

Tuning into the World: Designing Community Safety Technologies to Reduce Dysfunctional Fear of Crime

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ABSTRACT

Platforms like Nextdoor and Citizen can increase users' fear of crime by broadcasting frequent, local, and personalized information about potential safety risks. These platforms can contribute to a *dysfunctional fear of crime*, which undermines a person's quality of life and mental health without actually making them feel safer. In this work, we conducted a mixed-methods study to understand the potential for design to foster a *functional fear of crime*, which motivates precaution without negatively impacting quality of life. We first interview individuals with a dysfunctional fear of crime and then validate interview results with a survey. Through this process, we identified five strategies for designers to support users in developing a more functional fear of crime. These strategies surface overarching theoretical and design implications for designers and researchers of safety platform with the ultimate goal of supporting safety, quality of life, and mental health for users of these platforms.

CCS CONCEPTS

• Human-centered computing → Empirical studies in HCI.

KEYWORDS

safety, crime, community safety, safety technologies, social media, fear, anxiety

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1 INTRODUCTION

Fear of crime is defined as a “diffuse anxiety about risk” [27, p.364]. The criminology literature differentiates between *dysfunctional fear* which erodes quality of life, and *functional fear* which motivates routine caution in ways that does not erode quality of life [28, 31]. A fear of crime becomes dysfunctional when it drives individuals to structure their lives and behavior in order to manage their fear, for example by avoiding all public transportation or staying indoors at night [13, 28, 31].

Prior work shows that mass media can distort the public's perceptions of victimization risk and contribute to a dysfunctional fear of crime [28, 58]. Newspapers and television, for example, consistently present the world as rife with crime by disproportionately focusing on violent incidents and using sensational reporting styles [44]. Scholars have found similar patterns of sensationalism and misrepresentation on community safety platforms such as Nextdoor, Amazon Neighbors, Citizen, and Facebook neighborhood groups where co-located groups of people share safety and security-related concerns [8, 30, 34, 55]. Chordia and colleagues, for example, found that heightened awareness of local safety incidents on Citizen created the impression that crime is around every corner, resulting in “paranoia”, investments in tasers and guns, and fear of unhoused individuals living nearby [8]. Recent work has documented how community safety platforms benefit from these misrepresentations, as users' fear can be monetized through increased engagement, access to data, and in-app purchases [8].

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Although it is clear that digital platforms mediate individuals' perceptions of safety and can contribute to a dysfunctional fear of crime, it is less clear how specific design decisions influence users' perceptions or how designers might instead support users in developing a *functional fear of crime*, which motivates routine caution in ways that does not erode quality of life [28, 31]. Functional fear is described as a healthy state which motivates appropriate behavioral responses to fear that are not overly restrictive, but are also not reckless in the face of danger, such as locking doors or windows and avoiding active crime sites [13, 28]. Understanding how the design of a platform can support a shift from a dysfunctional to a functional response is critical as dysfunctional fear can prevent engagement in routine activities, impacting psychological well-being and quality of life [68]. Additionally, dysfunctional fear can discourage social interactions, contributing to mistrust, isolation, and withdrawal from urban life [13, 48]. Finally, excessive fear of crime in the United States is not expressed neutrally and can lead to stereotyping and profiling of Black Americans [8, 73]. Given that designers of community safety platforms have the power to influence users' mental health, the quality of their everyday lives, and their relationships with their neighbors, we ask:

RQ1: What technological designs have the potential to contribute to a dysfunctional fear of crime?

RQ2: What technological designs have the potential to support users with a dysfunctional fear of crime in developing a more functional fear of crime?

To answer these questions, we conducted a mixed-methods study collecting data from individuals who have a dysfunctional fear of crime and can speak to both research questions. We first interviewed residents of a neighborhood in Atlanta, GA to understand the influence of discrete design decision on fear within a specific context. We then validated these interview results by surveying a national pool of individuals who also struggled with a dysfunctional fear of crime. This work contributes five concrete design strategies that reveal insights about the influence of digital technologies on users' perceptions of risk and provide nuance to HCI discussions on fear of crime. We also discuss theoretical and design implications of this work, identifying key priorities for designers of safety technologies interested in supporting a functional fear of crime. Finally, we reflect on existing criminology theories, highlighting both their relevance and their limitations for HCI research.

2 RELATED WORK

2.1 Theorizing the Fear of Crime

The fear of crime consists of three dimensions: cognitive, affective, and behavioral [18]. The cognitive dimension reflects the rational thought processes around risk calculations, the affective dimension captures the emotions associated with fear, and the behavioral dimension captures the actions that result as a response to fear [20]. The fear of crime affects far more people than crime victimization itself and can have widespread negative effects on individual and collective wellbeing. Fear of crime can erode quality of life [31, 32, 68] and contribute to poor mental health, including anxiety and depression [23, 28]. At a societal level, the fear of crime can harm social trust, inter-group relations [29, 32, 40] and influence policies around policing and punishment [5]. Experimental research, for

example, has documented how media misrepresentation around crime can increase public support for punitive policies, such as the death penalty [5].

Fear is also a primary human emotion which motivates precautionary behavior essential for survival [51]. Prior literature from criminology differentiates between dysfunctional and functional fear of crime [28, 31]. While dysfunctional fear motivates behavior that reduces quality of life without actually helping individuals feel safer, functional fear motivates behavior that helps individuals feel safer and does not reduce quality of life. Both dysfunctional and functional fear are subjective measures, based on individual self-assessment [28, 31]. Functional fear, however, is relatively uncommon; a large survey deployed in London by Gray and colleagues found that 27% of the sampled population struggled with a dysfunctional fear of crime while only 8% had a functional fear of crime [28].

Fears are not static and can become more or less functional due to people's perceptions of their environment. The Disorder, Indirect Victimization, and Social Integration Theories are three theories from criminology that describe how our perceptions of our social and physical environment contribute to a dysfunctional fear of crime [38, 39]. In this study, we leverage these theories to identify design decisions that can either heighten dysfunctional fear or support a more functional fear of crime. Here we provide a brief description of each theory:

- *Disorder Theory*: an environmental theory which contends that there is a positive relationship between dysfunctional fear of crime and people's perceptions of the social and physical characteristics of their environment [12, 38, 53].
- *Indirect Victimization Theory*: a demographic theory which explains that increased exposure to victimization events, even indirectly through media or interpersonal communication, heightens dysfunctional fear of crime [38, 60].
- *Social Integration Theory*: a social theory which hypothesizes that individuals who believe they reside in communities with strong social networks where people and institutions are willing to intervene on behalf of the common good experience less dysfunctional fear [24, 29, 39, 60]. In contrast to the Indirect Victimization and Disorder Theory which discuss facilitators, or factors which contribute to heightened fear, the Social Integration Theory discusses inhibitors, or factors which improve the sense of safety [20].

While these theories describe how users' perceptions of their environment influences fear of crime, they do not take into account the ways that digital technology mediates that perception. HCI thus has the potential to contribute to more nuanced understanding of these theories.

2.2 Digital Representations of People, Places, and Risk

HCI researchers first began investigating the potential for technology to support a sense of safety in the early 2000s. This early work investigated the use of wearable technologies and mobile phones to create a sense of safety for vulnerable populations by communicating information about risk to friends, family members, and local authorities [2, 3, 41, 65, 72]. Blythe and colleagues, for

example, sought to decrease fears of the elderly by designing a wearable web cam that could share video and audio data with the police or community members in real-time [3], and later, Satchel and Forth designed a personal tracker for rural miners that would alert friends and colleagues in case of an emergency [65]. This early work increased users' sense of safety by enhancing their perception that there is a community of people invested in and monitoring their safety.

Digital innovation led to the development of place-based social networks like Nextdoor, which afforded users the ability to create, share, and consume hyper-local safety-related information. HCI researchers in this space explored information sharing practices on these community safety platforms [14–17, 62], and reflected on how such practices create complex representations of people and places. Even while enabling collective sense-making [56] and contributing to communal problem-solving [33, 43], these technologies engender what communications scholar Aurora Wallace refers to as an “*aesthetic of danger*” [70]. Namely, digital platforms shift users' representations of place, associating risk with specific locations in increasingly personalized ways [21, 36, 70]. Kennedy and Coelho describe how safety platforms like Nextdoor and bSafe overwhelmingly report incidents occurring near the home by strangers, creating social mistrust [34], and Chordia and colleagues find that the map on the Citizen app creates a representation of the neighborhood as dangerous and crime as routine [8]. Distorted representations from online safety platforms can be particularly stressful for users because they place the responsibility of managing the risk associated with that representation on individuals [70].

In 2000, sociologist Mark Warr asked readers to imagine a “*magic dial through which we could control or regulate fear of crime in the United States*” [71]. In many ways, digital technologies have become this “magic dial,” creating representations of people and places that can radically shift users' perceptions of risk and their sense of safety. In this study, we ask how specific design decision contribute to these shifts. We depart, however, from binary thinking that aims to increase or decrease fear and add nuance to this discussion by asking how the dial should be “tuned” to support users in developing a healthy and functional fear of crime that motivates caution without negatively impacting quality of life [67].

3 METHODS

Data collection for this study occurred in two stages. We first conducted interviews with residents of a neighborhood in Atlanta, GA who had a dysfunctional fear of crime, as defined by Jackson and Gray [31]. We then validated the interview results by deploying a survey to a larger pool of individuals who also struggle with a dysfunctional fear of crime.

3.1 User Interviews

The research team conducted 16 semi-structured interviews with residents of a single neighborhood, following the guidance of prior research that has shown the usage of safety technologies varies based on neighborhood characteristics and local concerns [16, 17, 63]. A convenience sample was used to select the neighborhood; we recruited all participants from East Atlanta Village (EAV) due to the first author's access to residents and background knowledge

about the area as she resides in the area. East Atlanta Village is a racially diverse neighborhood in Southeast Atlanta. According to the 2020 USA Census, it has a population of roughly 3,000 people. Historically, a Black neighborhood, EAV's racial demographics have changed drastically in the past two decades due to gentrification and population growth [35]. White people now make up the largest percentage of the neighborhood at 48.56%, followed by Black or African American population at 30.25%, and 18.95% Asian population [11]. In the early 2000s, Atlanta had one of the highest rates of violent crime in the USA. Although crime rates have largely decreased since the 2010s, violent crimes such as homicides, aggravated assaults, and shooting incidents have gone up in recent years [54]. Recruitment for this study occurred in the midst of this crime spike as well as city-wide debates over a new jail, protests around a police training facility, and a series of high visibility shootings of Black men at the hands of police and White vigilantes [19, 52].

3.1.1 Interview Protocol. The interview protocol had two components: 1) reflection questions about participants' current usage of safety platforms, and 2) questions about how the design of a safety platform could either heighten dysfunctional fear or support a more functional fear of crime (see Appendix A for the interview protocol). To scaffold participant feedback, we identified key design decisions from existing safety applications and lightly refined views from these apps to obscure the branding, anonymize, and focus the user's attention on the design in question. We identified these key design decisions from five existing community safety applications: Neighbors, Citizen, Mobile Patrol Public Safety, Nextdoor, and Life 360. We chose safety platforms that are popular on the Google Play Store, and identified features in these existing systems that could influence fear of crime based on our theories of change. For example, the Disorder Theory predicts that the infinite scroll feature can heighten dysfunctional fear of crime by contributing to the perception that the environment is rife with crime. The Indirect Victimization Theory predicts that features which heighten the salience or visibility of a safety-related incidents contribute to fear by heightening users awareness of their vulnerability. The Social Integration Theory predicts that design decisions such as a Help Map, which contribute to the perception that people are willing to help on another or intervene on behalf of the common good, can support a functional fear of crime (see Figure 1).

3.1.2 Participants. Participants for our study were required to be above the age of 18, live or work in EAV, use community safety platforms to learn about local crime and safety, and report a dysfunctional fear of crime. We used Jackson and Gray's empirically-validated questionnaire in order to categorize potential participants as Unworried, Dysfunctionally Worried, or Functionally Worried [31], and then invited those who were categorized as Dysfunctionally Worried for interviews. Participants were categorized as:

- *Unworried* if they were unconcerned about crime using standard measures (e.g. “How worried are you about falling victim to burglary, etc?” not very, not at all)
- *Dysfunctionally Worried* if they were “very” or “fairly” concerned about crime and their quality of life was reduced by that concern or by the precautions they take because of

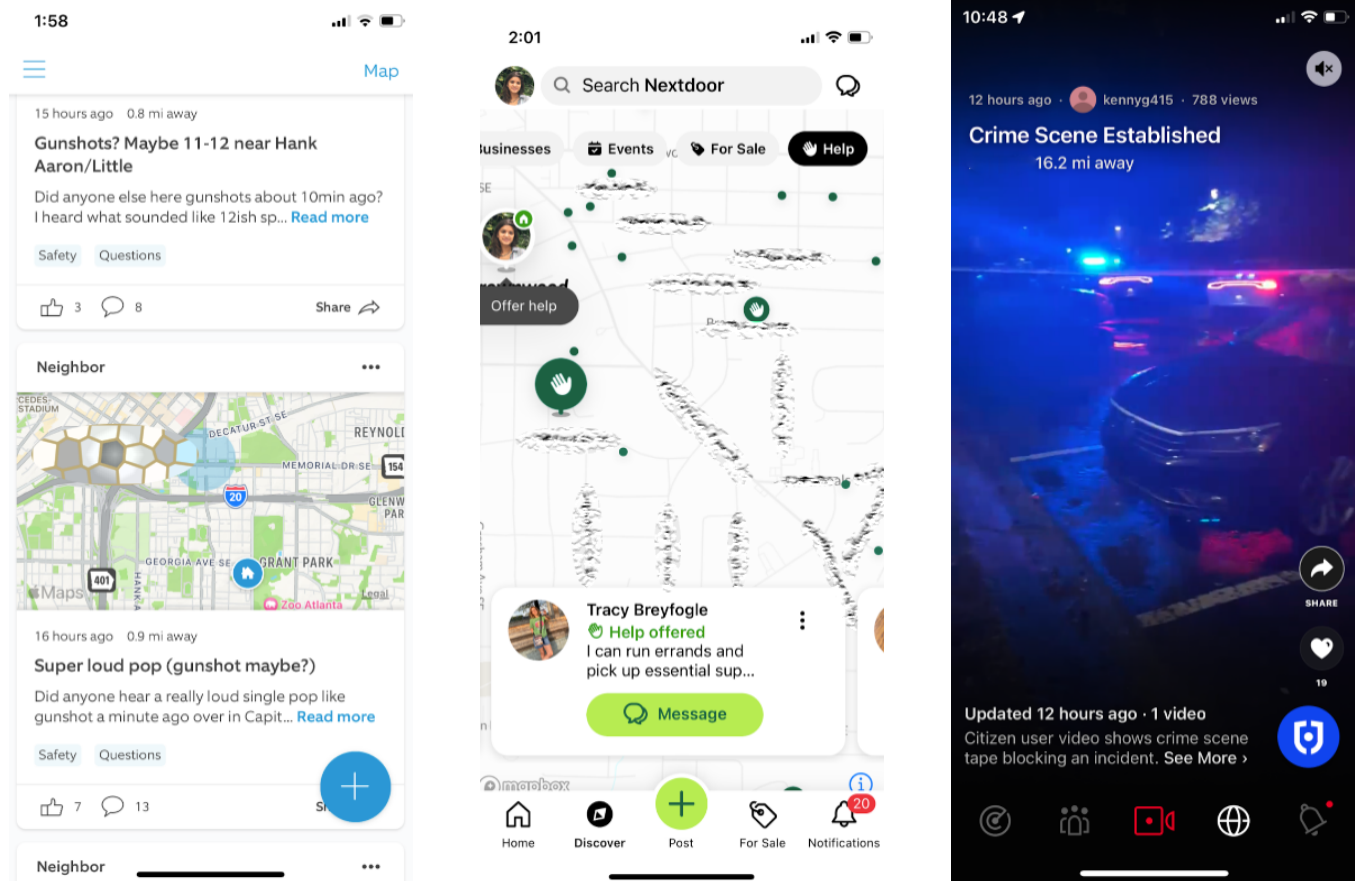


Figure 1: This figure demonstrates three different design decisions that have the potential to influence a dysfunctional fear of crime: a) the Disorder Theory suggests that infinite scroll on the Neighbors app can heighten fear by contributing to the perception that the environment is rife with crime; b) the Social Integration Theory suggests that the Help Map on the Nextdoor app can decrease fear by contributing to the perception that people in the area are willing to help one another; and c) the Indirect Victimization Theory suggests that graphic videos from the Citizen app can heighten fear by increasing the salience or visibility of safety-related incidents.

their concern. We measured precautions by asking questions about avoidance and protective behaviors.

- *Functionally Worried* if they were “very” or “fairly” concerned about crime, but their quality of life was not reduced by that concern or by the precautions they take because of their concern. Additionally, to be characterized as functionally worried, the precautions they take must help them feel at least “a little” safer. This suggests that their concern motivates healthy, cautionary behavior that supports their sense of safety without negatively impacting their quality of life.

We note that this categorization is subjective and similar behaviors may produce different categorizations for different individuals. Jackson and Gray, however, find that this subjectivity offers the greatest confidence because “*the individual in question is best placed to take a view on his or her behaviours, as well as to understand the effects of his or her behaviours and worries on quality of life*” [31, p.7].

To recruit users, we posted a screener survey on the EAV neighborhood Nextdoor page, a local Atlanta Reddit page, and the EAV Facebook neighborhood group, as these are sites where there is prior evidence of users engaging with local safety-related content [45, 61, 73]. There were 55 individuals who completed the initial screening survey, and 16 of these individuals completed the interviews. We compensated all participants with a \$40 electronic gift card.

On average, participants had lived or worked in EAV for 6 years and the majority were living with friends or family. 63% of our participants identified as female, 25% identified as male, and 13% identified as non-binary. Although we oversampled females relative to the general population, the criminology literature has consistently established that women are significantly more likely to experience both fear and dysfunctional fear, which likely explains our sample demographics [26, 31, 46, 69]. The majority of our participants were

Table 1: Participant Demographics

Participant ID	Age	Gender	Race	Platforms Used	Household members	Time Spent in EAV
P1	55-64	Female	White	Facebook, NextDoor, Ring	No one	22 years
P2	35-44	Female	Hispanic or Latino/a	Nextdoor	My son, he's 8	8 years
P3	35-44	Female	White	Facebook, Nextdoor	My partner, Blake and two children aged 3 and 10 months	6 years
P4	18-24	Female	White	Facebook	2 roommates	8 months
P5	55-64	Male	White	Nextdoor	No	10 years
P6	35-44	Female/non-binary, depending on who's asking	Asian or/and Pacific Islander	Facebook, Twitter	I live with two friends, who own the house	8 months
P7	35-44	Female	Asian or Pacific Islander	Facebook, Nextdoor	Husband and son	1 year
P8	18-24	Female	White	Facebook	My roommate and older brother	8 months
P9	35-44	Male	Asian or Pacific Islander	Ring and Facebook	Wife and two sons	5 years
P10	35-44	Female	Asian or Pacific Islander	Ring, Citizen, FB, Instagram (ATL scoop), NextDoor	My husband	2 years
P11	35-44	Male	Black	Facebook, Atlantanewsfirst.com, patch.com, Twitter	Son and wife	4 years
P12	25-34	Female	White	Instagram, Nextdoor	Roommates	9 month
P13	18-24	Non-binary	Black	Nextdoor, Atl311, crime reports, SpotCrime	I live with my roommate	whole life
P14	35-44	Male	Black	Facebook, Patch, Twitter, 11Alive	My wife	4 years
P15	18-24	Female	Black	Citizen, Mobile Patrol and SpotCrime	Alone	1.5 years
P16	18-24	Female	Black	Nextdoor, Facebook, Instagram, Whatsapp	My parents	10 years

aged 35-44 and 38% identified as White, 31% as Black, 25% as Asian or Pacific Islander, and 6% as Hispanic or Latino/a (see Table 1).

3.1.3 Data Analysis. We used an inductive approach to identify emerging themes about the influence of design on users' fear of crime [7]. Two members of the research team independently coded each transcript in Delve, a tool for collaborative qualitative coding [10], and wrote memos about patterns they observed while coding. Examples of our codes at this stage included "*resolution of incident*" and "*providing perspective*." All coders met weekly for four weeks to discuss memos and compare codes for each transcript. Difference in codes seeded rich conversations which helped evolve our understanding of the dataset. We iterated our codes based on these conversations, sometimes converging on codes and other times keeping multiple codes for a single quote. The first author then used Delve's hierarchical organization features to group the codes into higher level themes. Members of the research team who has been

involved with coding independently reviewed these groups and met to discuss changes. The themes were then iteratively refined over three team meeting. The final five themes included: Empower users to selectively view crime information, Share specific and actionable information, Provide updates and resolutions, Encourage collective action, Enhance the visibility of good news.

3.2 Survey

To evaluate our interview findings, we deployed a survey with a national pool of individuals that had similar characteristics as our interview participants.

3.2.1 Survey Instrument. To develop the survey instrument, we first distilled each of the five themes from our interview data into representative prototypes. For each of the five themes, the first author reviewed all associated codes and brainstormed one to three

Table 2: Example Survey Questions

Question	Scale
If this feature were incorporated, how do you think it would affect your concerns about crime?	1= Decrease concern a lot 2= Decrease concern a bit 3= No effect 4= Increase concern a bit 5= Increase concern a lot -1= Unsure
If this feature were incorporated, how do you think it would affect your quality of life?	1= Reduce quality of life a lot 2= Reduce quality of life a bit 3= No effect 4= Improve quality of life a bit 5= Improve quality of life a lot -1= Unsure

low-fidelity prototypes that reflected the data. As a group, we then discussed each theme and selected one prototype for each theme that 1) best represented the theme, 2) drew from design ideas that surfaced during interviews, and 3) would help us answer any unanswered questions. We refer to the final set of prototypes used in the survey as “representative prototypes” throughout the rest of the paper (see Figures 2–6).

Our survey presented respondents with these five representative prototypes in a random order, and asked respondents to answer four scaled-response questions and one open-ended question for each prototype. These questions asked participants to speculate about how using the feature might influence their 1) quality of life, 2) behavior, and 3) concerns about crime, consistent with Jackson and Gray [31]. We also included three attention check questions which were randomly distributed throughout the survey. See Table 2 for example survey questions and Appendix B for the full survey instrument.

We piloted our survey and discovered that pilot participants found it challenging to understand core design decisions when they were abstracted from specific applications. We thus asked participants to envision their response to these features in the context of Facebook or Nextdoor. We chose these two applications as they were the most popular amongst our interview participants (see Table 1).

3.2.2 Participants. To recruit participants, we posted a screener survey widely on Nextdoor neighborhood groups and neighborhood Facebook groups, as we were interested in recruiting individuals who could envision the representative prototypes in the context of Facebook and Nextdoor. After running into challenges with falsified data and auto-generated entries (a known challenge in qualitative work post-pandemic [59]), we chose to finish recruiting strictly from private groups on Slack and Facebook. Although this strategy significantly reduced the number of falsified or auto-generated entries, it also introduced sampling bias, which limits the generalizability of our results. We screened individuals who responded to our posts against four inclusion criteria, where participants needed to: live in the USA, be fluent in English, have used

Facebook or Nextdoor to find out about local crime and safety information in the past month, and have reported a dysfunctional fear of crime as defined by Jackson and Gray [31].

From those criteria, we were able to have 64 individuals complete the survey. Using Cohen’s $d = .5$ and $\alpha = .05$, the default values often used by the CHI community, we ran a power test and established that our sample size enabled us to obtain a power of over 90% for each of the t-tests reported below, which is greater than the established recommendation [6]. The majority of our survey respondents were aged 25–34, and we again over-sampled women relative to the general population, but not necessarily relative to the population that has a dysfunctional fear of crime [31] (see Table 3). We ran one-sample t-tests to verify that our sample did indeed have a dysfunctional fear of crime and found that the mean response to the question “How much is your quality of life affected by the precautions you take?” was significantly higher than a response of 1 (“Not at all”) ($mean = 3.7, sd = 1.0, t(63) = 20.6, p < .001, d = 2.31$). And a one-sample t-test found that the mean response to the question “How much is your quality of life affected by your worry about crime?” was also significantly higher than a response of 1 (“Not at all”) ($mean = 3.8, sd = 0.9, t(63) = 24.1, p < .001, d = 2.3$). All participants were compensated with a \$20 electronic gift card.

3.2.3 Data Analysis. There is much debate about the best way to analyze Likert scale data and different scholars have made different decisions [9, 25, 49]. We chose to use t-tests as prior work has established the validity and robustness of using t-tests with Likert scale data and has found that t-tests have nearly equivalent empirical results, yet a slightly lower Type II error rate than their non-parametric counterparts [9, 25, 47]. A low Type II error rate was especially important as we wanted to capture potentially minute differences between functional and dysfunctional fear responses. Furthermore, using t-tests with Likert data is not an uncommon practice in HCI because Likert data, though ordinal, can “reasonably be approximated as an interval scale” with increasing sample sizes [25].

For each scaled-response question, we thus calculated a two-sided, one-sample t-test, asking whether the mean value was significantly different than a response of 3 (“no effect”). The null hypothesis (H_0) was that there was no significant difference between the

Table 3: Summary of Participant Demographics

Gender identity	Man (35.9%), Woman (64.1%), Non-binary (0%)
Age range	18-24 (17.2%), 25-34 (42.2%), 35-44 (15.6%), 45-54 (18.8%), 55+ (6.25%)
Race	Asian or Asian American (17.2%), Black or African American (37.5%), White (42.2%), Other (3.2%)

mean value of the responses and a response of 3 (“no effect”), while the alternative hypothesis (H1) stated that there was a significant difference between the mean value of the responses and a response of 3 (“no effect”). All statistical tests were conducted in SPSS, and we considered results significant if the p-value was less than the significance level of .05 ($\alpha = 5\%$). The Cronbach alpha score was .84, indicating a high level of internal consistency or reliability across survey questions. For the open-ended questions, we conducted inductive analysis, similar to the analysis we conducted for the interview data. The first author coded the open-ended answers for each prototype in Delve [10]. Example codes included *“holistic perspective”* and *“trust in police.”* The research team then independently reviewed the codes and met as a group to refine the codes. We did not further group these codes into overarching themes as there was limited open-ended data for each prototype.

4 RESULTS

In this section, we present five strategies that designers of safety platforms can use to decrease dysfunctional fear and support a more functional fear of crime. For each strategy, we share 1) findings from our interviews, 2) the representative prototype, and 3) results from the survey.

4.1 Empower Users to Selectively View Crime Information

“You have to find a way to protect your peace, you know. Because if you absorb everything that’s out there, you’ll go crazy. You’ll be high anxiety, terrified.” -P2

4.1.1 Interview Findings. Participants shared that because crime information is so pervasive, they are *“constantly bombarded by that fear factor”* (P2) and that as consumers of this information, they would benefit from features that would help them limit and filter information.

P2, P5, P7, P9, and P10 all received information about incidents that were not proximate, but which contributed *“to the overall sense of like impending doom”* (P9). P10 explained that the role of social media was to inform him about nearby incidents because *“if something is major enough, it’s happening 3 miles away, it’s going to be in the news.”* P2, P5, and P9 especially cared about the surrounding blocks or about a *“half a mile”* radius (P2). P2 explained, *“Who cares what happens in East Lake? You know it’s like a different world over there. It’s like they get robbed all the time, you know, but I don’t need to know about their robberies, they’re not gonna come rob us over here.”* Participants preferred to limit posts about incidents that were not proximate because these types of incidents did not present a threat to users’ safety but evoked fear nonetheless.

Similarly, seeing information from a whole week or month was *“overwhelming”* (P5), *“jarring”* (P3), *“less relevant”* (P8) and just *“too much”* (P12). P7 explained that *“it can feel like that ‘never ending*

scroll,’ there’s always so much content and being able to just focus on the immediacy of incidents from today, I think, is just healthier for all of us.” She hypothesized that the reason these platforms share so much untimely information is to *“keep you engaged and keep you scrolling.”* Participants suggested interventions such as *“having today’s stories highlighted”* (P8, and also P16, P11) as well as *“defaulting to show the immediate”* (P3). The idea of *“healthier defaults”* was also shared by P2 and P7 who felt that seeing incidents only from the past 24 hours as a default would be less *“alarming”* (P2). This was not true for everyone, however. For a subset of participants who primarily used purpose-built platforms like Citizen, that are solely dedicated to sharing crime and safety information, it was valuable to see the *“whole week”* (P13) of information as well as news about the whole city or even globally (P14). P11, P13, and P14 preferred to see more information but wanted to instead limit the amount of graphic content (P13, P11) and *“violent”* videos that they encountered online (P11).

Participants observed that their concerns about crime all tied *“back to consumption”* and that they wanted more *“options to pick and choose”* the content they consume (P3). Participants suggested interventions to change how information is organized so that they could more easily focus their attention on incidents that presented the greatest threats to their safety. P8, for example, felt that if posts were formatted so that you only saw *“headline, location”* then it would be easy to get the big picture and you would have to click *“in order to get more context”*. This would allow her to quickly scan, so if she saw *“shots heard’ and it’s like Linwood Park, I’m not that worried about it, that’s not near me and I’m not going to click on that.”* Another participant suggested creating *“a sub page [on the neighborhood Facebook group] that was just about all of this crime and safety stuff”* so then you’d have to actively *“hunt out the bad news”* instead of being bombarded with information (P3, also P1). The ability to separately view safety information would also ensure that relevant safety information is not *“diluted with other messaging”* and information (P10, also P4, P8).

4.1.2 Representative Prototype and Survey Evaluation. Our participants suggested that they would appreciate ways to selectively view crime information. We designed the Filter prototype which allowed users to filter posts by location, timeliness, and content type (see Figure 2).

In response to the question *“If this feature were incorporated, how do you think it would affect your concerns about crime?”* respondents felt that the Filter prototype would significantly decrease their concerns, as evidenced by mean values that were significantly less than 3 (a response of *“No effect”*) measured by a one-sample t-test: ($mean = 2.52, sd = 1.26$) : $t(57) = 2.92, p < .01, d = .38$. Similar to many interview participants, survey respondents explained that they appreciated the ability to limit information so that they could *“manage and avoid unwarranted anxiety that results from learning about crime more than .5 miles away.”* While significant,

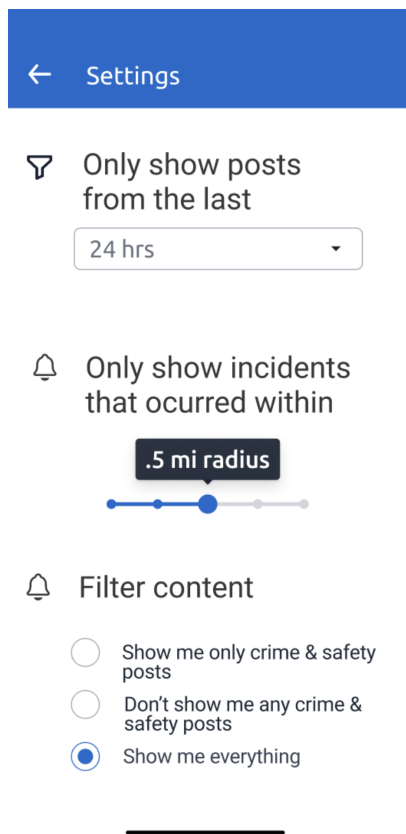


Figure 2: The Filter prototype shows a settings view where users can filter posts by time, distance, and content type.

this effect was not universal. 25% of participants shared that the feature might “stress” them out and could lead to a “certain amount of panic and anxiety” if there were many incidents occurring close by.

For 54% of participants, the Filter prototype supported a more functional fear of crime by motivating behavior changes that increased feelings of safety and quality of life. These participants shared that the addition of this feature may lead them to make changes to their behavior such as “stay home more”, “avoid any areas that have an increase in crime or are notorious for crime”, “change my route,” and “lock the doors and stay indoors” if there was nearby activity. This is consistent with prior work which finds such behaviors supporting a functional fear of crime [39]. A one-sample t-test comparing the average response against a value of 3 (a response of “No effect”) found that respondents anticipated the Filter prototype leading to changes in their feelings or behaviors in a way that would have a significantly positive effect on their quality of life: ($mean = 3.66, sd = 1.23$) : $t(58) = 4.1, p < .001, d = .54$.

4.2 Share Specific, Actionable Information

“What can I learn from wasting my time reading all these posts? Do I really have a takeaway and understand if it was resolved, and what the issue actually was?”-P5

4.2.1 Interview Findings. Posts about safety incidents were often “incredibly vague” (P4), leaving participants unsure of which incidents presented a threat to their safety and what actions they should take to protect themselves. Participants shared examples of posts that described nearby “disturbances” (P4) and “shots heard” as ones that can leave them feeling helpless because they don’t know how to respond. P3 explained that with robberies and burglaries, “you’re gonna change your day to day to keep yourself from being victimized, but ‘shots heard’... nothing I can do.” These types of incident notifications left P3 feeling helpless; “all it does is make me more fearful... if I hear that there’s gunshots every night, all of a sudden I don’t want to go outside at 6pm.” The “paranoia” (P10) intensifies when the incident is “super close to me, but there’s no more detail” (P10) or when the posts are incredibly vague but the “person who’s posting it is using language that implies that we should be really worried about it” (P4). Participants felt that posts were often sensationalized which created a sense of urgency and alarm; P12 found that on Nextdoor “everyone tends to use attention-grabbing titles to make their posts seem urgent or important, even though most of the time they aren’t” and P3 stopped following a safety-related Instagram account because “it is nothing but the ridiculousness and the scary.” P10 explained that safety-related information can leave her feeling disempowered because “without knowing what’s happening, you’re getting alarmed about something that you shouldn’t be stressed about because you don’t know what it is and it’s probably 1) not my business and 2) unlikely to have a dangerous effect on me.” This type of content exacerbated dysfunctional fear by negatively impacting participants’ quality of life without empowering them to take precautionary behavior.

Participants wanted more information so they would know what immediate changes to make to their behavior. Being able to easily find basic information such as “time of day” (P6, and P9), the “actual location” (P5, and P6) and police response (P15) was important. The vast majority of participants wanted to know the incident location so that they would “know where to avoid” (P15, and also P5, P6, P9, P16). Both P13 and P9 had used interactive crime maps that show precise locations of safety-related incidents. P9 shared that a map which “prioritized or ranked lowest threat and more extreme” by color would help him quickly scan, discriminate between violent and nonviolent incidents, and determine when it’s safe to go where. P6 summarized that detailed information is essential to help her determine “whether or not it affects my life and whether or not I need to make changes to my behavior, like if I need to be more careful of when I know packages are arriving, to be home.”

4.2.2 Representative Prototype and Survey Evaluation. Our participants suggested that they would appreciate information that was actionable, rather than vague or sensational. We designed the Map prototype which allows users to view safety incidents on a map. Per P9’s suggestion, we color-coded ongoing threats, violent incidents, and nonviolent incidents to help participants prioritize threats to safety (see Figure 3).

Participants reported that the Map prototype would not significantly decrease their concern about crime. Although the average response rate was less than 3 (a response of “No effect”), a one-sampled t-test did not find it significantly so. 30% of participants shared that the feature would decrease their concern at least a little

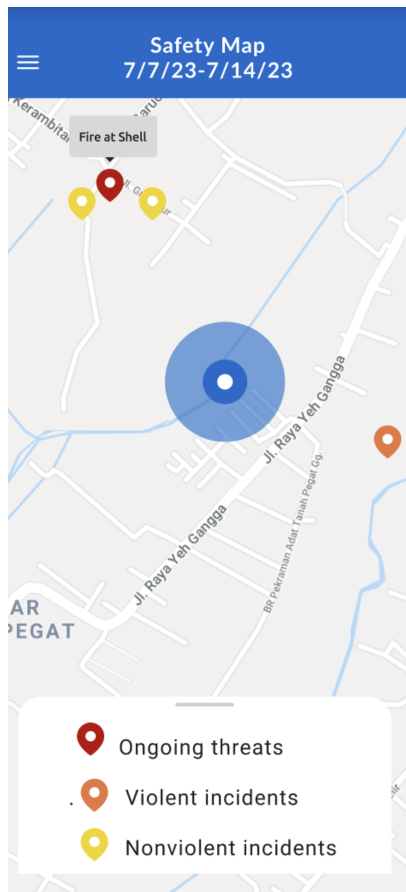


Figure 3: The Map prototype visually organizes incidents and color-codes the incident type.

while 42% said it would increase their fears at least a little. One participant shared their mixed feelings about the feature, *“It would decrease and increase my concern, if it’s an ongoing or violent thread I would be panic or get really worried but if it’s non violent it would decrease my worry...[sic]”*

Still, for 46% of participants, the Map prototype supported a more functional fear of crime by motivating behavior changes that increased feelings of safety. These participants shared that the addition of this feature would help them *“know where to go and where to avoid.”* One participant shared that they would *“feel embowered to navigate my neighborhood more safely and may consider increasing my use of public transportation [sic].”* Respondents explained how even if the feature increased concern, it would still impact their quality of life for the better: one participant shared, *“I want the feature, but probably will affect my mental state negatively. But not so negatively to the point where I don’t want the feature.”* Although participants felt that this feature would have both positive and negative impacts on them, a one-sample

t-test comparing the average response against a value of 3 (a response of “No effect”) found that respondents anticipated this feature having a significantly positive effect on their quality of life: ($mean = 3.4, sd = 1.14$) : $t(61) = 2.8, p < .01, d = 2.4$.

4.3 Provide Updates and Resolution

“Anything that has an actual resolution would make me feel better” (P12).

4.3.1 Interview Findings. Half of the participants we interviewed wanted updates and resolutions on safety incidents. The lack of “follow up” (P8), especially for time sensitive incidents, created “community panic” (P8) while the prevalence of safety posts that were unresolved perpetuated the belief that *“the police aren’t doing anything”* (P13), the *“cops aren’t going to respond in time”* (P7, also P10), and the mayor’s office is *“ineffectual”* (P1).

Participants wanted updates and more information about closed cases; they worried that the perception that there are not enough resources to resolve incidents *“empowers people who are of a criminal element to be bolder and leads to other more dangerous life-threatening crimes”* (P5, P16 also). Participants had signed up for Citizen alerts, SpotCrime alerts, and Amber Alerts and reflected on how *“alarming”* these can be (P2). P2 felt that *“they don’t give you an update, and they should be required to do that because, you know, that’s not fair. It’s like you’re invading my phone with this information”* and then *“you’re just gonna leave people in a state of anxiety and not give them closure?”* Especially for “time-sensitive” situations such as “fires” or an “active shooter”, updates would help keep “community panic down” (P8), provide “peace of mind” (P8), and “quench those fears” (P15). P5 voiced that he gets updates from his power company if the power goes out, but on Nextdoor, even when there’s a shooting or death there is little follow up (also P3). P7 suspected that *“they don’t tell you that [resolution] because they want you to go into the app and use it and get sucked into it.”* When asked about resolution notifications, P8 shared that she often tries to find updates on her own and would appreciate that information being easily accessible. For P4, P5, P6, P8, and P15, updates about life-threatening or time-sensitive incidents can help them understand *“what parts of the neighborhood to avoid and when it’s okay to go to them again”* (P6).

Participants also wanted to see evidence that *“cases are not going unanswered”* (P14), that *“culprits are being caught”* (P11, also P14, P15), and that stolen items are being recovered (P15). Seeing these kinds of stories *“sort of tempers just the incessant reporting of crime”* (P5). P16 shared that it’s not enough to know that the police were called unless he knows that “actions” were taken- *“what did the police do? Did they help in finding the someone who rummaged the car?”* P15 suggested that platforms share monthly updates that demonstrate that the *“police are working towards solving these crimes in this neighborhood.”* Similarly, P10 suggested platforms share *“initiatives being done by the police to reduce”* the most frequent types of incidents in the neighborhood. The effect of seeing these success cases may lead to a downward spiral in crime; if there is widespread perception that the police are *“doing their work”* and recovering those cars then *“those who are committing those crimes will get scared about stealing those cars. So I think it will make me feel a bit safer”* (P16). P5 observed that police *“are on Nextdoor and stuff and do try and pat themselves on the back when they’ve apprehended*

someone, so there is some effort to do that, but it doesn't seem very robust and maybe it just doesn't happen very often."

Participants reported complicated relationships with the Atlanta Police Department (APD), both voicing distrust as well as comfort in police presence. P11, for example, wanted to require police to share updates with "pictures, so it wouldn't look like it's some forgery or some fake message sent from the police department just to close a case that is around in the public." Because of the history of police violence both nationally, but especially in Atlanta, we asked participants about whether community organizations, local government, and local leadership could provide the same kind of reassurance through updates. Participants shared that any type of resolution—whether it's from the police, city council, or local nonprofits had the potential to support their sense of safety. P10, for example, found it "comforting" when her city council representative responded to a local safety incident by reassuring residents that "this is something that we know to be a problem and we're working on it right now," and P5 felt that the awareness that there are nonprofits in the neighborhood makes him feel safer. For the majority of participants, however, only nonprofit organizations which are actually "solving the problem" would make them feel better (P1, also P12). P1 describes a foundation that provided employment opportunities for "waterboys" who used to threaten motorists as an example of an organization that's solving the problem. Along with the majority of other participants, P1 believed that unless a local nonprofit is doing something to change "bad actors" into productive members of society, it wouldn't necessarily make her feel safe.

4.3.2 Representative Prototype and Survey Evaluation. We designed the Official Updates prototype which allows users to view monthly updates from local officials about cases that have been closed at the top of their feed (see Figure 4).

Across all the prototypes, the Official Updates prototype had the strongest impact on participants' concerns about crime. In response to the question "If this feature were incorporated, how do you think it would affect your concerns about crime?," respondents felt that the Official Updates prototype would significantly decrease their concerns, as evidenced by mean values that were significantly less than 3 (a response of "No effect"): ($mean = 2.33, sd = 1.22$) : $t(62) = 4.34, p < .001, d = .55$. Amongst all the features, the mean value was the lowest and the t-value was the highest, indicating the greatest effect (see Figure 7). Participants shared that "knowing that some of these incidents or crimes that happened last month has been solved is a huge relief" and that such information would offer a "strong sense of security."

56% shared that the Official Updates prototype would support a more functional fear of crime. Participants shared that this feature would help them be more aware about incidents that are occurring and avoid dangerous areas. Respondents also shared that this feature may influence the behavior of "culprits" who may be disincentivized to continue criminal activity. At the same time, respondents warned that they don't have "trust" in law enforcement and may further lose faith in local officials' abilities if crime did not decrease in the long run or that law enforcement took long periods of time to resolve cases. One respondent summarized, "it might make me feel slightly safer if I hear about things the police are doing to catch criminals, but only if crime is actually reduced

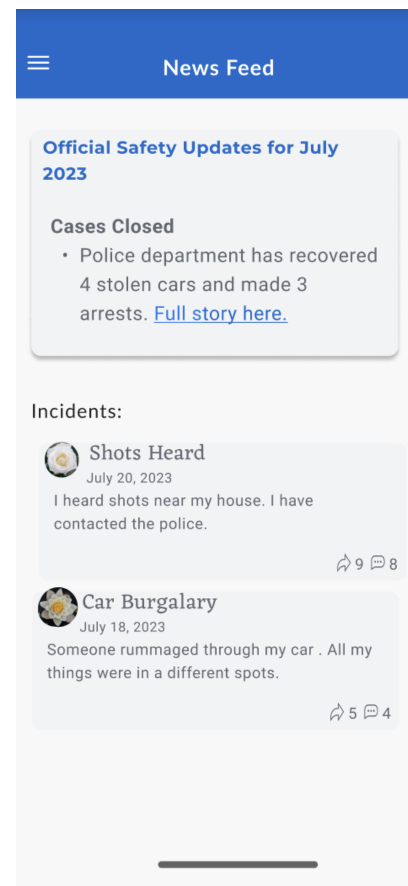


Figure 4: The Official Updates prototype shows a newsfeed with monthly updates about cases that have been closed by the police department.

as a result." These examples demonstrate the value respondents place on feeling not only that incidents are being resolved, but also that crime is actually reducing. A one-sample t-test comparing average response against a value of 3 (a response of "No effect") found that respondents anticipated the Official Updates prototype leading to changes in their feelings or behaviors in a way that would have a significantly positive effect on their quality of life: ($mean = 3.82, sd = 1.09$) : $t(61) = 6.0, p < .001, d = 2.0$. Across all features, the Official Updates prototype had the largest t-value and the highest mean value, indicating that it's highly unlikely that this feature does not improve users' quality of life (see Figure 7).

4.4 Encourage Collective Action

"Someone's always looking out. Someone is always reporting stuff. If anything happens to you and you put it in the Facebook group you could have, like, 15 people be like, "yeah, happened to me too" or like, "yeah, I saw that." It's very much, like, people-have-each-other's-back kind of community" (P8).

4.4.1 Interview Findings. Participants felt safer when they believed that their neighbors were vigilant and looking out for one another.

P2, a native Californian who grew up worrying about gang violence, shared that she knows *“how important it is to know your neighbors and watch out for each other,”* and P5 shared that the *“sense that there are eyes and ears”* in the neighborhood helps him feel safe. On social media, seeing the amount of engagement on safety-related posts in the neighborhood contributed to that sense of safety. For example, regularly seeing crime and safety posts on the neighborhood Facebook page made P8 feel safer because it showed that *“neighbors are being vigilant and want to warn each other. There’s like a sense of community... of warning others and kind of being that alarm call to the rest of the neighborhood to watch out.”* Furthermore, the fact that every post has *“hundreds of comments”* shows that *“people are really invested”* (P8). P15 who gets alerts from SpotCrime and Citizen shared that when she gets alerts, it makes her *“feel like my neighbors got my back”* because the fact that *“someone posts it, it means they’re trying to keep others safe as well.”*

Participants reacted strongly when asked how they would feel about replacing individual posts with aggregate graphs and statistics. While graphs and statistics were helpful, they were not a replacement for the pictures, videos, and commentary that accompany individual posts (P7, P13). There are *“notorious criminals like Jumper Cable Jerry”* (P2) and by posting pictures and videos, you know to *“keep an eye out”* (P2) and *“be on alert”* (P10). P1 shared that when there was a man who *“brutalized his dog”*, a neighbor captured it on his Ring camera and posted it online. The video was *“reposted and reposted”* and the man was eventually arrested. For low-income communities of color, the ability to alert one another can be a critical form of self-preservation. P1, a longtime resident of East Atlanta Village, shared that historically, the neighborhood *“was vastly African American.. and not that affluent at all. And like we were kind of left on our own as many communities of color who are not of high economic status are.”* P1 explained that because the police weren’t patrolling in the neighborhood, you had to learn to rely on each other and that it’s important to *“tell people to be on the lookout.. so that the community can work together”* (P1).

Prior work, however, has documented how online conversations about crime can reinforce negative stereotypes and contribute to both class and race-based profiling [8, 45, 73]. Participants voiced concerns about sharing photos and videos, including protecting the privacy of the perpetrators and their families (P14, P11, P9) as well as the stereotyping (P9) and *“the very racist comments”* that often accompany such posts (P6). P9, a South Asian man, shared that he has received *“looks driving through Ormewood if someone saw me, like ‘oh a brown guy.’”* Participants believed that by highlighting the complex mental health, substance abuse, and poverty-related challenges that underlie safety incidents, platforms can *“create more empathy”* (P9) and weaken negative stereotypes. P8, for example, shared an incident where an unhoused individual was aggressive at the local McDonald’s and asked her for money. Viewing posts about neighbors stocking a local food closet and providing resources for the unhoused reminded her that *“it’s a more complex problem”* that includes mental health issues and addiction and that *“the one guy who’s harassing us on Saturday night, he’s not representative of the greater population of people who are going and benefiting from these events and these donations.”* P12 and P9 shared similar sentiments, suggesting that design interventions, such as tagging posts as mental-health related (P12) or automatically associating

posts with social organizations (P9) can help viewers of those posts keep perspective so instead of commenting that a girl riding her bicycle *“looks suspicious, should I call the cops?”* people might start *“looking out for her, and maybe more people will care about her”* (P12).

When asked about opportunities for users to connect with community organizations working towards neighborhood safety, P5 shared that it may be a way for neighbors to watch out for each other and *“very quickly change your mindset to like, ‘Okay I’m mad about this and feeling helpless and oh wait! I can maybe help at the Boys Club and help some kids from becoming the guy who stole that package.’”* P9 felt that such an approach is *“something that’s missing from a lot of our social networking,”* and wanted the platform to automatically suggest local organizations that the original poster can contact based on the context and location of the post. These participants, however, were in the minority. For the majority of participants, social service opportunities would not change how they felt about crime, unless they were assured *“that doing this will help in a downtick”* of crime (P12).

4.4.2 Representative Prototype and Survey Evaluation. We were curious whether providing opportunities to take actions that support not just personal, but also collective safety can support a functional fear of crime. We designed the Support Local Organizations prototype which allows users to support local organizations involved in neighborhood safety programming and made clear that such activities contribute to long-term safety (see Figure 5).

Participants reported that the Support Local Organizations prototype would significantly decrease their concern about crime. In response to the question *“If this feature were incorporated, how do you think it would affect your concerns about crime?”* respondents felt that the feature would significantly decrease their concerns, as evidenced by mean values that were significantly less than 3 (a response of “No effect”): ($mean = 2.77, sd = 0.83$) : $t(57) = 2.92, p < .005, d = .38$. Participants shared that it would help them feel safer to know that *“that there’s an organization who are ready and out to safeguard the environments”* and that *“members of the community are going to try to do something”*. While the effect was significant, the majority of participants shared that the Support Local Organizations prototype would not lead to changes in their concern unless they saw an impact on the crime rate. One respondent summarized: *“It wouldn’t change my feelings unless I was seeing actual results from the program”*. These examples demonstrate the value respondents place on feeling that crime is actually reducing. Participants acknowledged that there might be long-term effects saying, *“I don’t think it would have any immediate affect on the quality of my life, but maybe in time I might see some positive changes happening in my area from the new feature [sic].”* While theory suggests that getting involved with local organizations may reduce crime in the long run [64, 66], our participants preferred information that more directly support safety in the short-term.

For 20% of participants, the Support Local Organization would lead to a more functional fear of crime. Participants shared that the feature might *“galvanize communities”* and encourage them to *“donate”*. One respondent shared that they would appreciate a *“call to action to do something about crime rather than bunker up”* and another shared that they would like the opportunity to meet others and *“gather intel.”* A one-sample t-test comparing the average

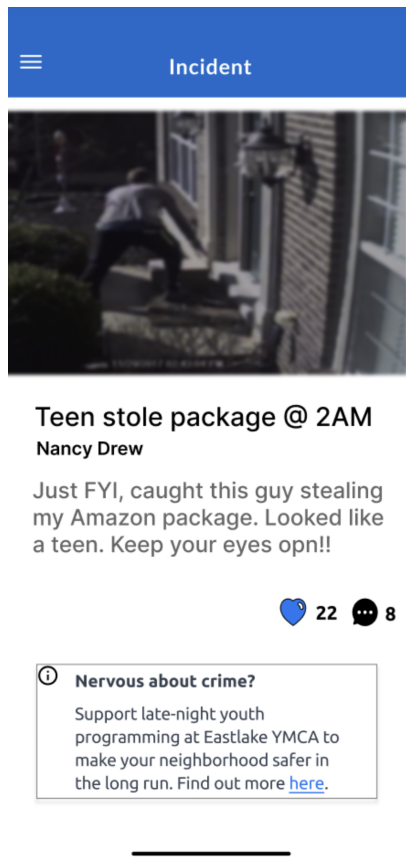


Figure 5: The Support Local Organizations prototype shows a post that provides users with opportunities to support community organizations involved in neighborhood safety.

response against a value of 3 (a response of “No effect”) found that respondents anticipated this feature having a significantly positive effect on their quality of life: ($mean = 3.31, sd = 0.74$) : $t(61) = 3.3, p < .01, d = 1.4$. However, across all the prototypes, the Support Local Organization prototype led to the smallest increase in quality of life (see Figure 7).

4.5 Enhance the Visibility of Positive News

“Feed me the positive. Feed me the stuff that will get me out of the house” -P3

4.5.1 Interview Findings. Almost all participants shared the importance of seeing “good news” in order to get a “more thorough picture” of the neighborhood (P1). P9 felt that “the biggest thing” he’d like to see is “counterbalancing negatives with positives and making sure we’re not just being bombarded with negative messaging.” Participants hypothesized that the reason the crime information gets more attention is because of people’s “morbid curiosity” (P12), the “entertainment” value (P12), and the fact that social media algorithms prioritize posts with more engagement which “have a tendency to be the negatives” (P9). P7 felt that if platforms focused more on good

news, then “it wouldn’t feel like we’re living in this crime-ridden neighborhood or society” (also P1 and P9). Examples of good news included “wholesome” things “happening in the community” (P9), such as “community meet ups, celebrations being done” (P16), “the farmers market” (P9) and “clean up events” (P9). P9 explained that after seeing so many carjackings and thefts, “honestly, I think even neutral helps to counterbalance the negative.”

Participants shared that seeing stories about “good Samaritans” and “local heroes” positively influenced their perception of their neighbors. For example, P5 shared that seeing a post about neighbors volunteering or fundraising “makes you feel safer generally that your neighbor might not be a criminal or an enemy, but might be a friend of a resource. It’s pretty significant I’d say.” Many participants shared that consuming so much crime information contributed to a sense of “stranger danger” (P4, and also P6, P12, P15), particularly towards the local homeless population (P1, P4, P8, P9), but that seeing positive news about their neighbors reminds them that “people are actually doing good” (P7, and also P3, P16) and that “there’s very much a positive force too” (P8). Positive news can also create an upward spiral of positivity, and P12 described that seeing neighbors proactively improving the community can serve as “positive reinforcement in a way, where it’s like if you see change happening, it makes you feel like you can do more.”

Participants shared ideas to enhance the visibility and encourage the consumption of positive news. Ideas included having regular online competitions for “best good news story of the day” (P5), creating rules on the neighborhood Facebook group to limit the number of crime stories posted by any one individual (P3), and organizing the feed to see “the positive stories first, and then the negative stories later on” (P13). P5 suggested that you want to first prioritize “active crimes”, but “otherwise just the general default protocol for sharing information could start with the good news stuff and the community stuff and then have to click a few more times to get the crime reports.” These design ideas, however, may not necessarily apply to purpose-built social media. Participants like P10, P13, and P15 who use purpose-built social media platforms that are strictly dedicated to crime and safety did not want to be “interrupted” by good news, which is not “relevant” (P13). P10 explained that “if I get an app for safety reasons, I’m using it for that specific reason. I’ll get my positive news elsewhere.” These distinctions point to the need for different design interventions for social media and purpose-built social media.

4.5.2 Representative Prototype and Survey Evaluation. Based on interview data, we designed the Good News prototype which displays good news stories at the top of the feed before any crime or safety incidents (see Figure 6).

In response to the question “If this feature were incorporated, how do you think it would affect your concerns about crime?” respondents felt that the Good News prototype would significantly decrease their concerns, as evidenced by mean values that were significantly less than 3 (a response of “No effect”) measured by a one-sample t-test: ($mean = 2.52, sd = 1.000$) : $t(62) = 3.79, p < .001, d = .48$. After the Official Updates prototype, the Good News prototype had the highest t-value indicating that it’s highly unlikely that this feature does not decrease users’ concerns about crime (see Figure 7). Respondents explained that the feature afforded them a

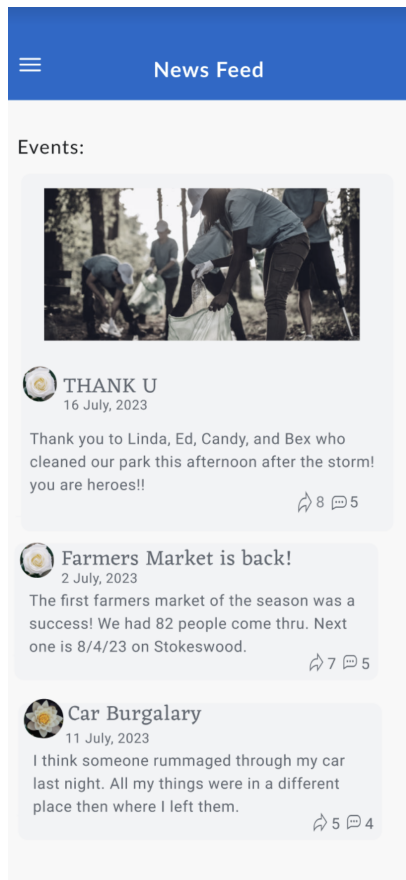


Figure 6: The Good News prototype displays a newsfeed that prioritizes good news at the top of the feed.

holistic picture of the neighborhood and hypothesized that such a feature would “reduce anxiety,” help with their “mental state,” and create a “positive emotional experience.” One participant summarized, “It would put a positive spin on things occurring around my neighborhood rather than a constant spree of crime and the resulting fears.” At the same time, respondents were concerned that by focusing on good news they might miss critical safety-related information or that the good news would not diffuse their worries. One participant explained, “I feel like I would be putting on blinders....” This indicates a need to combine good news with features like emergency alerts which would reassure users that the platform will alert about critical, time-sensitive information when necessary.

For 31% of participants, the Good News prototype did support a more functional fear of crime by motivating behavior changes that increased feelings of safety and quality of life. These participants shared that the addition of this feature may lead them to be more aware of nearby events; “bring community members together as they can talk about going to the farmers market and just connecting with other people positively”, and shift how they move around in their environment. One respondent shared, “Would help in feeling a bit secure with all the positive news and may try to go to places which was avoided in the past out of fear ! Will reduce the level of

anxiety [sic].” Overall, a one-sample t-test comparing the average response against a value of 3 (a response of “No effect”) found that respondents anticipated this feature having a significantly positive effect on their quality of life: ($mean = 3.65, sd = 0.97$) : $t(62) = 5.3, p < .001, d = 1.4$).

5 DISCUSSION

In this study, we recruited individuals with a dysfunctional fear of crime to investigate the types of features that would make their fear of crime more functional. Consistent with the Disorder, Indirect Victimization, and Social Integration Theories, we find that users’ perceptions of their environments, their victimization risk, and the efficacy of their social networks influence their fear of crime. By triangulating theory and empirical data from our participants, we were able to identify five design strategies that have the potential to shift users’ perceptions about risk and support them in developing a more functional fear of crime.

In this section, we present design and theoretical implications of this work, highlighting key principles for designers of safety platforms as well as identifying areas of future work for researchers.

5.1 Support an Accurate and Contextualized Understanding of Risk

We find that the design of existing community safety platforms can distort users’ perceptions of the world around them by “bombarding” them with a high volume of inactionable, sensationalized, and inconclusive safety-related information, which contributes to a dysfunctional fear of crime. Existing platforms indiscriminately raise awareness of safety-related incidents despite the emotional costs that accompany such awareness [8]. Rather than prioritizing awareness, designers of community safety platforms can support a functional fear of crime by accurately representing an environment and contextualizing risk within that environment. The results of this study indicate that designers, for example, do not need to expose users to incidents that are further than one mile away or older than 24 hours. Such “healthy defaults” can prevent users from conflating present, local risks with risks in surrounding areas or risks that presented a threat in the past. Second, sharing positive information supports an understanding of risk that is contextualized within a larger information landscape. Singular representations of place that are governed entirely by crime frame victimization as routine. By providing a diversity of information- about local events, good Samaritans, volunteering efforts, and even neutral news- designers can help users maintain perspective and better calibrate their risk of victimization. Finally, we found that the majority of participants would appreciate updates and resolutions that could give them a sense of “closure.” Viewing incidents without resolutions creates the perception that “nobody is doing anything.” By sharing updates and resolutions, designers can support users in developing a more nuanced understanding of the actions that local officials are taking to support their safety. Collectively, these examples demonstrate that supporting a functional fear of crime means supporting users in developing an accurate and contextualized understanding of risk; it means turning the magic dial so that it is appropriately “tuned into the world” [67, 71, p.186]. By enabling this tuning, designers

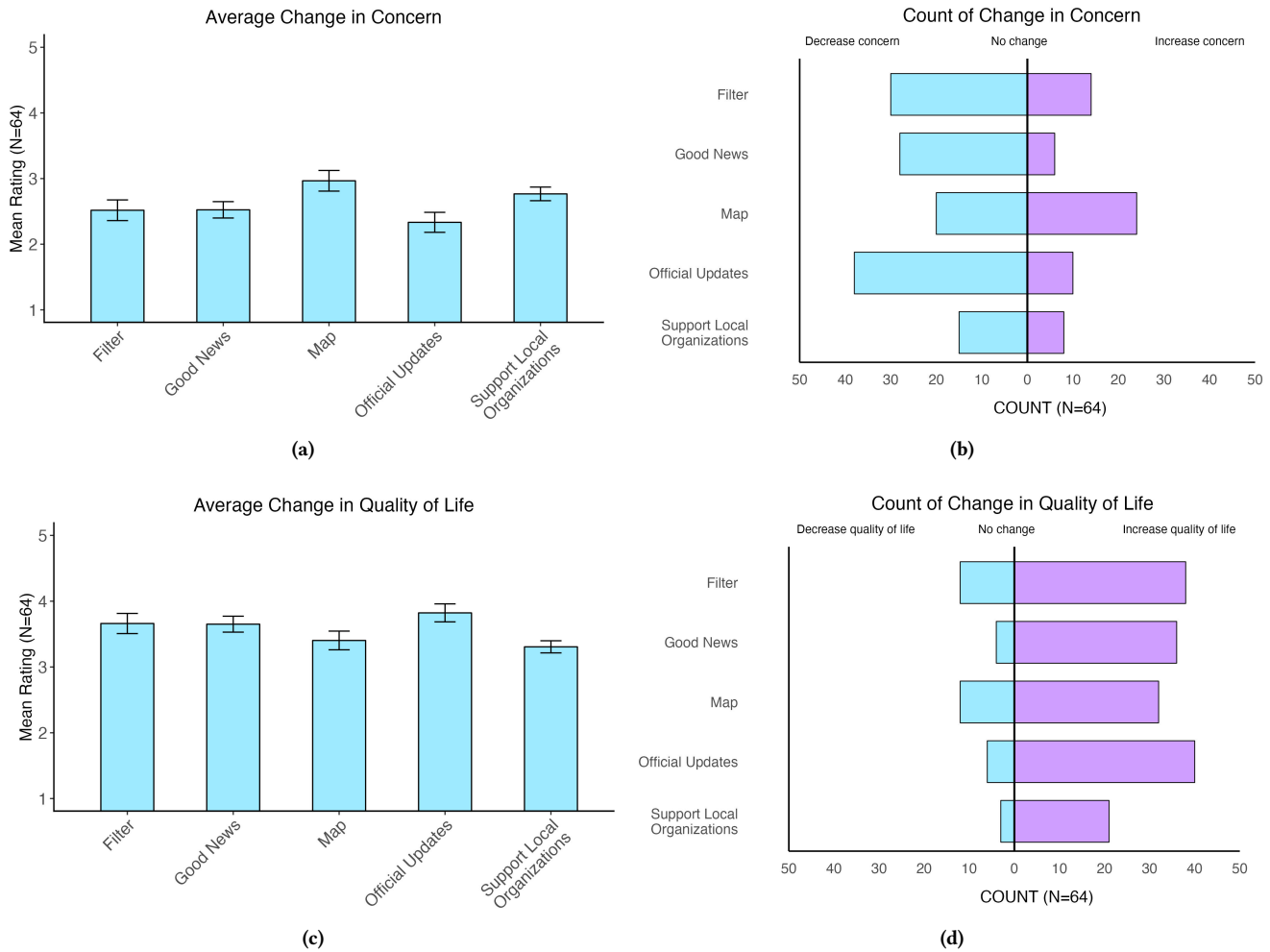


Figure 7: (a) Average participant ratings to the question “If this feature were incorporated, how do you think it would affect your concerns about crime?” for each of the five features with standard error bars; (b) Count of participant ratings to the question “If this feature were incorporated, how do you think it would affect your concerns about crime?” in a diverging bar graph; (c) Average participant ratings to the question “If this feature were incorporated, how do you think it would affect your quality of life?” for each of the five features with standard error bars; (d) Count of participant ratings to the question “If this feature were incorporated, how do you think it would affect your quality of life?” in a diverging bar graph.

can encourage behavioral responses that foster both safety and quality of life.

5.2 Design for De-Responsibilization

Since the 1990s, neoliberal governments around the world implemented a practice of “responsibilization” whereby government entities increasingly transferred the responsibility of managing risk onto individuals [22]. Pyysiäinen and colleagues described it as a form of participatory governance which sought to shift explanation of problems and the responsibility for addressing those problems from external agents to the self [57]. “Active citizens” were encouraged to set up preventative measures, such as neighborhood watch programs and an emphasis on personal responsibility led to the proliferation on personal safety devices- cameras, smart doorbells,

bolts, removable car stereos, and CCTVs [31]. The digital age has heralded a new ability to receive personalized, hyper-local information about safety risks for individuals to further monitor and manage.

We observed that while participants were enthusiastic about the Map and the Filter prototypes, such features also had the potential to increase concern by creating an additional burden to act on the heightened awareness that these features afforded. Participants consistently shared that they appreciated the control, but that the exposure to increasingly accessible, local, and timely information created pressure to consume information and change behaviors accordingly in order to manage their safety. Our results demonstrate the need for designs that support “de-responsibilization,” whereby

individuals shift responsibility for managing risk onto local leadership. Across all the features, participants were most enthusiastic about updates from local authorities. This points to opportunities for community safety platforms to increase the visibility of work done by police, mental health professionals, street outreach workers, city council representatives, and other local leaders to support a functional fear of crime.

5.3 Account for Hidden Community Costs

While functional fear can motivate precautionary behavior, that behavior can also have what Jackson and Gray refer to as “hidden community costs” [31]. For example, participants shared that communication with other neighbors can increase their awareness and support sense-making [56] in ways that improve safety and quality of life. At the same time, both our results and prior work document how such communication can also reinforce class and race-based stereotypes [8, 73], contribute to profiling [45], and lead to increased collaboration with the police which can have disproportionately negative consequences for people of color [50]. Prior work suggests that avoidance behaviors, such as those supported by the Map prototype, can reduce informal social monitoring in areas perceived to be dangerous, which can actually result in increased crime and increased fear of crime [12]. While participants shared that the Map prototype helped them feel safer and improved their quality of life by informing them about which areas to avoid and when, there is a cost to the broader community that can actually lead to increased crime in the long run. Other precautionary behaviors, such as moving into gated communities, may lead to social divisions and segregation [31], and much work has documented how the proliferation of smart doorbells and private safety cameras has expanded the surveillance state [4].

We only recruited individuals with a dysfunctional fear of crime who preferred immediately actionable information and clear evidence that their safety was improving. There was much less support for longer-term interventions, such as investing in local non-profits or community organizations, despite evidence that such investments lead to a long-term decreases in the crime rate [66]. Without taking into account community costs, there is a potential that improving functional fear for individuals might actually decrease community safety in the long run. These examples also point to the need for theorizing a functional fear of crime that is defined not just by improvements to individual quality of life, but also by increased quality of life for the larger community within which an individual resides. Furthermore, prior work has documented that costs to the community are not uniform and are rather disproportionately inflicted on low-income communities of color [8]. We see opportunities for future work to build on such research and continue identifying and accounting for these costs. Sociologist Rahim Kurwa warns that such work is especially challenging because of de-racialized “narratives of safety that nevertheless have racist implementation and results” [37, pg.114].

5.4 The Need for Theoretical Integration

The Disorder, Indirect Victimization, and Social Integration Theories assert that users’ fear of crime is mediated by their perceptions

of their social and physical environments. We find that these perceptions, however, are also mediated through digital technologies where they interact in ways that are currently unaccounted for by criminology literature.

We observed that individual features can simultaneously influence users’ perceptions in conflicting ways. For example, viewing information only about the most local incidents limits awareness of less relevant incidents and decreases the fear of crime as predicted by the Disorder Theory. At the same time, restricting information to only the most local news also increases fear of crime by increasing awareness of highly proximate threats, as predicted by the Indirect Victimization Theory. Providing descriptions, graphics, and context to individual posts makes it easier to discuss incidents with neighbors, decreasing fear of crime as per the Social Integration Theory, but it can increase the salience of each incident, increasing fear of crime as predicted by the Indirect Victimization Theory. We also observed that enhancing the visibility of good news decreases the perception that the environment is rife with disorder, but it can simultaneously heighten concern that users are not adequately aware of victimization risk.

Digital technologies are *simultaneously* influencing users’ perceptions of their environment, their risk for victimization, and the efficacy of their social networks in complex and interwoven ways. Such entanglements are currently under-theorized, limiting the ability of these theories to effectively guide designers of digital technologies. HCI scholars Lewis and Lewis have proposed modifications to crime prevention theories so that they better account for information seeking practices online [42]. HCI scholars can take a similar approach to theorizing interactions between the Disorder, Indirect Victimization, and Social Integration Theories to more effectively guide designers of digital technologies.

5.5 Limitations

There are a few limitations of this study. First, both our interview as well as our survey questions required participants to speculate about how the representative prototypes may influence their concerns, behavior, and quality of life. While triangulating data collection allowed us to gain confidence in participants’ responses, long term behavioral interventions can deepen our understanding of the influence of these features.

Second, our interview participants were largely female, and the experience of individuals who identify as male or non-binary are not as well represented in our findings. This limits our ability to generalize our findings to a population that does not identify as female. Nonetheless, this is mitigated somewhat by criminology research that finds that both fear of crime and dysfunctional fear of crime are more prevalent for individuals identifying as female, suggesting that our imbalance may be aligned with the underlying distribution of the population [26, 31, 46, 69].

Finally, challenges with survey recruitment led us to use convenience sampling and biased our sample towards individuals with whom we have a shared membership in an online, private group. Likely, this skewed our sample towards urban, tech-savvy, and higher-educated Americans. While this does not affect the internal validity of the findings, it does limit our ability to generalize to a broader American population [1]. We see an opportunity for future

work to build on these results with a larger and more diverse sample across the United States.

6 CONCLUSION

Our goal in this paper was to investigate the potential for design to support users of community safety platforms in developing a functional fear of crime, which motivates precaution without negatively impacting quality of life. We conducted a mixed methods study, first interviewing residents of an Atlanta neighborhood and then validating those results by surveying a larger pool of individuals with a dysfunctional fear of crime. Consistent with the Disorder, Indirect Victimization, and Social Integration theories, we find that users' perceptions of their social and physical environments influence their fear of crime and that those perceptions are mediated by digital technologies.

We contribute five concrete design strategies to support users in developing a functional fear of crime: Empower users to selectively view crime information, Share specific and actionable information, Provide updates and resolutions, and Encourage collective action, Enhance the visibility of good news. We discuss theoretical and design implications of this work, highlighting the importance of prioritizing an accurate and contextualized understanding of risk for users of safety platforms as well as designing for de-responsibilization. We see the need for future work to evaluate our empirical findings through long-term behavioral interventions, further theorize the constructs of dysfunctional and functional fear to account for costs to the community, and account for the ways that criminology theories entangle in an online space.

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A INTERVIEW PROTOCOL

A.1 Introduction:

Hi, my name is Ishita Chordia. I am part of a team from the University of Washington trying to understand people's experiences with crime and safety technologies. We are especially curious about how these platforms impact your sense of safety. We're here to hear any opinions you may have, there are no right or wrong answers.¹

A.2 Reflection Questions About Current Usage of Safety Platforms:

- (1) How long have you lived in EAV?
- (2) What concerns you about crime and safety in the area?
- (3) How does that impact where you go in the Village or the kinds of activities you participate in?
- (4) What apps or websites do you use to stay informed?
- (5) Do you think these platforms influence your concerns about crime? If so, how?
- (6) Is there one that creates more stress or concern for you? Why?
- (7) Is there one that makes you feel safer? Why?

- (8) Do you have any ideas about things that you'd want to change in order to feel safer?

A.3 Feedback on the Design of Existing Safety Platforms:

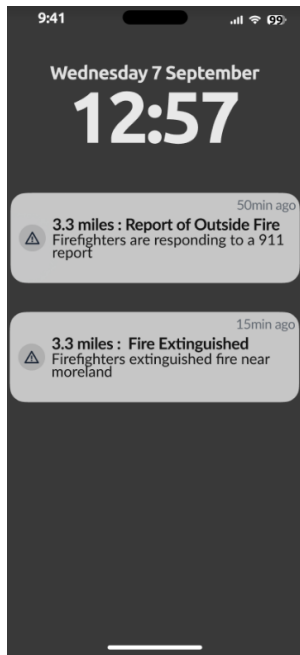
Share modified images from existing safety applications. For each image, explain the picture and let participants ask clarifying questions (see Figure 8).

- (1) What are your reactions to this idea?
- (2) How does it impact your sense of safety? Why?
- (3) Is there anything you'd want to change?

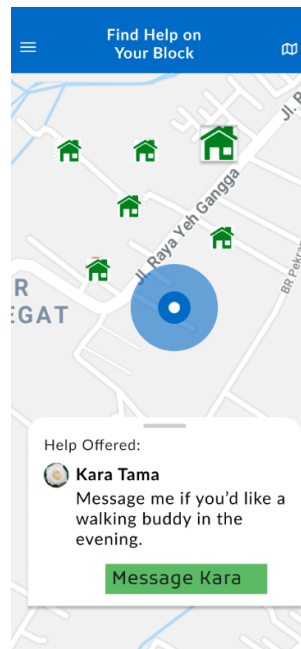
A.4 Closing Questions:

- (1) You've looked at all of these different images, are there any that stood out to you that you think would help you feel safer?
- (2) Is there anything else that you think would be helpful for us to know?
- (3) Do you know anyone else who might be interested in sharing their opinions with us?

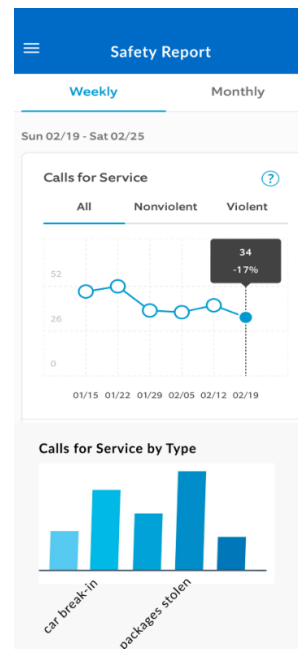
¹Note that the team conducted semi-structured interviews, so this protocol does not encompass all the questions asked.



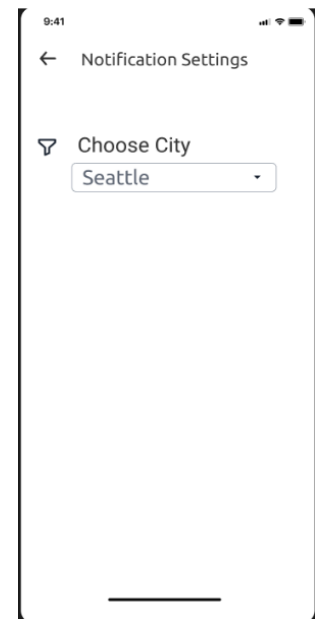
(a) Alerts



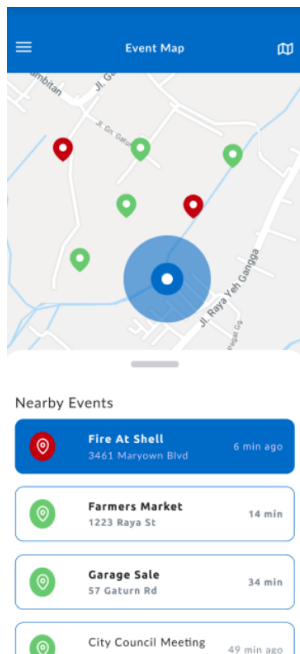
(b) Help Map



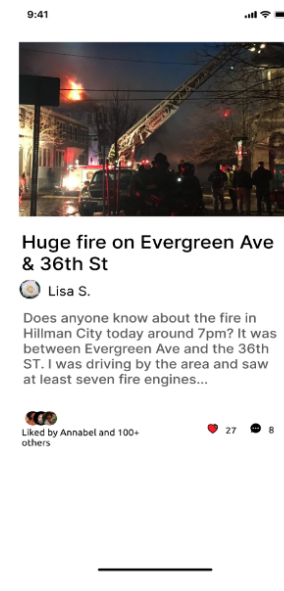
(c) Summary Report



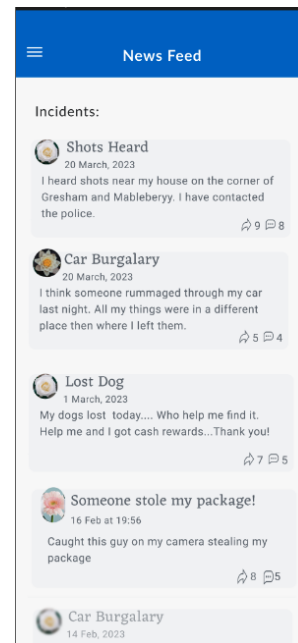
(d) Settings



(e) Incident Map



(f) Incident Post



(g) Newsfeed

Figure 8: These prototypes were used during interviews: (a) alerts about incidents; (b) map view showing offers from neighbors to support one another; (c) a weekly and monthly summary crime report; (d) settings view that allows users to change the city for notification alerts; (e) map view with incidents and events; (f) an incident post; and (g) a news feed

B SURVEY INSTRUMENT

B.1 Questions about Representative Prototypes:

For each of the five representative prototypes (Figures 2-6), we asked the following questions:

- (1) If this feature were incorporated, how do you think it would affect your concerns about crime? ('decrease my concern quite a bit', 'decrease my concern slightly', 'no effect', 'increase my concern slightly', 'increase my concern quite a bit', 'I don't know')
- (2) If this feature were incorporated, how do you think you would change your behavior? ('I would go to places and areas which I currently avoid due to the possibility of crime', 'I would avoid places and areas which I currently visit due to the possibility of crime', 'I would participate in activities which I currently avoid because of crime', 'I would further limit the activities I currently participate in because of crime', 'no change', 'other (open response)')
- (3) To what extent would the changes in your behavior make you feel safe? ('not at all', 'a little', 'moderately', 'quite a bit', 'very much', 'I don't know')
- (4) If this feature were incorporated, it may influence your concerns about crime and your behavior. Overall, if this feature were incorporated, how do you think it would affect your

quality of life? ('reduce my quality of life quite a bit', 'reduce my quality of life slightly', 'no effect', 'increase my quality of life slightly', 'increase my quality of life quite a bit', 'I don't know')

- (5) How, if at all, do you imagine your feelings, behavior, and quality of life would change if this new feature were added to your Facebook or Nextdoor page? Please respond with as much detail as you feel comfortable sharing. (open response)

B.2 Attention Check Questions:

- (1) If you are currently paying attention to this survey, please click on the second choice from the top. ('decrease my concern quite a bit', 'decrease my concern slightly', 'no effect', 'increase my concern slightly', 'increase my concern quite a bit', 'I don't know')
- (2) I am paying attention to this survey and giving responses in good faith ('strongly agree', 'agree', 'no effect', 'disagree', 'strongly disagree', 'I don't know')
- (3) If you are currently paying attention to this survey, please click on the third choice from the top. ('decrease my concern quite a bit', 'decrease my concern slightly', 'no effect', 'increase my concern slightly', 'increase my concern quite a bit', 'I don't know')