, value, difference leading to the production of new knowledge and experiences.

Likewise, ‘culture jamming’ is also recognized as a dissident media activity that aims to destabilize and challenge the social order through the transgression of cultural norms, rather than presenting rational opposition or forceful argument [35]. However, unlike hacking, culture jamming primarily involves playing with the aesthetic modalities of a medium, turning normal expectations, images and emotions back in on themselves through acts of rhetorical sabotage. Warner [35] highlights how laughter elicited via parody is one of the most powerful means by which to draw people into political engagement. Presenting provocative counter images within an established media format, such as broadcast news or viral advertising can jolt the viewer into re-examining the dominant branding and messaging of elite political discourse for example.

The basis for our own approach

Following principles of Critical Design, hacking and culture jamming, we thus sought to inquire how a crime map application might be developed which breaks with traditionalist imperatives for research, and design, that prefigures CMC-R, technology, and users, in complicit support of political and commercial utility. Particularly, how might an application might be designed to expose, and draw into question, the role of CMC-R in ‘empowering’ users by cultivating an aesthetic of danger? Whilst there is some clear conceptual coherence to the central premises and ideas of Critical Design there is no widely accepted theory or prescriptive methods for conducting Critical Design research in practice. Rather, principles of Critical Design have been articulated materially through attempts to configure technology and users in ways that might be variously considered ‘human centered’, ‘*spaceful*’, ‘*oblique*’, ‘*playful*’, ‘*provocative*’, and ‘*serendipitous*’ [9]. This is generally underpinned by ethical considerations which uphold the agency of individuals to negotiate their relationship and conduct with technology rather than moralistic considerations that aim to impose certain requirements and restrictions which limit the latitude for interpretation and interaction [19].

A technique employed in culture jamming to similarly provoke interpretative reflection is ‘Socratic’ rather than ‘didactic’ presentation, whereby questions are asked of the ‘audience’ instead of making an explicit statement of intent concerning how something ought to be appraised. This can be achieved through parody by creating a tension between what is said, and how it is presented, that calls into question the substantive claims being made, rather than directly opposing them. Warner [35] argues that effective parodies provide a provocative counter image by playing on and often plagiarizing the aesthetics of a particular media in juxtaposition to the dominant brand or message. This might include using the same format or approximate layout familiar to the viewer for example, so as to initially engender a sense of legitimacy and respectability, which is then interfused with incongruous words and images that intentionally misuse the format. The effective use of parody therefore requires shared cultural knowledge in the sense that one needs to ‘know the rules’ in order to break them and to recognize that they have been broken. This breaking process can be aided [35] by presenting ‘matter out of place’, that is placing obviously incongruous things side by side, back to back, or out of time, rather than simply sermonizing or moralizing. Culture jams thus aim to provocatively expose underlying politics, strategies or assumptions through stealthy disruption and ambiguity not through open hostility.

FEARSQUARE

In this section we first briefly describe the Fearsquare application in functional terms from a user perspective. Drawing on insights and techniques from ‘critical design’, ‘hacking’ and ‘culture jamming’ literatures respectively, we then explain what makes the application design intentionally ‘critical’ rather than simply an instrument of commercial and political value utility.

Fearsquare from a user perspective

Fearsquare is a web application which, first and foremost, incorporates social media functionality into the presentation of crime map data made available by the police.co.uk website. This is primarily achieved by cross-referencing the longitude and latitude of the ten most recent user “check-ins” to venues on the popular location sharing social network site *Foursquare* (retrieved with the Foursquare developer API) with street level crime statistics for those locations (retrieved from the police.co.uk developer API).

Once users have signed into the Fearsquare application, using their Foursquare account, details of the crime statistics associated with each check-in are presented in a simple visual format (see Figure 1). Users are then able to ‘click through’ to the police.co.uk website via a link from the Fearsquare application to examine the crime maps for those specific locations if they wish. The higher degree of personalization that the social media functionality of Fearsquare offers might therefore be considered in a certain

sense as a ‘hack’, but offering a complementary service to both users of the police.co.uk website and of Foursquare by augmenting and extending those services in an innovative way, thus creating a novel experience. The personalization of digital media is also considered as one means by which to empower users [23]. However, this was not the primary objective, or the only way Fearsquare might be interpreted.



Figure 1. Fearsquare shows recent crime data about each location that users have checked into.

Critical Design, hacking and culture jamming

Fearsquare purposely incorporated design elements that were clearly drawn from Foursquare and police.co.uk. However, there are also some clearly contrasting design elements and juxtapositions that work against the normative conventions of both Foursquare and police.co.uk. These are in part directly attributable to the Fearsquare application primarily functioning as a ‘mash-up’ of the two original data sources. That is, certain dynamics, which did not exist before were necessarily introduced as a result of providing an interface between the two data sets. By way of Foursquare check-ins, Fearsquare re-routes the crime data towards more mobile and fluid representations of crime prevalence that reflect day-to-day movement. Specifically, we incorporated categories assigned by the police.co.uk site for crimes against a person, that is ‘Anti-social Behaviour’, ‘Theft’ and ‘Violent Crime’, rather than those that by their intrinsic nature could only take place at a fixed location such as ‘Burglaries’ for example. In this way Fearsquare exposes crimes to scrutiny that are most associated with the routine and transient nature of day-to-day movement not easily ascertained from the police.co.uk site.

Foursquare was considered to be an appropriate platform to utilize in this way because members already commonly employ it as a ‘life-logging’ tool to create a diary of their everyday movement patterns and comment on locations to be shared with ‘friends’ [21]. As users are free to check-in and publicize whichever location they might wish there is also no obligation to use the application in a particular way. This affords agency to the user concerning how and when they might identify their movement and associated crime levels to others.




Most Dangerous People					
Position	Name				FearPoints
1st	Arthur Nudge	96	25	25	9523
2nd	Luigi Vercotti	75	23	46	8734
3rd	Eric Praline	283	0	3	8510
4th	Spiny Norman	119	14	45	7784

Figure 2. Leaderboards implicitly challenge users to visit "dangerous" places.

Perhaps most provocatively, the name “Fearsquare” is purposefully affect laden, which transgresses the norms of how the serious matter of crime data is soberly reported. Further provocation is also built into aesthetic orientation of the application by incorporating the ludic qualities of Foursquare, such as points and leaderboards for check-ins, to invite playful competition through sharing and comparisons with friends. This primarily operates through the contrivance of ‘Fearpoints’, awarded to ‘players’ based on the frequency and severity of crimes committed at the locations they had visited. This adds a sense of reward [8] to crime data for users who may ‘compete’ via the leader board to see “who lives the most dangerous life”. Moreover, by ‘rewarding’ users with points for levels of danger (i.e. crime) in their life (i.e. crime incidents associated with their check-ins) the Fearsquare application inverts the normal preferences that are associated with crime exposure. This incongruity in the associations that might typically be formed between danger, fear and reward is key to the consideration of Fearsquare as a parody, but if this is ‘good’ or not is left open to interpretation. However, as Fearsquare could therefore hypothetically be indirectly interpreted as challenging users to visit places they perceive to be more dangerous in order to score Fearpoints, a degree of opaqueness intentionally surrounds how points are awarded to particular crimes and places relative to others. The awarding of points is also retrospective which further limits the possibility for ‘gaming’ the application directly.

EVALUATION OF FEARSQUARE

Fearsquare was released (at Fearsquare.com), free to use by any interested person, in order that an ‘in-the-wild’ [25] evaluation of people’s natural dispositions towards the application could be undertaken. To raise awareness, the release of the application was publicized through the authors’ private Twitter accounts and by contacting popular technology news sites and blogs, many of which featured Fearsquare in articles and commentaries.

Data collection and analysis

To support our evaluation, data on the access and usage of the Fearsquare site was recorded via the server activity logs between 31 March 2011 and 29 August 2011. FearSquare received 24,290 unique visits, including users from 136 countries, which suggests that the application generated some widespread popular interest. In particular Fearsquare received a large number of unique visits from people in

France (n=6,560), UK (n=4,420), USA (n=4,163) and Brazil (n=2,340); this was despite the application only being fully functional in the UK where the open data crime maps were present. A total of 2,371 users with valid Foursquare accounts logged into Fearsquare (77.4% male, 20.4% female, 2.23% undisclosed).

We also logged Fearsquare related mentions on the micro-blogging social media site *Twitter* for the same period to record public sentiment towards the application at its release. This generated a corpus of 3,522 tweets containing the word “Fearsquare” which concurrently trended as a “top tweet” on Twitter. Tweets were filtered in order to remove a large number of simple re-tweets and tweets generated from widgets on news and blog articles. Tweets were further filtered to remove those not in the English language, and any which directly involved the researchers promoting the project. A final data set of 589 unique user-generated tweets formed the basis for analysis. An inductive thematic analysis was conducted on the data set following the method in [16]. Specifically, 294 of the 589 tweets were read in-depth by one researcher, and category codes were initially identified. These codes were refined upon further reading producing 25 categories, which, together with a description and examples of each code, were given to two other researchers. Two further codes were identified by the other researchers and included in the final agreed coding scheme. All three researchers used this coding scheme to independently code the remaining 295 tweets that had not been used to generate the coding scheme. The coding categories were further cross-referenced with the data and examined for overarching themes identified and reviewed by three researchers and refined by the lead researcher. A number of tweets (n = 8) were deemed too ambiguous to code.

The inductive analysis of the corpus of Fearsquare tweets illustrated a broad range of reactions. We identified three main narrative themes that we assigned the labels ‘Affect’ (n tweets=210), ‘Technical’ (n tweets=32), and ‘Critical’ (n tweets=28) expanded upon below; where tweets are employed to illustrate a theme, the original spelling and grammar is retained whilst usernames have been removed.

Theme 1: Affect

The first theme, Affect, contained three distinct sub-themes termed Neutral Sharing, Positive Sharing, and Negative Sharing. Tweets included in this category involve participants broadcasting the existence of Fearsquare making simple exclamations or comments such as liking or disliking the application. The very fact of sharing provides some indication that users found Fearsquare interesting or useful, or that they thought their followers would, without necessarily endorsing it. Beyond the simple sharing of tweets we identified sub-themes relating to neutral, positive and negative commentary that allow us to expand further upon people’s views or experiences of the application.

Subtheme 1: Neutral Sharing

Over one third of all tweets analysed (n=118) fell into this sub-theme, which describes tweets that contained some identifiably user-generated content that went beyond simply a link to the project URL, or a related blog URL, but was neither obviously positive nor negative. These tweets also did not describe the project in any great detail; for example: *"First there was Foursquare, now, Fearsquare"*, *"Foursquare + crime = Fearsquare"*, *"Read this tweeps!"* and *"What does everyone think of Fearsquare?"*. As with simple retweets, the act of sharing might be an indication of interest or engagement with the project, but it is difficult to discern anything beyond this.

Subtheme 2: Positive Sharing

This category describes tweets (n=63) that shared links to, or information about, Fearsquare in an overtly or explicitly positive manner. Many of these tweets emphasized the novelty, creativity and fun of the application: *"This looks pretty cool"*, *"Genius"*, and *"Brilliant fun! How ghetto are your fave spots"*. Tweets in this category emphasize approval of the concept of Fearsquare regardless of whether they had used the application or just read about it: *"This looks pretty cool.....I don't have a foursquare account to check it out tho"*. A number of posters specifically mentioned that they found the application interesting: *"Fearsquare - interesting mass participation study into perception of crime"*, *"Way more interesting than Foursquare"*. On face value, these tweets imply a positive reaction on the part of users, but do not indicate what particular aspects users liked or found interesting. However, some tweets did focus on pragmatic value: *"Just when I thought #foursquare was annoying, this might prove useful"*, *"fearsquare looks like a useful service"*, and *"Well that actually sounds useful"*. These posters were positive about the utility of the application with respect to seeing crime statistics for the places that they commonly visited. Indeed, one tweeter commented: *"Fearsquare just makes me want an app that maps me a 'path of least robberies' for walking home at 2 a.m."* This suggests that some people do find the development of crime safety applications to be of pragmatic value without necessarily feeling undue concern about any undesirable consequences. A number of people also posted tweets that specifically identified the humorous aspect of the application: *"I wonder if the criminals get badges too :-)"*, *"Check in and never check out, brit humor at his best"*, *"LOL can't wait to use it"*. These tweets suggest that some users noted and particularly enjoyed elements of parody employed in the design.

Subtheme 3: Negative Sharing

A group of tweets (n=29) expressed a negative sentiment towards Fearsquare: *"Its called Fearsquare, not a nice name"*, *"'Fearsquare' doesn't really create a helpful impression"*, *"lets see that death and carnage on our streets. Sheesh"*, *"Fearsquare? 'Sounds more like a social media horror movie to me...'"*, and *"Has it really come to this?"*. However, beyond these general objects other tweets

more explicitly expressed reservations about the effects of seeing the crime data provided by the application: *"If I was using Fearsquare, I don't think I'd go anywhere"*, *"I don't think I want to know"*, *"I was afeared of this"*, *"Maybe I'll stay in tonight"* and *"think i'd rather forgo how many crimes have taken place where i check in"*. These tweets indicate the potential for concern alarm, and annoyance arising from the risk related aspect of the application. Another group of tweets specifically criticized the negative individual and sociocultural aspects of this: *"More fuel for paranoia"*, *"Just to make you more paranoid here's Fearsquare"*, *"Is aptly named Fearsquare the start of a darker, antisocial media?"*, *"Infusing a daily dose of fear into your social media"*, *"Go fear culture, go!"*, *"Another possibility to waste your life being scared"* and *"This.....makes me an anthropophobe"*. The observations and fears expressed here indicate clear concerns held by some over 'irresponsible' application development and the potential downsides of making government crime data publicly available. These responses suggest that the subtle Socratic style of parody used in the Fearsquare design could have been either missed or dismissed by some

Theme 2: Mechanical Discussion

Tweets described as 'mechanical' (n=32) concern the technical features of the application, how it works, and personal experience of using it. A number of users simply shared their score with their twitter followers: *"I just scored 868 FearPoints"*, and *"I scored 2682 fear points on Fearsquare :/"*. This suggests that some users found the application and its scoring system engaging or informative. In other tweets people made inferences about their check-ins: *"I should check-in in less scary places!"*, *"Ah thanks, most dangerous place I've checked in is... my house"*, *"According to Fearsquare, there have been 2 violent crimes at [blanked for anonymity]"*, *"According to Fearsquare.com, the most dangerous place I've been is [blanked] in London"*, *"Oh dear. I scored 1416 FearPoints on..... All future social engagements are now cancelled"*. A number of people also speculated over what they would learn from using Fearsquare were it to be available in their own locality: *"Wonder how this'll work in HK"*, *"System will EXPLODE in the Phils"*, *"Glad I don't 'check-in' often in Wilmington. Potentially depressing..."*, and *"the stats will prob b off the charts in South Africa if we get it HAHA!"*. Others explicitly expressed the wish to have the application where they lived: *"Wish they had this in the US!"*, *"wish I was across the pond to try it!"*, *"U.S. NEEDS this for the safety of all you geo-locating fiends"*, *"UK based only"* and *"its UK only"*. These tweets indicate the desirability of the application beyond its use in the UK, particularly in places where crime is a salient issue.

Theme 3: Critical

This theme describes tweets (n=28) that either discuss how Fearsquare has facilitated wider critical reflection or prompted introspection about crime, open government data and location based services: *"Been thinking about the*

unintended consequences of crime stats lately. Fearsquare is a brilliant project about that”, “Glad I'm not living in neighbourhood with lot of reported criminal acts according to #Fearsquare, and have to apply for a job”, and “Despite the name, #Fearsquare emphasizes the rarity of crime”. Some tweets specifically reflected on the type of data made available through the crime API, suggesting that the very release of this data demonstrates a discriminatory bias: “Nice service would #Fearsquare be, when it made public 'white collar' crime -> discriminating, only visualising 'street crime'”, and “Ethical question about #Fearsquare - certain crimes are made public via awesome apps, a lot of crimes stay hidden”. Other tweets critically reflected on how location-based services might be problematic: “if this get more popular, i can see crime stats including GPS and social media in their reports. ARGHHH!”, and “Ironic really with checkins publicising your absence”. Some tweets further demonstrate unease at the aims of Fearsquare and uncertainty over its value or contribution: “Not sure this is the best example for open data, but it's amazing what public data allow”, “Tool or Terror? #BeingAware”, “Cool but scary”, “Creepy but good”, “Haha! Wait...creepy”, and “not sure the British Crime Survey people will like the title”. This evidently demonstrates that the application provoked some wider critical reflection and pause for thought amongst some users.

DISCUSSION AND CONCLUSION

The growing momentum behind the release of government open data, and the increasing adeptness of developers at exploiting technologies to personalize risk information tailored to people's environments and interests requires critical reflection on the public reception and appraisal of the emergence of CMC-R as an instrumental political tool. The design and release of Fearsquare created a timely opportunity to evaluate, and critically reflect upon, aspects of the social and political imperatives and consequences of interaction design, experience and public appraisal more generally. Particularly, our analysis of public use and engagement with Fearsquare illustrated three main types of appraisal indicating that different aspects of the application were salient to different people, perhaps reflecting the different personal and cultural resources they could draw upon to appraise the application and their dispositions to the media and medium of CMC-R. This primarily followed users' sharing their affective appraisal of the idea of application to their followers, even amongst those people who seemingly had not yet used the application. This indicates that they had formed an intuitive impression of Fearsquare perhaps based on what they had read on news articles and blog posts or viewing the application via the website. This appears to be a growing trend as researchers release digital applications, featuring deliberately provocative design, for general public use and appraisal (see [32]). This is also, perhaps, in part a reflection of the common form and function of the medium of Twitter as a broadcast tool. One simple interpretation might then be that

this intuitive affective response illustrates the power and popularity of risk and fear as contextual frames to gain the attention of networked publics, and thereby further cultivate a generalized state of fear and anxiety [4]. If interpreted in this way the CMC-R might simply attach stigma or reinforce stereotypes of people and places by acting to strip out the further social context, as has been suggested of crime maps. Conversely, however, Fearsquare was clearly successful in engaging users for a variety of reasons, including, humour and novelty as well as provoking reflection on important societal issues regarding ethical, social and psychological questions underlying interaction with technology and open government data. Our observations of tweets of this, more critically engaged, nature demonstrated that some users were prompted to reflect more deeply and concertedly about the wider issues resulting from use of Fearsquare, digital crime maps and CMC-R. We believe that the incorporation of Critical Design, hacking and culture jamming in the design was helpful to people in enabling the formation of these associations, and that this study is helpful by specifying how tools and concepts of critical design, hacking and culture jamming might be gainfully employed in concrete applications. Which is to say rather than stripping context away from crime, they infused crime maps with the rich personal context of biography based on the places where people had already visited and other cultural associations. We conclude that it is important for designers to recognize that CMC-R design necessarily embodies certain assumptions about the causes of threat and harm, and about the ability of those whom might be exposed to their consequences to do something about that threat. The uses and impacts of CMC-R are highly contingent however, and are strongly shaped by the growing complexity of aesthetic dispositions and contexts in which it is embedded, leading to fluid interpretations of new tools and practices of CMC-R, risk, and danger which have yet to emerge.

REFERENCES

1. Bardzell, J. Interaction Criticism and Aesthetics. In *Proc CHI 2009*. ACM Press (2009), 2357-2366.
2. Blom, J. Viswanathan, D., Go, J., Spasojevic, M., Acharya, K., and Ahonius, R. Fear and the City – Role of Mobile Services in Harnessing Safety and Security in Urban Use Contexts. In *Proc CHI 2010*, ACM Press (2010) 1841-1850.
3. Blythe, M.A., Wright, P.C., Monk, A.F. Little brother: could and should wearable computing technologies be applied to reducing older people's fear of crime? *Personal Ubiquitous Computing* 8, (2004), 402-415.
4. boyd, d. The power of Fear in Networked Publics. At *SXSW2012* Austin Texas, March 10 2012
5. Burchell, G., Gordon, C., Miller P, eds. *The Foucault Effect: Studies in Governmentality* (1991).

6. Chainey, S. Tompson, L. Engagement, Empowerment and Transparency: Publishing Crime Statistics using Online Crime Mapping. *Policing: A Journal of Policy and Practice*, 6 (2012), 228-239.
7. Dery, M. Culture Jamming: Hacking, Slashing and Sniping in the Empire of Signs. *Westfield: Open Magazine Pamphlet Series* (1993).
8. Deterding, S., Dixon, D., Khaled, R., Nacke, L. From game design elements to gamefulness: defining "gamification". In *Proc of MindTrek 2011*, (2011) 9-15.
9. Dunne, A. and Raby, F. *Design Noir: The Secret Life of Electronic Objects*. Birkhauser (2001).
10. Freberg, K. & Palenchar, M. J. Convergence of Digital Negotiation and Risk Challenges: Strategic Implications of Social Media for Risk and Crisis Communications. In *Social Media and Strategic Communications*, Ed Noor Al-Deen & Hendricks (2013).
11. Gerbner, G. Violence and Terror in and by the Mass Media, in M. Moore (ed.) *Against the Mainstream: The Selected Works of George Gerbner*, (2002) 260–74. New York: Peter Lang.
12. Gray, E. Jackson, J. Farral, S. Feelings and Functions in the Fear of Crime: Applying a New Approach to Victimisation. *British Journal of Criminology*, 51 (2011), 75-94
13. Hartmann, B., S. Doorley, and S. R. Klemmer. Hacking, Mashing, Gluing: Understanding Opportunistic Design, *IEEE Pervasive Computing*, vol. 7(3) (2008) 46-54.
14. Hirshberg, P. Merging Art and Technology to Improve the World (2010) <http://www.youtube.com/watch?v=hxnsIXHFhzA>
15. Jackson, J. Introducing Fear of Crime to Risk Research. *Risk Analysis*, 26 (2006), 253-64
16. Jamison-Powell, S., Linehan, C., Daley, L., Garbett, A., and Lawson, S. I can't get no sleep: Discussing #insomnia on Twitter. In *Proc CHI 2012*, ACM Press (2012) 1501-1510.
17. Jordan, T. Hacking and Power: Social and Technological Determinism in the Digital Age. *First Monday* 14(7) (2009).
18. Krinsky, S. Risk communication in the internet age: The rise of disorganized skepticism. *Environmental Hazards* 7 (2007) 157–164.
19. Light, A., HCI as Heterodoxy: the Queering of Interaction Design. In CHI 2010 Workshop on Critical Dialogue: Interaction, Experience & Cultural Theory.
20. Lundgren, Regina G. *Risk communication: A handbook for communicating environmental, safety, and health risks*. Battelle Press (1994).
21. Lindqvist, J., Cranshaw, J., Wiese, J., Hong, J., and Zimmerman, J. I'm the mayor of my house: examining why people use foursquare - a social-driven location sharing application. In *Proc CHI 2011*. ACM Press (2011) 2409-2418.
22. NPIA. (2011). The Impact of Information about Crime and Policing on Public Perceptions. The Results of a Randomised Controlled Trial. National Policing Improvement Agency.
23. O'Leary, K., Wobbrock, J., O., & Riskin, E. A. Q-Methodology as a Research and Design Tool for HCI. In *Proc CHI 2013*. ACM Press (2013) 1941-1950.
24. Police.UK Website Analysis. <http://bit.ly/1eIgFC4>.
25. Rogers, Y. Interaction design gone wild: striving for wild theory. *Interactions* 18(4) (2011) 58-62.
26. Satchell C. and Foth M., Welcome to the Jungle: HCI After Dark. *Ext. Abstracts CHI 2011*, ACM Press (2011), 753-762.
27. Skins, L. Responsibility, rhetoric and reality: Practitioners' views on their responsibility for crime and disorder in the community safety partnerships. *British Society of Criminology Conf Proc*, 6 (2003) 1-18.
28. Slovic, P. *The Perception of Risk*. Earthscan (2000).
29. The Guardian. Online crime maps crash under weight of 18 million hits/hour. 1 Feb 2011. <http://bit.ly/18szPIO>
30. UK Government Press Release. Police Performance Under the Spotlight. 28 Oct 2011. <http://bit.ly/151iQqL>
31. Veil, R.S., Buehner, T. & Palenchar, M.J. A Work-In-Process Literature Review: Incorporating Social Media in Risk and Crisis Communication. *J of Contingencies and Crisis Management*, 19 (2011) 110–122.
32. Vines, J., Thieme, A., Comber, R., Blythe, M., Wright, P., and Olivier, P. HCI in the press: Online public reactions to mass media portrayals of HCI research. In *Proc CHI 2013*, ACM Press (2013) 1873-1882.
33. Wallace, A. Mapping City Crime and the New Aesthetic of Danger. *Journal of Visual Culture*, 8(1) (2009) 5-24.
34. Wardman, J. K. The constitution of risk communication in advanced liberal societies. *Risk Analysis*, 28(6), (2008) 1619-1637.
35. Warner, J. Political culture jamming: The dissident humor of The Daily Show with Jon Stewart. *Popular Communication*, 5(1) (2007) 17-36.
36. Williams, M., Jones, O., Fleuriot, C., and Wood, L. Children and emerging wireless technologies: investigating the potential for spatial practice. In *Proc CHI 2005*, ACM Press (2005) 819 – 828.
37. Wright P, McCarthy J. *Experience-centred Design: Designers, users, and communities in dialogue*. New York, USA: Morgan Claypool, (2010).