

SAFE WALK

Research Summary

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01

Introduction

Problem Statement

Data collected by Gallup indicates that over the past seven years, 36% of U.S. residents have reported that they felt apprehensive when walking alone at night. This percentage increases to roughly 50% amongst women, city dwellers, and the socioeconomically disadvantaged. A significant 18-point gap in perceived safety between the sexes; 45% of the entire female population reports feeling unsafe walking alone at night, as opposed to 27% of men (Gallup 2015). Women tend to be more aware of environmental cues and safety risks, increasing their likelihood to feel unsafe (Bianco & Lawson, 1997). Research has shown that the higher percentage of fear might be restricting the freedoms of women (Pryor et al. 2013).

Despite the fact that design solutions intended to foster safer walking environments for women currently exist, many necessitate cell-phone usage. Attending to a device screen prevents individuals from being mindful of their surroundings, which may increase the susceptibility of becoming a crime victim (USA Today, 2012). Despite the advancements in the field, there are still design opportunities to explore in this space. We are also cognizant of the fact that potential design solutions may introduce the issue of neighborhood

stigmatization. Areas with high crime may also be impoverished areas comprised of members of historically marginalized communities. We intend to approach our project through a value sensitive design lens. We want to empower city-dwelling women while mitigating neighborhood stigmatization to the greatest extent possible.

45% of the entire female population reports feeling unsafe walking alone at night

GALLUP 2015

Target Customer

We aim to help female-identifying individuals in urban environments feel and be safer when walking. Residents of cities are more likely to use walking as a regular form of transportation than those in more rural environments (Saelens, 2003), and as described in the Gallup findings above, city dwellers tend to have an increased fear of walking alone, which may correspond with increased risk (Gallup 2015), making them a fitting population to target. For an in depth explanation of why we chose to focus on female-identifying individuals, see the Gendered Exclusion section below.

Research Questions

What factors contribute to feelings of safety?

What behaviors do women engage in to feel safer?

What are the advantages and disadvantages of current solutions in this space?

BACKGROUND



02

Literature Review

Our literature review exposed us to a set of common themes.

Environmental Factors

There are different types of environmental factors that may signal to women that there is heightened risk of walking in a certain area. These can be, what researchers refer to as social incivilities, physical incivilities, and properties of the built environment. Social incivilities are disruptive social behaviors (e.g., public drunkenness, panhandling, begging), whereas physical incivilities refer to disorderly physical surroundings (e.g., litter, graffiti, abandoned buildings) (Loukaitou-Sideris, 2006). Features of the built environment can also contribute to fear by decreasing visibility and/or ability to escape. For example, a dark tunnel may increase perceived threat because one may not be able to see if someone is hiding (due to the low light), but also because the tunnel is bounded in a way that reduces options for escape if a threat were to arise (Loukaitou-Sideris, 2006). Large open spaces, that are usually deserted (e.g., parks and woodlands), are also commonly feared (Koskela, 2000).

In addition to influencing perceived threat, environmental factors may also contribute to the potential for crime. For example, criminals may look for areas with a high number of escape routes. Similarly, specific business types (e.g., liquor stores, abandoned buildings) may attract crime to an area. On the other hand, there are environmental characteristics that may work to deter crime by creating “defensible space.” Defensible spaces are areas that have physical characteristics that enable residents to ensure their own security (Sohn, 2016). For example, windows facing the street, sufficient lighting, and neighborhood watch signs both allow residents to play a part in contributing to the safety in their area, and at the same time signal to criminals that they are more likely to get caught (Loukaitou-Sideris, 2006), thereby reducing the likelihood of crime.

Perceived Fear vs. Actual Fear

Safety can be divided into two categories: objective and subjective safety. Objective safety refers to the occurrence of criminal offenses, such as theft or burglary. Subjective safety refers to the perception of safety (Ruijsbroek et al, 2015). This is important because, regardless of whether an actual threat exists, perception is what directly impacts one’s actions and motivation. If people perceive an area as unsafe, they tend to walk less (Hong & Chen, 2014).

Perceived safety is rooted in fear and anxiety and stems from many factors including social and environmental incivilities, and one's risk perception of personally becoming a victim. Perception of safety in an environment is also strongly related to how well one knows and feels at ease with one's surrounding (Loukaitou-Sideris, 2006) and there is a significant lack of correspondence between citizen's perceptions of crime and official crime statistics. People tend to downplay local levels of crime relative to city-wide or national levels, regardless of awareness (Forde, 1993). When outside a local environment, judgments about safety are made on the basis of preconceived images about a place and its occupants and cues from social behavior and the physical surroundings (Loukaitou-Sideris, 2006).

Gendered Exclusion

While women are less likely to be the victims of street crime than men, they tend to be more afraid of it, which is often referred to as “the fear of crime paradox” (Pryor et al, 2013). However, the nature of women's fear tends to be different from men's fear in both its cause and effect: women are afraid of sexual violence/harassment, in particular, leading them to develop preventative strategies of distancing themselves in both space and time from potential attackers. Additionally, the unique vulnerability and powerlessness that women face in society may largely contribute to their fears: women, both historically and currently, experience oppression, lack of democratic control, and marginalization in their communities, contributing to feelings of helplessness (Koskela, 2000).

Gendered exclusion is the idea that women's exclusion from space is tied to social constructs. Women's mobility is restricted by the perception of certain spaces as masculine, a product of women's historical exclusion from these spaces, and by the harassment and violence they face in some spaces. Importantly, what this suggests is that women's fear is both a result and cause of women's inequality (Koskela, 2000). While not going out after dark or avoiding specific locations appears to be a reaction to physical characteristics of space, we must also look for the social origin of perceived risks in the environment. For example, as evidenced by northern regions that experience dark days and sunlit nights, avoiding the “night time” is not necessarily tied to levels of lighting, but instead the social construct that night time is dangerous and that women do not belong outside at that time (Koskela, 2000).

Women are taught that they should be actively protecting their safety at all times. From an early age, women are inundated with information from the media, parents, and from school instructing them to “keep safe.” The media often seems to blame a victim's behavior for a violent attack, reporting that they were in “the wrong place, at the wrong time”, and as such, they could have avoided their attack (Koskela, 2000). Additionally, women may face “anticipatory shame,” contributing to their fear of sexual attack: in addition to fear of the crime itself, women experience fear of the victim-blaming associated with these crimes (Pryor et al, 2013).

Technological Approaches

We researched a number of technological approaches in the space, from critical design projects placing crime data in the context of social media experience (Garbett et al, 2015), to property crime risk assessment applications (Kadar et al, 2014), to the role of mobile services in increasing women's safety and security in urban environments (Blom et al, 2010). While some approaches using crime data, map visualizations, crowd-sourcing, and risk calculations face some efficacy challenges, they also have potentially negative social consequences. However, potential remains for new interpretations of data and mapping (Rosner et al, 2015), and the public is generally interested in the topic (Garbett, 2015). Additionally there are many commercial products that seek to address keeping people safe when outside. We will survey these different products in a comparative assessment later on.

Research Practices

Our secondary research provided important insights that will inform our research protocol.

When deciding on our research population, we should be mindful of the ways that factors other than gender affect perceptions of safety in tandem with gender. Not all demographics of women tend to experience the same amount of fear. For example, pregnant women, women of color, differently-abled women, and elderly women, tend to have even higher fear levels than women in general. Additionally, certain fears may affect particular populations of women and not others. For example, sidewalks in disrepair may cause additional sources of fear for elderly women or the differently abled (Loukaitou-Sideris, 2006; Koskela, 2000).

One of our papers stressed the importance of qualitative over quantitative research to understand fear. While quantitative research methods provide information about the fear according to demographics, such as the number of women who report fear of a certain area, they do not offer sufficient insight into the psychological process by which fear is produced. Qualitative research methods explore the experiences of participants, through writing or personal interview, which allows the researcher to investigate the reasoning behind the phenomenon of fear, rather than just the data of where and when it occurs (Koskela, 2000).

Lastly, in addition to researching what makes people feel unsafe, we should also research what makes people feel safe, as environments and behaviors that make people feel unsafe are not necessarily the opposite of those that make people feel safe. For example, bounded areas tend to make people feel unsafe, but so do vastly open areas (Koskela, 2000), so it would be wrong to assume that the opposite of bounded areas (open areas) make people feel safer. Relatedly, we should pay attention to what is referred to as "unique invulnerability," in which people view themselves as less likely to be a victim than others, meaning potentially certain people aren't afraid enough (Pryor et al, 2013).

03

Competitive Analysis

In order to better understand the landscape of available solutions, we conducted an investigation of current products, services, and programs designed to promote walking safety. We wanted to discover who our competitors are targeting, what their main features are, and where there are areas for opportunity.

The Implementation

Through our competitive analysis, we explored a number of technological approaches to increase actual and perceived safety. We conducted a survey of roughly thirty existing products, both directly and tangentially related to the issue of walking alone, and categorized the apps into seven distinct groups based on app features. The categories are as follows:

- Risk and incident prevention, for example, preventing active shooter scenarios
- Apps specifically designed to encourage safe walking practices
- Sexual harassment and assault prevention
- Apps that enable users to share their location, or monitor the location of another individual
- Apps that include crowd-sourced elements
- Physical devices
- Apps that utilize crime data

We then proceeded to conduct an in-depth analysis of the apps we deemed most pertinent to our project. This included an examination of product impressions, that is, how companies present themselves, how the media receives them, and how customers review the products (for an exhaustive summary of our top competitors, please refer to the Appendix). In addition to reviewing mobile applications and wearable devices, we also investigated current services including HuskyWalk and NightRide, as well as personal defense strategies like taking self-defense courses and carrying tools like mace.

There are a number of ways in which the current landscape of products are not sufficiently addressing the needs of our target users, but the most

	LiveSafe	Companion	Circle of 6	Hollaback	Revolar	ROBOCOPP	TapShield
<i>Tagline:</i>	<i>Making our world a safer place.</i>	<i>Never walk home alone</i>		<i>You have the power to end harassment</i>		<i>The world's smallest SOS alarm</i>	<i>Information sharing to prevent incidents</i>
CONTENT FEATURES							
Subscription based					x		
One-time payment or free	Free	Free	Free	Free	One time payment	One time payment	
Map	x	x		x	x		x
Shows crime data	x			x			x
Crime alert notifications	x						x
Physical action triggers alert					x	x	x
Anonymity in reporting	anonymity	?		x			x
Connection to Hotline or Counselor		x					x
Campus or workplace Integration	x		x				x
Interaction with outside community	x		x	x			
TECHNICAL FEATURES							
App Requires Location Access	Only when using	Only when using	Only when using	Only when using			Always
Emits noise						x	Automated voice warning
Sends location info	x	x			x		x
Collects reports	x	x	x	x			x
Smart Sensor		x					x

obvious failure across a majority of these products is that they underestimate the difficulty that female-identifying individuals have in reaching out to others for help. Please refer to our Synthesis section of this document for further detail on the following statements, but our research demonstrated two things. First, participants are very sensitive to taking action that may be perceived as an overreaction. Participants seem to be reluctant to contact emergency services in situations in which they do not feel entirely confident that they are in danger. Many apps operate on the conceit that apps should provide a streamlined system for contacting the local authorities, but we believe that features like this are likely to go unused outside of situations

in which a woman is already in danger and unable to protect herself. Our second finding revealed that women have trouble communicating their fear, even to friends and family. Apps that recognize that there need to be “levels of escalation,” so to speak, encourage users to reach out to friends and family in situations in which they feel uneasy. However, we learned that our participants are extremely preoccupied with not wanting to burden or worry others, especially in scenarios in which the perceived threat far outweighed the actual threat. We believe that a product we create should not make the same assumptions about women and their willingness to ask for help that our competitors have made.

04

Heuristic Evaluation

Nielsen and Norman’s “Five E’s of Usability” were used to assess Revolar, a “smart” panic button (please refer to the competitive analysis in the Appendix for a detailed description of the device), a self-defense tool known as a “travel wrench,” and the mobile application, TapShield.

REVOLAR



General Usability

Effective:	High
Efficient:	High
Engaging:	Medium
Error Tolerant:	Low
Easy to Learn:	High

1. The one-touch solution is effective, efficient and easy to learn. The product is minimally engaging, and though it is designed to make false presses harder to do, errors are hard to recover from.
2. Discreetly sized with easy loop and a clip at the back make using the product more engaging and effective.

TRAVEL WRENCH



General Usability

Effective:	Medium
Efficient:	Medium
Engaging:	Low
Error Tolerant:	Medium
Easy to Learn:	Medium

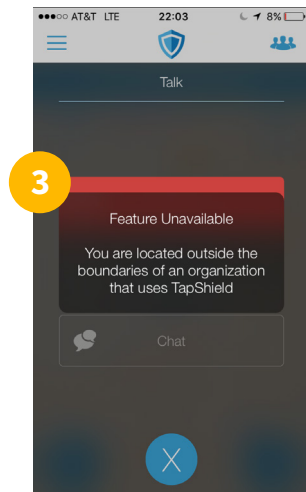
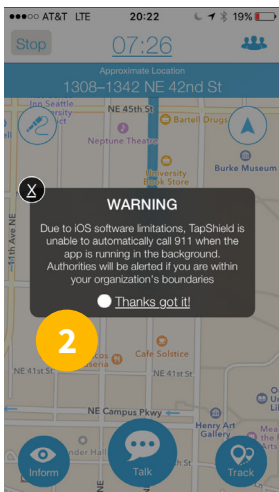
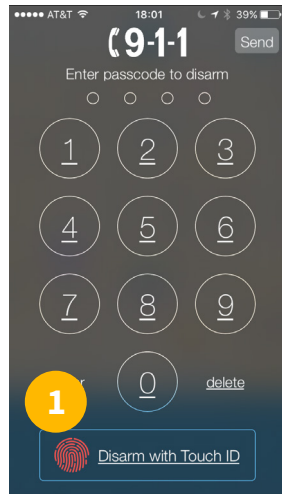
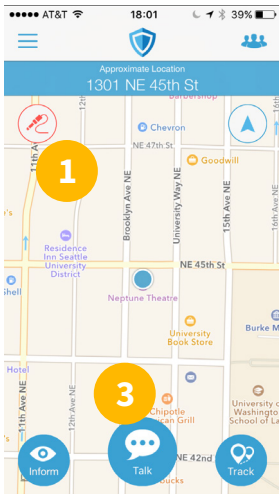
1. This tool is as effective, efficient, and easy to learn if the user is physically capable of striking someone. The tool is also praised for being error tolerant in that it contributes to stable striking and knuckle protection.
2. The tool is not engaging in design, but holding it provides a tangible feeling of protection for the user.

The Five E's of Usability are as follows:

- Effective: How completely and accurately the task is completed, or, the goal is reached
- Efficient: How quickly the task can be completed
- Engaging: How well the product draws the user into the task and how pleasant and satisfying it is to use

- Error Tolerant: How well the product prevents errors and can help the user recover from mistakes that do occur
- Easy to Learn: How well the product supports both the initial orientation and continued learning throughout the complete lifetime of use.

TAP SHIELD



General Usability

Effective:	Medium
Efficient:	Medium
Engaging:	Medium
Error Tolerant:	Low
Easy to Learn:	Low

The app is designed to be more engaging with a map homepage and pleasantly colored icons and features.

1. App is not very error tolerant as evidenced by automatic triggering of 9-1-1 calls via headphones pulled from their jacks, and these errors are hard to recover from.

2. Though popups could provide guidance, they are confusing, and hard to dismiss.

3. Effectiveness and efficiency are compromised by lack of information about the parties contacted through the inform and talk icons and the necessity for a local organization to have set up the app.

05

Popular Media Scan

In our competitive analysis, we began by investigating media resources - news articles, UWPD emergency alerts, and the like - in order to learn more about public opinions regarding existing solutions in the industry. In order to supplement this research, we conducted a more in-depth popular media scan exploring how the local media covers the topic of sexual assault.

A significant number of articles discussed sexual assaults occurring in the University District. The UWPD released a total of 24 crime alerts over the past year, six of which contained references to sexual assault. These six instances are shown below, plotted alongside the amount of the local media coverage of sexual assault. As shown, almost all of these references were published in the aftermath of a sexual assault. Of course, this coverage includes news about the event and its effects, but this is also the period when the majority of preventative and educational articles are published. In other words, there seems to be a trend indicating that whenever an assault occurs, there is a flood of corresponding articles both about the specific incident, but also about preventive safety measures women can take in order to protect themselves.

A sample of some of the articles discussing sexual assaults in the University District

 **Morgan Chesky** @BreakingChesky · May 11
 Three sexual assaults in less than a month have UW students concerned. Now some are using apps to stay safe. VIDEO:



Police investigate report of sex assault in U District alley
 SEATTLE - Police are investigating after a woman reported she was sexually assaulted in the University District. The assault reportedly happened Friday...
 komonews.com



 **KIRO Radio 97.3 FM** @KIRORadio
 Another sexual assault near the UW has neighbors on edge. Listen at 11.

mynorthwest.com/streams/stream...
 10:46 PM - 10 May 2016

Local News

Another sexual assault reported in Seattle's U-District

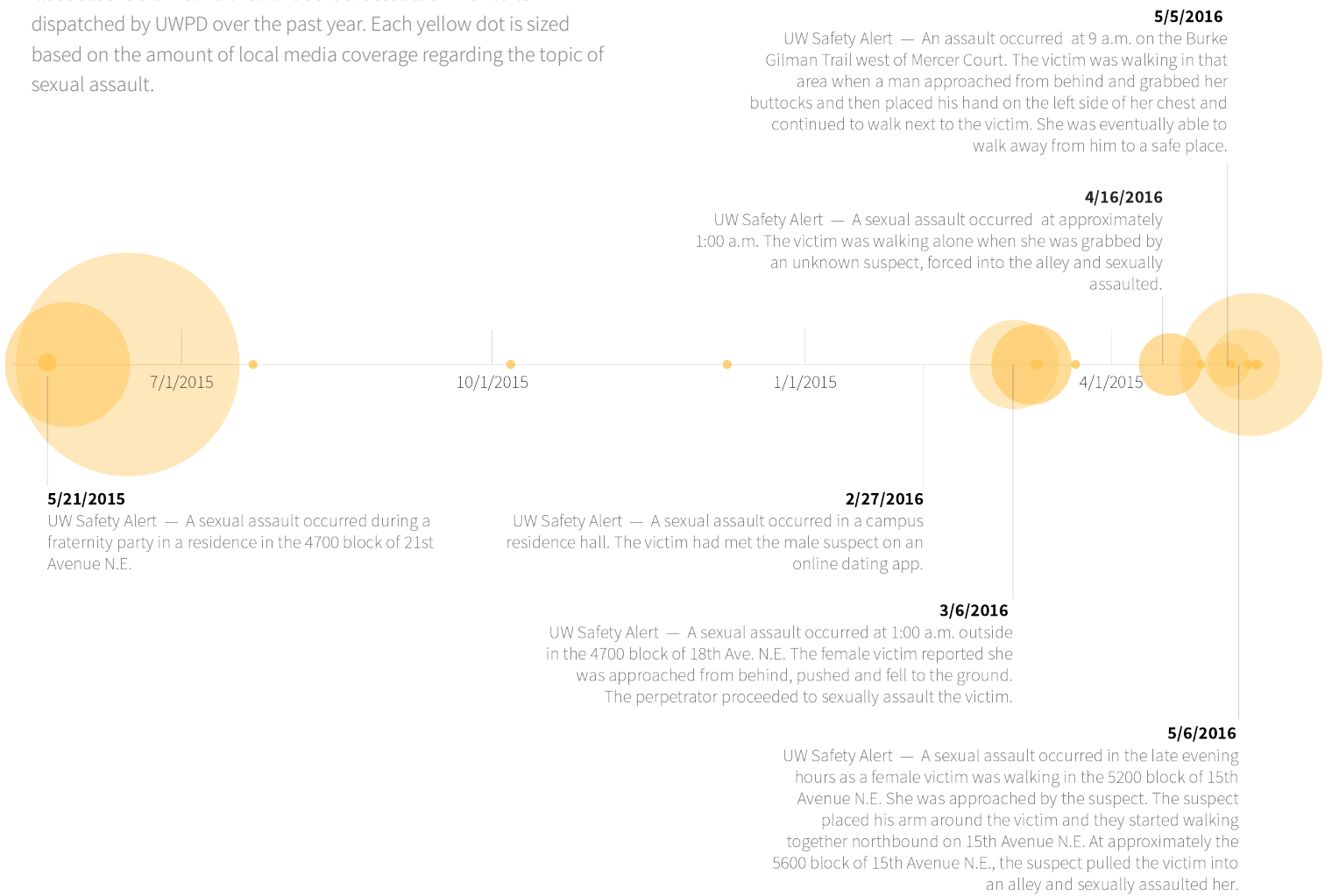
BY DYER OXLEY, MyNorthwest.com Writer | May 10, 2016 @ 3:36 pm



New applications aim to transform and aid reporting of sexual assault
 Dailyuw - May 6, 2016
 The I've-Been-Violated App is designed to allow a victim of sexual assault to confidentially record evidence, such as location and environment, on the app for ...

FIGURE 4-1 : TIMELINE OF SEXUAL ASSAULT ALERTS

Illustrated is a timeline of all the sexual assault Crime Alerts dispatched by UWPD over the past year. Each yellow dot is sized based on the amount of local media coverage regarding the topic of sexual assault.



For example, on May 6, 2016, only a day after the fourth sexual assault that occurred this year, the University of Washington student newspaper, The Daily, published an article entitled “New applications aim to transform and aid reporting of sexual assault”. This article discussed two new mobile applications that focus on the “reporting” phase that takes place in the aftermath of a sexual assault: Callisto and I’ve-Been-Violated by We-Consent. Interestingly enough, despite the fact that both of these apps had been available to download for more than six months, each receiving nationwide press last fall and at the very beginning of this year, local news outlets did not give these tools any coverage until the aftermath of an assault. In the months following the more recent sexual assault alerts, The Daily published three articles discussing preventative information and local media stations such as KOMO News and King 5 also began broadcasting this information. On May 10, 2016, KOMO News aired a news segment describing the series of sexual assaults that have occurred in the U-District. The report shares some of the methods students are currently using to be safe — one being the use of the mobile application, Companion.

This trend illustrates an education cycle that is highly reactive instead of preventative. By the time the media is sharing information about how to be safer in the local environment, it has already become an issue.

06

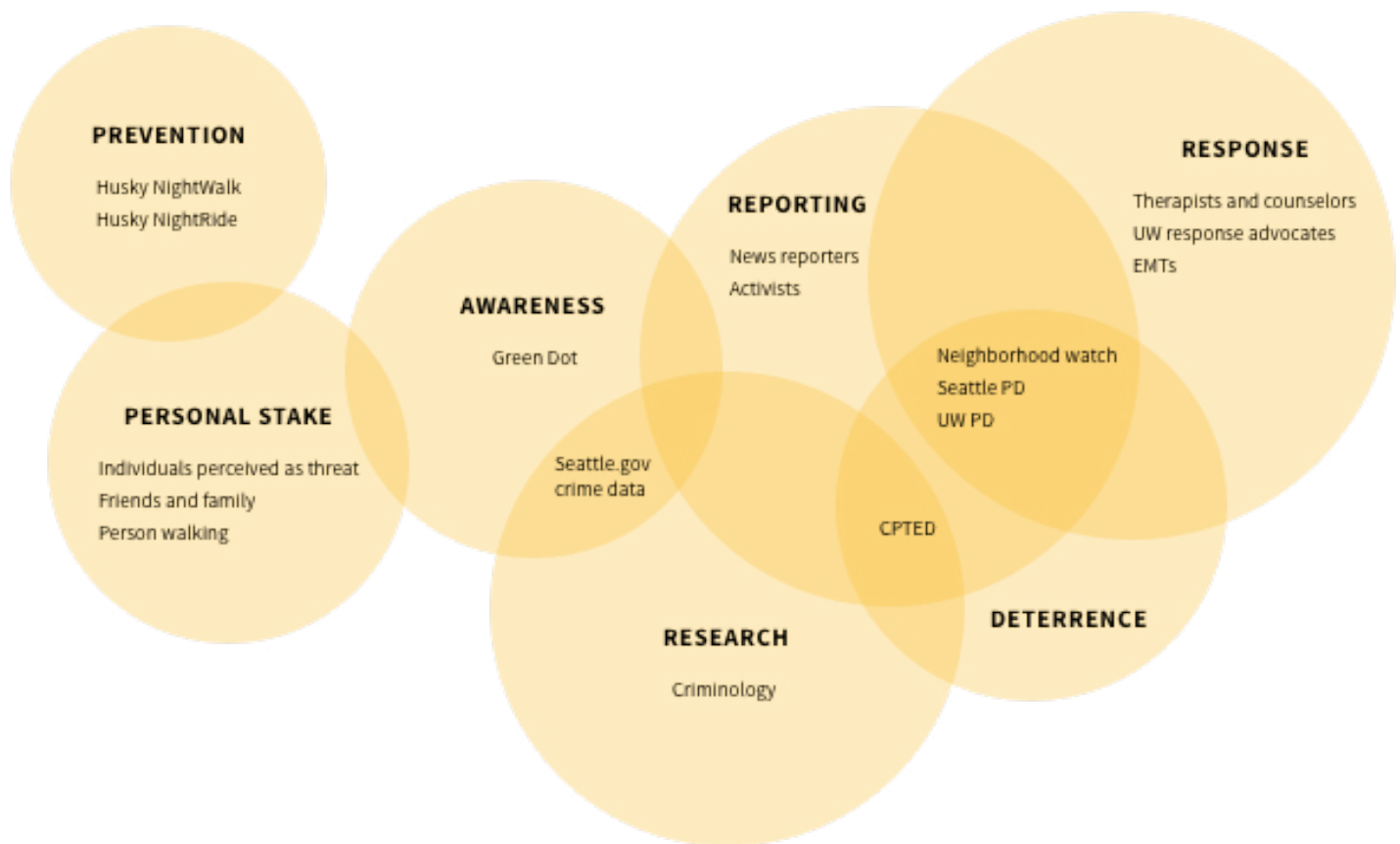
Stakeholder Map

Conducting a stakeholder analysis allowed us to examine and visualize the relevant parties involved in solitary walking and safety and to understand how the needs and values of these stakeholders relate. It is clear from the Stakeholder Map that while all stakeholders share a vested interest in increasing safety in some capacity, safety is a multi-dimensional issue and approaches to improving safety vary as does the timeline of intervention (e.g., preventative vs. response). Furthermore, creation of the Stakeholder Map illuminated the fact that the various approaches to safety are more nuanced than previously thought (e.g., what we thought of as “prevention” can be further broken down into “prevention”, “deterrence”, and “awareness”).

The Implementation

We began by brainstorming who the stakeholders are, that is, identifying the individuals affected by solitary walking and those who influence or are interested in providing solutions to the problem. Stakeholders included both individuals as well as larger entities like organizations and governmental services. We did not include consumer products or apps in the Stakeholder map because this information was largely covered in the Competitive Analysis.

Ultimately, we identified seven main values common across stakeholders and designated where these values and stakeholders overlap using a Venn Diagram.



The seven values include:

Environmental - creating a built environment that deter criminals (e.g., well lit areas may make it more likely an assaulter will get caught)

Systemic - discouraging assault by promoting fear of formal consequence (e.g., knowledge of the judicial system, police regularly patrolling the area)

Individual - warding off assault through personal behavior (e.g., deterring would-be attackers by prominently carrying pepper spray on front of backpack)

Response (to Assault) - acting after an assault has occurred

- Immediate - stopping the crime in the moment, or, responding to the scene of a crime
- Long term - acting beyond the immediacy of assault (e.g., therapy for victim, trial, jail sentence for assaulter)

Research

- Academic - exploring novel approaches to promoting safety from assault
- Governmental - collecting data on assault

Reporting

- News Reporting- reporting to the general public of incidents of assault, punishment for assaulter, and how to keep safe
- Crime Data - providing the public with information and visualization about crime rates
- Protesting - putting pressure on society and the system to change rhetoric and policy

Personal Stake - personal needs and values around safety

- Primary - being concerned with personal well being while walking (e.g., avoiding being assaulted while walking or avoiding being perceived as a threat while walking)
- Secondary - being concerned with another's well being while they are walking alone



RESEARCH

Primary Research

After examining existing literature regarding our problem space, we transitioned into the primary research phase of our project in which we sought to uncover original insights that could shape future design solutions. Our primary research efforts consisted of conducting subject matter expert (SME) interviews, as well as recruiting female-identifying UW students to participate in field research, diary studies, and semi-structured interviews.

Participant Profile

We recruited and conducted primary research with six female-identifying University of Washington students (five participants for the diary study and semi-structured interviews, and one participant for the field study). We plan to conduct field research with a few more participants before concluding this phase of our research. We chose to focus our research specifically on college students because they are likely to walk routinely, and research has shown that female college students may be extremely perceptive and sensitive of the area around them, particularly at night, resulting in increased fear (Pryor et al. 2013). Furthermore, our interview with Natalie Dolci, UWPD Victim Advocate, suggests college students face a unique safety risk because college campuses are a “target rich environment” for people who are intentionally seeking out young women (e.g., people using Tinder presenting as undergraduate age); these individuals know that they will be able to find young women on campus while maintaining anonymity and the ability to come and go without scrutiny, leading to coercive or violent situations. From a data perspective, one final benefit of studying college students is that there is robust literature on perceived fear and walking amongst this population, allowing us to better triangulate our findings.

All participants included in our studies tend to walk alone at night for at least twenty minutes a week. Twenty minutes was implemented as a somewhat arbitrary measure in an effort to recruit students who walk alone at night regularly.

All participants are current residents of Seattle: four out of six participants live in the University District, one participant resides in Queen Anne and one resides in Ravenna, just north of the University District. Of the four participants who live in the University District, three live north of campus and one lives west of campus. By recruiting students who live in different parts of the University District, as well as students who live in neighboring Seattle neighborhoods, we were able to examine experiences from a variety of walking routes.

Additionally, two participants regularly take the bus at night. This was important for our research because waiting for the bus, as well as being in a bounded area (i.e., the bus), tend to correspond with increased risk and fear (Loukaitou-Sideris, 2006).

While our secondary research rightfully cautioned against using a “one-size-fits-all” approach when trying to understand the fears that women face (Koskela, 2000), for the scope of this study, we likely have the most access to UW students. As a consequence of our condensed research timeline, we have limited our research participants to that demographic and will not have a representative sample of any other subpopulations of women. We recognize that we will be limited in our ability to generalize the efficacy of our design solution to other populations, but although we are exclusively studying UW students, we see this as just a starting step. We hope that through our conversations with college students we will uncover insights that will inform a design solution that is suitable for other populations as well.

Recruiting Process

To recruit participants for our studies, we posted a message in the UW Free & For Sale Facebook group, a private group accessible only to those with a UW NetID. This Facebook post included a brief explanation of our study, directing those interested to email us for more information. If, after learning more over email, they were still interested in participating and if they seemed particularly invested in our topic of study (helping female-identifying individuals feel and be safer when walking alone), we then spoke to them over the phone to further evaluate whether they seemed like a good fit for our study. We ultimately included four out of the five participants we called. While self-selecting to participate in a study contributes to bias, we felt it was important to find participants who would be motivated to contribute to this topic because participating in a diary study is a somewhat demanding task and we were concerned with participant retention. In our phone screener, we included questions to assess whether they matched the participant profile described above and to evaluate whether they seemed engaged with the topic and open to discussing their experiences. To view the phone screener we used, view the Appendix. In total, four of the six participants were recruited through Facebook and the remaining two participants were classmates from night classes we were enrolled in. All participants were recruited using the same screener.

Subject Matter Expert Interviews

Expert interviews provided us with the opportunity to gather information from individuals who possess in-depth knowledge of issues affecting women's perceived and actual safety; specifically, what makes women feel unsafe and how they attempt to mitigate these feelings. We wanted to understand why women do or do not utilize current solutions. We were able to elicit subject matter experts' knowledge to uncover different dimensions of the issue and provide our team with the opportunity to solidify our understanding of the problem space in an expedited fashion. We used the insights and data collected from these individuals in order to further examine information uncovered through secondary research.

The Implementation

Our secondary research gave us a strong grounding in the theory of perceived safety. In the next stage of research, we were interested in gaining a better understanding of actual safety in the vicinity of the U-District, as well as the tangible consequences of fear. This insight helped us identify four broad categories of potential subject matter experts: Experience and Environment SMEs, UW Safety Initiative SMEs, Technology Solution SMEs, and Seattle Public Safety and Crime Prevention SMEs.

In order to understand how the construction of urban and digital spaces affects women's perceived and actual safety, we spoke with UW faculty member, **Daniela Rosner**, as well as Seattle Neighborhood Group Senior Program Manager, **Tari Nelson-Zagar**. Our interview with Tari-Nelson Zagar made us realize that our final design solution should be cognizant of the fallibility of anecdotal information and crime data. Avoiding errant information requires designers to frequently check personal biases and maintain good relationships with the user population under study; as designers, we should also take the cultural norms of a community into account before imposing solutions. In addition to this piece of information, we learned that our solution should consider features of the environment that may have different safety and

SUBJECT MATTER EXPERTS



Daniela Rosner
HCDE Faculty



Tari Nelson-Zagar
Seattle Neighborhood Group
Senior Program Manager



Gillian Wickwire
UW SafeCampus
Threat Manager



Natalie Dolci
UWPD Victim Advocate

surveillance concerns. Issues of safety are different in private, semi-private, semi-public, and public zones, especially where these zones overlap.

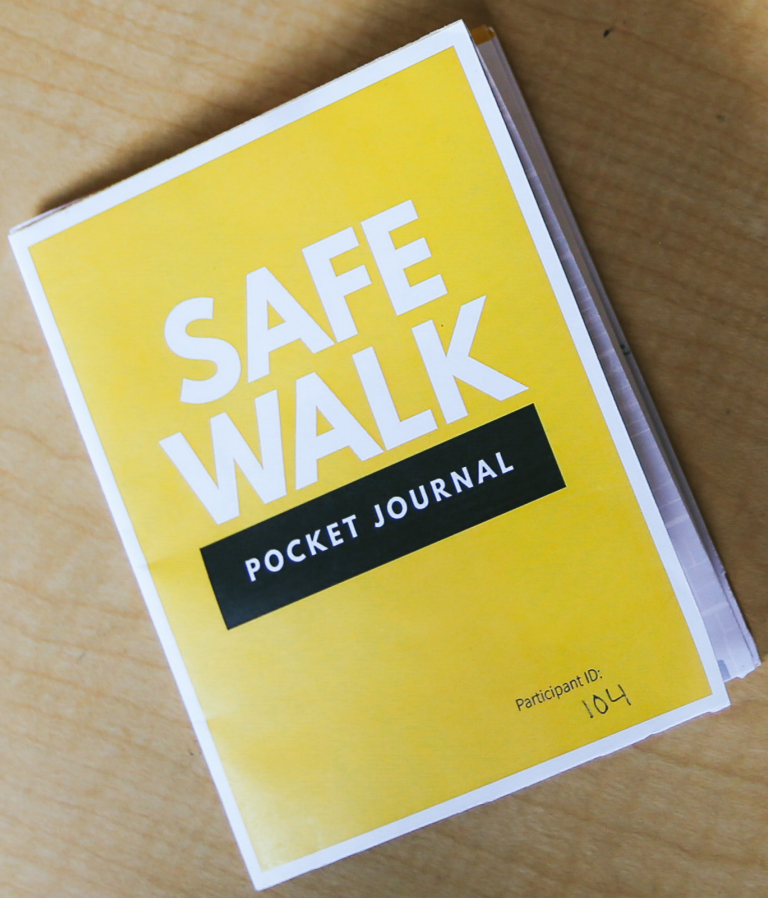
Daniela Rosner made it clear to us that our solution should not contribute to stereotyping and stigmatization of neighborhoods or the people who live there. Additionally, if our solution were to make use of crime data, we could use that data in a way that exposes stigmatization, rather than contributes to it. Daniela also helped us shape our diary study protocol by suggesting that we should have participants take photos during their walk because they won't be able to write during the walk. These photos could then be used during the follow-up interview to help participants relive their experiences with us.

We also met with UW staff members tasked with assessing and preventing violence on campus. These individuals include **Gillian Wickwire**, the UW SafeCampus Violence Prevention Response Program Threat Assessment & Management Specialist, and Natalie Dolci, the UWPD Victim Advocate. **Natalie Dolci** impressed upon us that our solution must be simple, and cannot require much thought or action from a user in a threatening situation; she cited an executive functioning failure as the basis for this suggestion. She also discussed the bystander effect and the idea that if our solution attempts to provide women with alternate, that is, safer, walking paths, then we should consider factors such as open businesses, traffic flow, and possible witnesses. She also talked about the fact that many people are not utilizing existing safety services like Husky NightWalk or mobile applications, but, of the products that are being used, the most impactful solutions are ones that lower the threshold so more people report instances. Gillian Wickwire echoed Natalie's sentiments, stating that our solution would be

significantly better if it was part of a larger system bringing about broader societal changes.

We intend on reaching out to the division of UWPD responsible for **Husky NightWalk**, as well as the UW Transportation Services employees who coordinate **NightRide**. Additionally, we have contacted **Karmen Schuur**, a research analyst at the Seattle Police Department working on the Micro-Community Policing Plan. Ms. Schuur has agreed to meet with us in the future to discuss how crime data is currently being used to make neighborhoods safer.

The interviews were audio recorded and the data was analyzed to identify patterns, pain points, and key findings. These findings helped us to explore potential design implications and frame the rest of our primary research.



08

Diary Studies

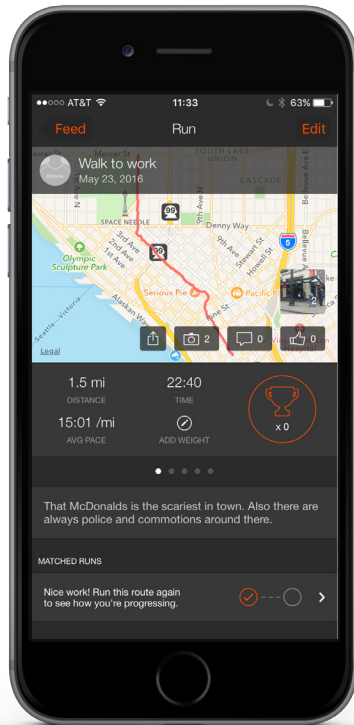
We realized that our field research activity, which consisted of walking with our participants and eliciting real-time, contextual information regarding their walking practices and feelings of safety, would disrupt their authentic experiences of walking home alone at night.

We viewed our diary study as a substitute for direct observation. We hoped to better understand what causes women to feel safe or unsafe when walking alone at night, as well as the behaviors they engage in to mitigate feelings of unease, without directly intruding on these activities. The diary we created for participants was designed to function as a design probe that would increase the participants' awareness of their own personal walking habits prior to the semi-structured interviews; we believed this strategy could help us avoid conducting interviews that would garner superficial insights. We also hoped the digital and physical artifacts of the diary study would function as recollection tools and points of discussion in our eventual interviews, a method known as photo elicitation. Photo elicitation is a method used to evoke memories that are difficult to recall through verbal prompts. We hoped to exploit this method in order to surface different, and more personally contextual information." If we have the stuff about the brain, we need to cite sources about this & I have a feeling the origin and accuracy of these claims gets into a controversial philosophical argument (i.e., not relevant to our project).

The Implementation

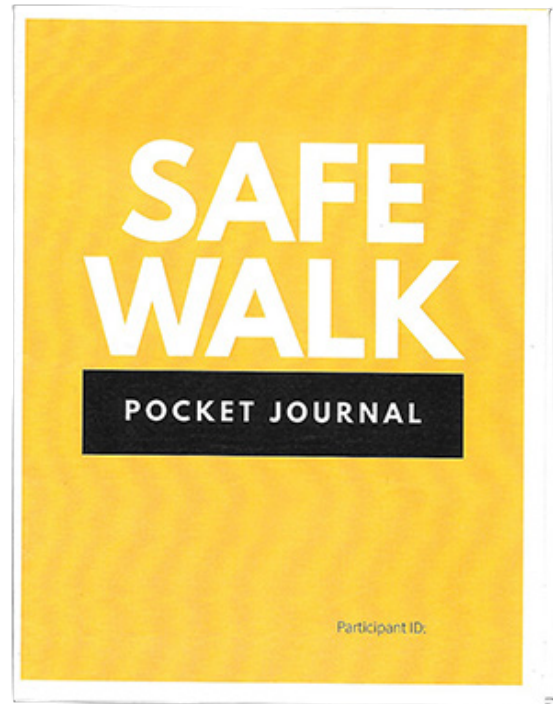
We recruited five participants and instructed them to record 3 - 5 solitary nighttime walking experiences over the course of one week. We instructed them not to embark on walks that they would not typically take because we did not want them to risk their safety for the purposes of our study. As such, we instructed our participants to record daytime walks in lieu of nighttime walks if their normal routine did not include three to five solitary nighttime walks during this week long period. Our recording process was two-fold: We instructed each participant to track their walks via the running and cycling fitness mobile app, Strava, and also had them to answer a brief questionnaire.

Strava Mobile App



We supplied each participant with a unique Strava login and password that was linked to a “master account” that allowed us to monitor whether or not participants were tracking their walking paths. This enabled us to ensure that participants were on schedule for our follow-up semi-structured interviews. During our initial “set-up” meeting with participants, we taught them how to download the app on their mobile device, as well as how to track their walks and add photos to their path.

Safe Walk Journal



We composed a brief questionnaire prompting participants to record and reflect upon their experiences of walking alone at night after route tracking with Strava.

We also gave participants the opportunity to record their walking experiences using a web form, but ultimately none of them utilized this option, opting instead for the paper journal. While most participants relied solely on Strava to track their routes, some annotated the fold-out map by hand instead.

Though research indicates that diary studies are problematic when they are the sole method of data collection (due to sample bias, changed behavior, and attrition, that is, participants discontinuing involvement in research), we intended to use the study in conjunction with semi-structured interviews to both motivate participants to complete their diaries (as they knew they would need to discuss them at their interview) and so we could cross-check the validity of diary data and ask clarifying questions as needed.

Safe Walk Journal Web Form

The screenshot shows a web browser window with the URL <https://safewalk.typeform.com/to/CYHIAK>. The page has a solid orange background. At the top, the words "safe walk" are written in a white, lowercase, sans-serif font. Below this, the text "Web Journal" is centered, followed by "Master of Human-Computer Interaction + Design" and "University of Washington". A paragraph of text thanks the user for participating in the MHCID Capstone Research Project. Another paragraph explains the purpose of the journal. A third paragraph mentions an interview and a gift card. At the bottom, there is a question about contact information and a prominent orange button labeled "Begin Journal Entry" with "press ENTER" written in small text to its right.

The screenshot shows the survey questions on the orange background. The first question is "Did you track this walk using the Strava app?". Below it is a note about Strava login and a link to email. There are two radio button options: "Yes" (selected) and "No". The second question is "How did you choose your route?". Below it is a text input field with a dashed border containing the text "Its the way I always go home at night." and a note "To add a paragraph, press SHIFT + ENTER". Below the text field is an "Ok" button with a checkmark and "press ENTER" text. The third question is "Would this route change if you had walked at a different time? For instance during the day or after dark?". At the bottom of the page, it says "4 of 9 answered" and "Create your own typeform..." with up and down arrow buttons.



09

Semi-structured Interviews

Although interview participants may speak about their beliefs and attitudes as opposed to their actual behaviors, interviews serve as a “shortcut” to obtaining answers to research questions; we used semi-structured interviews in conjunction with direct observation (that is, field research) and diary studies in order to understand the problem space from multiple perspectives. We conducted semi-structured interviews because they allowed us to gain an in-depth understanding of our target user’s perspective, needs, and desires. Semi-structured interviews allowed us to ask for clarification and follow-up questions, as well as provide us with the freedom to divert from the interview questions as need be. While the diary studies helped us identify the ways in which women negotiate space, interviews gave us the opportunity to ask specific questions regarding data collected in the diary studies, that is, questions about the interviewees’ specific walking paths. In addition to inquiring about their walking paths, the interviews allowed us to better understand the nature and experiences that contribute to participant’s fears as well as how they communicate with others about them.

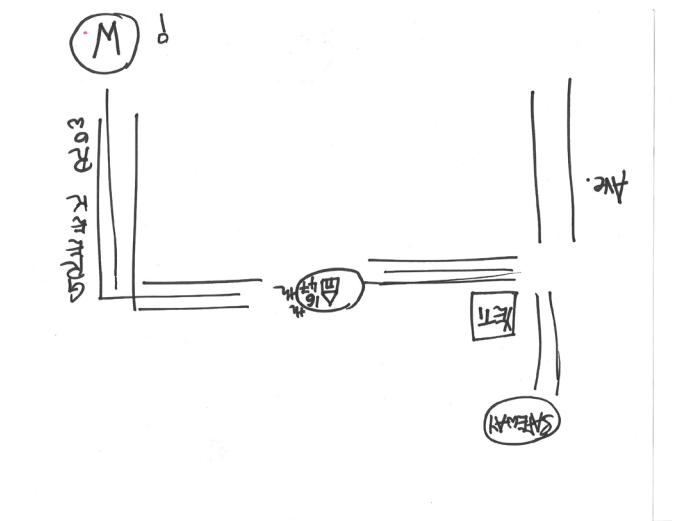
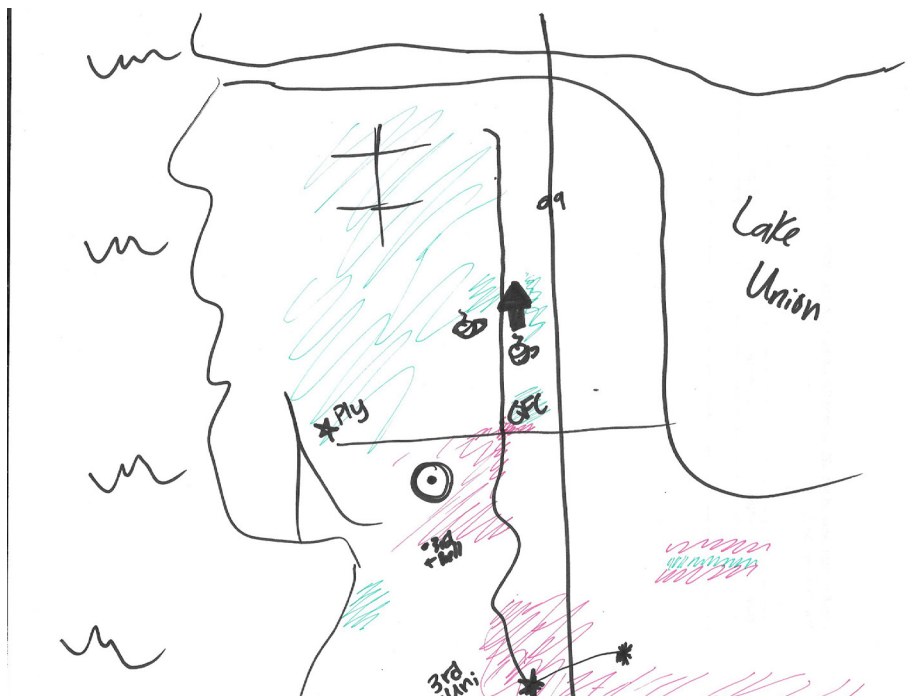
Implementation

Our semi structured interview involved four main activities.

1. Mind-map Exercise
2. Diary study walk discussion
3. Urban Map exercise
4. Semi-structured interviews.

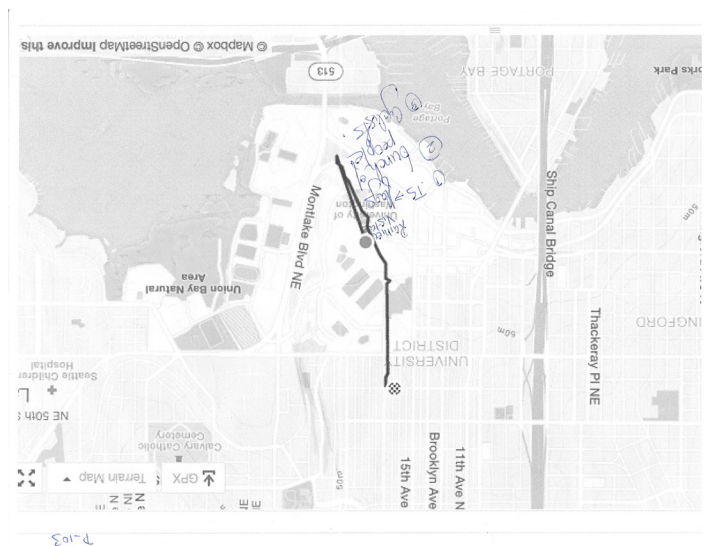
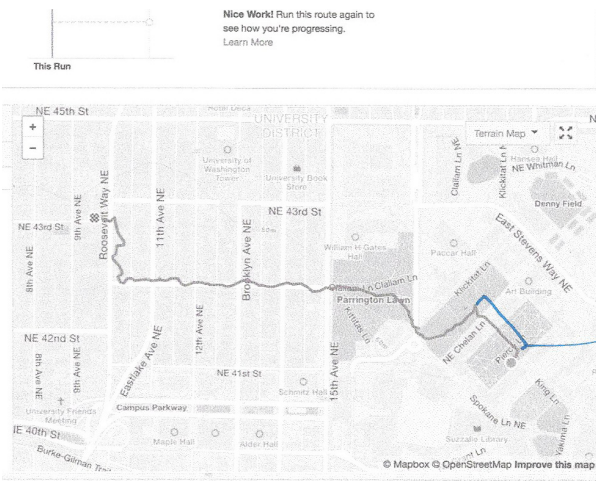
We used a **mind-map exercise** inspired by urban planner Kevin Lynch, as a warm-up activity at the start of our semi-structured interviews.

This activity consisted of participants drawing a map of their neighborhood from memory; the goal of this exercise was to understand how they perceive their physical environment by examining emphasized and deemphasized features, as well as features that were entirely omitted. We asked them to start by drawing their home and then directed them to plot out landmarks that they use to orient themselves directionally or that are otherwise important. Finally, we asked participants to show us what areas they perceive as being safe or unsafe, and asked follow-up questions about their drawings.



After the mental mapping activity, we discussed the **diary study** tracked in the Strava app and the Safe Walk Pocket Journal questionnaire

Reviewing the week's walks through routes and images printed from Strava.com, as well as the Safe Walk Pocket Journal, reminded participants of their experiences. Some participants made further annotations on their photos or maps, giving us more information about how they felt and what they saw.



DATE	START TIME	END TIME	How did you feel?
05/20	:	:	😊
Did you track on Strava? <input checked="" type="checkbox"/> N			
Why did you take this path? I think it is the shortest path home.			
Would this route change if you had walked at a different time? For instance during the day or after dark? Nope. I would still take this path.			
Did you engage in activities while walking? listen to music.			
Did anything make you feel safe? There were some Ts event guys stepping up flags. People getting out of the light walk.			
Did anything making you feel unsafe? The pebble road that has no light in that stretch.			

DATE	START TIME	END TIME	How did you feel?
05/27	8:25	:	😊
Did you track on Strava? <input checked="" type="checkbox"/> N			
Why did you take this path? I wanted to go home & feel safer walking on campus in the evening.			
Would this route change if you had walked at a different time? For instance during the day or after dark? I could have walked from the ave during the day.			
Did you engage in activities while walking? listen to music.			
Did anything make you feel safe? Campus vibe & other students walking around makes me feel safe.			
Did anything making you feel unsafe? No. Considering it was not started yet & there was little light.			

DATE	START TIME	END TIME	How did you feel?
05/28	8:00	8:50	😊
Did you track on Strava? <input checked="" type="checkbox"/> N			
Why did you take this path? It's my walk to work			
Would this route change if you had walked at a different time? For instance during the day or after dark? I have actually changed this route to go down the b/c there's more trees, less cars and don't have to walk by the McDonalds.			
Did you engage in activities while walking? Sometimes I walk with my roommate. This time I walked by myself and listened to an audiobook for knowing my route.			
Did anything make you feel safe? The areas around McDonalds.			

DATE	START TIME	END TIME	How did you feel?
05/28	9:00	9:21	😊
Did you track on Strava? <input checked="" type="checkbox"/> N			
Why did you take this path? Walking to I from yoga			
Would this route change if you had walked at a different time? For instance during the day or after dark? I don't think so			
Did you engage in activities while walking? No.			
Did anything make you feel safe? Being around places with people going out.			
Did anything making you feel unsafe? No, just that it was dark.			

We then provided participants with a **map of the city of Seattle** and instructed them to denote the areas that they are familiar with. Of these areas, participants were asked to annotate the regions they considered to be particularly unsafe. The goal of this exercise was to understand participants' general familiarity with the city, as well as elicit stories from their past walking experiences. It became evident that our participants had varying degrees of familiarity with the city of Seattle, and this realization allowed us to ask more pertinent questions in our semi-structured interviews (in other words, we didn't ask participants about neighborhoods that they do not spend time in).



Finally, we asked participants to quickly **list things that make them feel unsafe**—features of the built environment, interactions with strangers, and so on—and asked them to imagine what they would need to feel safer in the face of the items that they had identified.

Lack of lighting
 Hidey-holes
 Alleys
 Homeless people
 People talking to themselves
 Large groups of sketchy-looking people
 individual large males on empty street
 Rowdy bars

→ Secluded Areas
 → Someone following me (Ave)
 → Areas with less lighting
 → Areas with homeless people
 → New places

People, Places, Things = Unsafe

- Weapons
- Gangsta Walking
- Guys that have have baggy pants that boxers shows
- ~~People~~ gold chains
- Chains to wallet
- Hollar / cat call
- Someone follows
- Graffiti
- Cigarette, trash
- Poor taken care of houses
- club
- huddling + smoking drugs - (hiding + smoking)

- bushes
 - very still & unactive places
 - people walking my pace
 - people walking with hoodies
 - people not smiling (behind me)
 - big vans/cars stationed next to a small/tight walkway I have to pass by
 - silence
 - no streetlights
 - people under the influence

When we moved into the question and answer part of the interview (see protocol in the Appendix), we were able to reference our prior activities and stories.

The interviews were audio and video recorded and the data was coded, analyzed to identify patterns, pain points, and key findings. These findings, along with opportunities gathered from secondary research helped us to explore potential design implications.



10

Field Research

We are currently in the process of conducting field research in which we walk-along with our participants and elicit real-time, contextual information regarding their walking practices and feelings of safety. We piloted this research activity with two participants in order to determine what questions we should ask participants in order to prompt reflection on defensible walking behavior (for example, avoiding particular streets), as well as to ensure that a lapel mic would be able to properly capture audio. So far, we have conducted one walk-along, but plan to conduct at least two more before concluding this phase of our research.

On our first walk-along, we accompanied one female UW student as she walked home from class at night. During this walk-along, we observed what routes our participant took and behavior she exhibited, asking her questions about it along the way. This allowed us to better understand what contributes to feelings of safety, what behaviors she engages in to feel safe (e.g., avoiding certain streets), and if she has used any products in the space already (e.g., Companion app or carrying mace). Field research allowed us to observe our participant in a natural context, with her organic behavior when walking at night. Unlike our interview and diary study, this field study gave us the advantage of witnessing what a participant actually does, not just what she says she does. Additionally, observation allowed us to be in the actual environment and so we were able to notice problems or behaviors that our participant may not have been attentive to, and ask her about it on the spot; for example, our participant took an extremely inefficient route to get to her final destination, but did not realize it until we inquired about it.

There are some drawbacks of this method: Joining the participants on their walk home makes the activity inherently different from what we are researching, as they won't be walking alone. However, having the ability to actually see their route and ask probing questions to better understand their thoughts and behaviors during their route still made this a worthwhile choice. Understanding behaviors women already have during solitary walking surfaced current design gaps that will ultimately inform our solution.

The Implementation

In addition to the participation requirements listed in the screener, participants were also enrolled in night time courses. Two members of the research team accompanied our participant and observed her on the walk home. We prepared prompting questions (which can be viewed in the Appendix), but we also improvised as appropriate by asking questions about anything that we noticed along the walk that seemed noteworthy.

The specific questions asked were largely centered around route choice, as well as anything we noticed our participant actively avoiding (e.g. if they cross the street to avoid walking next to a construction area, we may ask them about that). We also prepared questions to determine if our participant uses any products, tools, or services to feel safer (e.g., a whistle hanging from their backpack, we would inquire about it). We audio recorded the walks and will annotate a map with the route walked along with anything interesting noticed or encountered.

SYNTHESIS

Insights

Our diary study, semi-structured interviews, and field research uncovered numerous findings that will shape our design solution going forward.

Coding

At the time of writing this, we have not yet coded the audio from our semi-structured interviews or field study. However, we have created and piloted a coding scheme that will be used to find themes in participant responses (please refer to the Appendix in order to view this document), as can be seen in the Appendix. After concluding each research activity, For all participants, immediately after testing, we wrote up a reflection document highlighting potentially significant information surfaced by our participants. The findings below are based on those reflection documents. Once we complete coding, we will revise the Insights section below with any new findings, as well as provide precise numbers for existing themes (e.g., “6 out of 7 participants felt that walking at night was unsafe”)

1. There are difficulties assessing threat, as well as fear of unnecessary escalation.

Participants expressed concern regarding over-reacting to situations where they felt unsafe, not only for fear of expediting potential conflict, but also for social reasons; reacting in a defensive manner when it proves unnecessary can be an embarrassing experience, as well as potentially offensive for the person who is perceived as the threat.

Deciding whether someone may be a threat is a complex process, relying on both internal thought and analysis of external behavior. For example, participants described determining whether or not a person was following them by using both internal perceptions and biases about what this behavior looks like, but also by employing tests via physical action (e.g., standing off to the side of the path to see if the stranger will pass by, taking an inefficient or peculiar route to see if the stranger mimics this behavior). This multi-faceted process makes it difficult to quickly identify threats with certainty. Interestingly, some participants seemed aware of their own biases embedded in assessing whether someone was a threat, but felt that their biases, while unfortunate, were justifiable in situations regarding safety and self-defense.

The fear of expediting conflict came up in a few different ways. First, some participants expressed hesitation to involve the authorities. For example, one participant, after describing an incident in which she felt threatened, said “We both thought it was super creepy, but [we] didn’t know if it was something worthy of getting the police involved. I don’t know where the lines are for that [are] to be honest.” Similarly, at least two participants were concerned by the possibility of harming another person, expressing that for this reason, they do not carry a weapon. One participant elaborated on this attitude by saying that she doesn’t want to carry a pocket knife or mace because “then you’re hurting the other person - I don’t want to hurt them, I just want to get away?” Another explained that she used to carry pepper spray, but not longer does: “I would

escalate a situation more than just defending myself. If I have a weapon, I want it to be something to protect me. Am I willing to put someone else’s life at danger? I feel mentally less burdened without any weapons to keep me safe. I read an article that had to do with shaping the whole perspective, if you are carrying a gun, if someone else has it too and they draw it on you, are you ready for that. Or if they have a knife. Are you actually ready to pull a trigger?”

Design Implications:

Participants can’t objectively assess their own risk, and they are concerned about the repercussions surrounding incorrect judgments. While it may not be possible to provide a design solution that would more “objectively” help them assess threat, there may be an opportunity to lower the threshold to seek help before a situation has escalated (e.g., by connecting them with services or resources that are less extreme than calling 911 or relying upon a deadly weapon, like a gun), or educating them on ways to defend themselves should the situation escalate.

When participants feel at risk of assault, but the situation is not yet urgent, calling 911, confronting the person they feel threatened by, or worrying friends or family feels too extreme. A design solution should empower users to take necessary steps to ensure their safety without shame. At the same time, our desire to make an ethical product, combined with participants’ concern for acting based on bias, requires that we avoid any design solutions that may stigmatize demographic groups or neighborhoods based on racial or socioeconomic biases about crime.

2. Women make strategic efforts to protect their own safety

As surfaced in the crime prevention through environmental design (CPTED) literature, women tend to feel safer when walking in built environments with specific physical and social features, and when a built environment is perceived as less safe, women tend to walk less overall (Hong & Chen, 2014). Our diary study, semi-structured interviews, and field study all corroborated this research, possibly to an even larger degree than our secondary research suggested, with some participants taking routes that we deemed surprisingly inefficient in order to feel safer. We have found that participants prefer to travel on well lit streets, construct mental maps of where open businesses are and consciously avoid what they consider to be “sketchy” areas (like the participant who made the below drawing), and mentally note where crimes have been committed.

These findings support the idea that women may choose their routes based on features of the built environment. At the same time, women do not necessarily have a choice over what route they take. For example, while residents of low income neighborhoods tend to be and feel less safe walking alone than residents of affluent neighborhoods, they tend to walk more on average for utilitarian reasons (Loukaitou-Sideris, 2006). Anecdotes in our interviews echoed the reality that women do not always have the choice to decide where and when they walk; for example, a diary study research participant described an instance in which she was arriving at Seattle late at night after being out of town, and because she did not have any food at home she was forced to walk to Safeway.

In addition to planning routes perceived as being safer, women employ personal strategies to promote their safety. As one participant said, “You have to think about it. At the end of the day you are responsible for your own safety. No one else is going to do it for you.” Participants reported using a wide range of

strategies such as carrying weapons or tools that can be used as a weapon, dressing conservatively when they know they will be walking alone, actively attending to their surroundings (that is, staying alert), holding their keys between their knuckles, walking less at night, and even avoiding walking alone entirely.



Interestingly, while there are clear themes in the features of the built environment that tend to correspond with perceived safety (e.g. avoiding dark, narrow areas like alleys), the participants' specific strategies outside of route planning are somewhat idiosyncratic. For example, some participants communicate their routes and walking plans with others while others don't, and some participants carry weapons, while others don't. Relatedly, women's planned responses to attack vary: some would run, some would call for help, while others

would try to fight back. Interestingly, two participants described using a tactic of engaging with the person they feel threatened by to ‘throw them off,’ with one saying “I joke it off, laugh along. I don’t ignore people if I feel threatened. I try to play along or confuse them. Giving off a negative or pushy response is very dangerous.”

Further complicating the issue is the fact that an individual’s response may be affected by their understanding of why something may be a threat. For example, one participant referenced feeling less safe around homeless people because they are in need and thus might want to steal something from them, while another believed that homeless people were unsafe because they suffer from mental instability. While we did not directly test for this in our research, we believe that it is a logical assumption that the attributed source of fear could influence strategies to respond to that fear (e.g., it seems likely that you would respond to someone differently based on whether you think they are harassing you due to mental illness versus whether they plan to rob you).

Design Implications:

Given the high tendency to plan routes based on features of the built environment and the common opinion of what features constitute a safe route, providing users with knowledge of the features of the built environment may help women plan routes that they feel and are safer in. Importantly, women are attempting to solve the problem, but experiencing trade-offs between safety and freedom of movement. We should be careful not to strip women of their autonomy in society by putting limits on the places they feel comfortable in and by further contributing to the societal problem that women only belong in certain spaces at certain times (Koskela, 2000).

The fact that women are actively taking steps to promote their own safety means that a design solution should leverage this desire, but also potentially attempt to compliment and accentuate these existing strategies. Given the individual differences in personal strategies, we should be mindful not to create a one-size-fits-all solution and should either narrow down to a specific target user or allow for personalization in a design.

Lastly, a design solution should recognize that women do not always have a choice of what route they take. For example, if a user lives or works in an unsafe area, she doesn’t have the option of simply avoiding it- therefore a design solution should suggest the safest course of action, rather than one that meets a uniform criteria of “safe” (Koskela, 2000). Similarly, design solutions should provide options for individuals who have no control over the direction of their route by offering functionality or resources independent of route planning.

3. Women feel safer around and seek out the presence of other people.

Not surprisingly, what makes our participants feel safer when walking alone is feeling less alone. For example, all of our participants described strategically planning routes that would place them in more populated areas. This notion of being around others feeling safer is also backed up by a robust amount of academic literature that has found that people tend to feel safer walking on more populated streets (Hong & Chen, 2014; Brown, et al. 2007; Loukaitou-Sideris, 2006).

Unexpectedly, efforts to reduce aloneness went beyond walking in more densely populated areas. Multiple participants mentioned that when they feel uneasy while walking, they will use their phone to chat with someone during their walk. Interestingly, this was not necessarily to let others know they felt afraid, but simply being on the phone with someone helped them feel safer. Similarly, some participants involved others (typically a roommate or romantic partner) in keeping track of their safety and whereabouts by letting them know when to expect them to arrive at their destination.

Decreasing aloneness while walking may be the single most important factor to feeling safe while walking. In all interviews, participants, often unprompted, mentioned attempts to be less alone while walking, typically bringing it up several times.

Design implications:

A design solution should leverage the comforting power of having others present, if possible. Both in the moment of perceived threat and, more generally, there is an opportunity to target the increased comfort that women feel while walking with an increased presence of others (e.g., a solution may help women be in touch with others when they feel uneasy, or involve community walking efforts to decrease walking alone in general). A design solution should not ignore or underestimate how important social presence is to feeling safe. If a design solution does involve incorporating strangers, it should take measures not to put women at risk by doing so.

4. Communication of fear is an ongoing issue.

Contrary to participants feeling safer when less alone, we have found a general silence around women openly communicating their fear. Citing reasons like being embarrassed about being afraid, an insecurity about whether their fear is justified, not wanting to worry people (e.g., when discussing whether her parents were aware of her late night walking behaviors and the high number of UW Alerts she receives, a participant said, “I didn’t want to worry them. The less you know the better you sleep”), female-identifying individuals may not reach out for help.

Participants are afraid of others knowing about their fears in all parts of the walking timeline: they are embarrassed to communicate to others before their walk that they don’t feel safe being alone, they are embarrassed to communicate to others that they feel afraid during their walk, and after an incident occurs, they are embarrassed to report it or discuss it with friends and family.

Part of this problem might be related to the information that women receive from an early age that they are responsible and accountable for their own safety and are exposed to news media which frequently blame victims for assault (Koskela, 2000). For example, one of our participants told her mother about an incident in which she and her cousin were followed by a car when walking at night, prompting her mother to respond by saying “I told you not to go out at night.” This incident caused our participant to resolve not to communicate with her mother about incidents of this nature in the future. For fear of this same response, her cousin never told her own mother about the incident.

Additionally, we learned that the nature of individual relationships, as well as previous social contact prior to the moment of fear, may influence an individual’s likelihood of

reaching out. For example, one participant explained that it’s not a convention nowadays to call someone out of the blue and so if she felt afraid while walking, she would only feel comfortable calling someone if they had already been talking on the phone earlier that day and she could just continue the conversation (yet, she would still not explain that she was afraid, she would just call them to feel less alone). Similarly, a participant explained that she may tell her boyfriend that she feels afraid, but not friends. Another participant was not in open communication with her fiancé or friends about her fears while walking, while another participant felt comfortable and was able to overcome hesitation and ask her male friends to help her get home safely by either driving or walking her to her end destination. Another example demonstrating variability according to relationship type is depicted by a participant that said she felt safer walking with men than women because of a prior incident when she and another woman were followed; the other woman panicked rather than trying to escape, and so the participant learned she couldn’t trust women to respond to fear in a practical way.

Design Implications:

There is a clear opportunity to lower the threshold for women to communicate their fears around walking. More broadly, there may also be an opportunity to grow the conversation on a community scale, thereby normalizing the conversation. In both of these situations, we should allow users to define their own relationships and communication styles and we should not assume that there is a one-size-fits-all approach to relationships like “parent”, “best friend”, or “boyfriend”.

CONCLUSION

Next Steps

We are currently in the process of coding our semi-structured interviews in order to surface additional findings. We intend to use this information to create visualized user experience maps. We intend to map out the potential solution space and represent how individuals behave, as well as what interpersonal activities they engage in and how social and governmental entities respond to female-identifying individuals' perceptions of fear. Individuals may choose to engage in defensible behaviors, like carrying mace, or, they may choose to reach out to friends for support, the police for intervention, or engage in a community dialogue regarding hostile walking environments. We believe that once we examine these different levels of response we can focus on ideating for each specific category, as well as identifying solutions that span categories. We also intend on creating a more intuitive visualization of our competitive analysis so that we may more easily identify patterns across existing products. We believe visualizations of our synthesized findings will aid us tremendously as we attempt to brainstorm potential design interventions.



RESEARCH

- Continue* Field Studies
- Observational Activities
- Solution Space Analysis

SYNTHESIS

- Code Interviews
- Competitive Analysis Visualization
- Individual Synthesis
- Group Synthesis

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APPENDIX



Appendix

A. Competitive Analysis Summary

1. Revolar

Overview:

Revolar is a wearable device that sends a discreet call for help when the wearer squeezes it. Squeezing the button twice sends a “yellow alert,” indicating that the wearer is uncomfortable or needs to get in touch with his or her contacts. “Revolar contacts” don’t need to have the Revolar app in order to receive alerts; a text message is sent to contacts with an active GPS link containing the wearer’s location. Rapidly pressing the button three times sends a red alert, indicating that the wearer needs professional help.

A concave, 360 degree shape makes it easy for the user to place their finger on the button and press it without needing to directly look at it. The Revolar connects to the companion app via Low Energy Bluetooth. Once the device and app are paired together, Revolar users enter “Revolar Contacts.” Users must have a conversation with their contacts about how different alerts are defined, making the device fully customizable. Users can also activate alerts directly from their phones, if necessary. If a user triggers an alert, the alert is accompanied by instructions for the contact to follow in order to help the user. Users can also opt into a subscription based 24/7 professional monitoring service for \$9 a month.

Marketing Material:

Revolar’s website frames the device in the context of founder and CEO Jacqueline Ros’s personal experience with sexual assault. Ros’s younger sister was assaulted as a teenager, and Ros “found herself wishing her sister had been able to simply press a button to call for help.” Revolar became that simple button, and Ros and her team view themselves as being “allies and survivors [who are] committed to building safety technology to empower people to keep themselves and those they love safe.”

Revolar’s tagline is “activate your intuition” and the site urges users to think of personal safety as being synonymous with the Revolar brand. The company describes their device as being a tool for

“empowerment,” and claims that the data the device has collected has “shed light on the reality of assaults and has helped to educate the masses on this reality.”

Revolar also bills itself as being a utilitarian tool, “Unlike other wearables, Revolar believes in function over fashion. Our button is discreet and can be either hidden under your clothing or clipped onto your keychain.”

Press:

In news media, Revolar is frequently referred to as a tool to combat sexual assault. Articles published in VentureBeat, iDigitalTimes, Fast Company, The Huffington Post, and Mic all discuss Revolar in the context of sexual assault and its statistical likelihood of affecting women; for example, “one in five women in the U.S. are raped at least once in their lifetime.” These articles cite personal stories from sexual assault survivors, and discuss the negative psychological and physical ramifications of the attacks on said survivors. Revolar is described as a potential solution for lessening the frequency of attacks. Jacqueline Ros, Revolar CEO, is quoted talking about the notion of a “magic button” that could keep women safe.

The most salient insights from news media regarding Revolar are as follows:

- Revolar received \$3 million in funding from The Foundry Group. The Founder Group also provided FitBit with funding.
- A subset of the articles describe Revolar as being a “non-violent” method for increasing personal safety.
- In interviews, Ros has stated that Revolar’s usefulness extends beyond scenarios in which a user is walking alone at night. In theory, the device could help individuals with severe allergic reactions, as well as those who have fallen or injured themselves significantly. According to Ros, “People in the hearing-impaired community told us this could change their lives.” This belief that the device should not be constrained simply to solitary walking scenarios has led the company to express an interest in creating other types of wearable devices, including tools for solo running and travel.
- Ros does not consider Revolar to be a panic button, “we believe our product helps people live more empowered and free lives. We encourage our users to use their Revolar before they reach a ‘panic’ situation.” Ros has also been quoted as saying that “Many people in these situations are afraid to cry wolf, but their instincts are telling them that something's wrong and they want to get out. We want to give them an easy way to get out of a bad situation.” Yellow alerts are meant to provide users with a way to contact loved ones in an uncomfortable situation without “crying wolf” and involving authorities.

- Revolar asserts that their mission is to combat rape culture through the use of their wearable devices. Articles cite the fact that Revolar “doesn’t actually stop an attack from happening” to which Ros contends that the purpose of the device is to “build communication between loved ones and educate people about the need for empathy between genders.” Ros states that, “[Revolar’s] goal is constant innovation and we strive for excellence, but beyond that, we want to start a conversation. We want to be able to talk about subjects like sexual assault. We want to communicate the fact that not all men are doing these things -- that it’s these repeat offenders perpetuating the problem. I do believe that we can teach men to not rape; but education takes time and in the meantime, I don’t want to risk my loved ones.”
- Although Revolar is attempting to reduce sexual violence, it appears as if a competitor product, ROAR, is outperforming Revolar in this arena. ROAR is described as not relying solely on hardware and software to bring about change. Instead, the company also donates some of its profits to “charities dedicated to tackling sexual assault through education.” ROAR co-founder, Anthony Gold, describes ROAR’s mission thusly, “We don’t want to just put a band-aid on the problem of violence against women. We want to get to the root causes. And by partnering with organizations that are focused on teaching young boys—and girls—about empathy, respect, and consent, we know the positive change can result.”

Relevant Articles:

- <http://www.idigitaltimes.com/revolar-magic-button-kickstarter-alerts-loved-ones-when-you-are-danger-425071>
- <http://venturebeat.com/2016/01/04/startup-revolar-wants-to-take-on-rape-culture/>
- <http://www.fastcompany.com/3047151/can-wearable-tech-combat-sexual-assault>
- http://www.huffingtonpost.com/lisette-calveiro/wearable-technology-contr_b_9750650.html
- <https://mic.com/articles/135643/how-denver-became-an-unexpected-startup-mecca#.aQ7UWwThA>

Product Reviews:

It is exceedingly difficult to find user product reviews for the Revolar. The device is sold through Brookstone’s website, and it has only gained four reviews, all of which are positive with the exception of a single outlier.¹ The device is also sold through Amazon, but does not have any reviews.²

¹ <http://www.brookstone.com/revolar-wearable-personal-safety-device/315263p.html>

² http://www.amazon.com/REVOLAR-Revolar-Wearable-Safety-Device/dp/B01EIS49S8/ref=sr_1_1?ie=UTF8&qid=1464575076&sr=8-1&keywords=revolar

The device is not sold through Fry's Electronics or Best Buy. It appears as if it is primarily sold through the company website.

2. LiveSafe

Overview:

LiveSafe is an application intended for usage by both enterprise and higher education institutes. The app is meant to facilitate two-way, real-time communication between users and authorities, as well as between peers, regarding suspicious activity. Interactions supported by the app include location-tagged texts, calls, photos, and videos, as well as scalable mass notification. LiveSafe's SafeWalk feature allows users to share their location with three contacts who can either actively monitor the user's location, or be placed on standby. Users can also view a map and list of reported suspicious behavior. The app is customized to each university or corporation.

Marketing Material:

LiveSafe advocates the adage "see something, say something" and is endeavoring to provide users with a tool to act upon this concept. App founders, Shy Pahlevani and Kristina Anderson, are survivors of a violent robbery and the Virginia tech shootings, respectively. LiveSafe claims to use "crowd sourced intelligence to engage the community to help prevent incidents and improve over all safety."

Press:

The most salient insights from news media regarding LiveSafe are as follows:

- As of December 2015, LiveSafe raised \$4 million in venture capital. This Series A funding came from Hearst Ventures and IAC.
- Carolyn Parent, the company's president and chief executive, frequently discusses the concept of empowering users to take control of their personal safety. Parent also talks about the notion of notifying authorities "without necessarily getting involved. There's not an easy way for people to share their concerns without calling 9-1-1 or filing a report, which people are very apprehensive about taking that step. We're really trying hard to make it easy for people to participate at the level that they feel comfortable with." The University of Cincinnati has deployed the app on its campus, and Michele Ralston, UC public information officer, echoed Parent's sentiments, "Often if [students] wanted to share something with the police, they may or may not want to disclose their name. Using the anonymous feature, you just click the button and it sends the information without

saying who you are.” According to Ralston, anonymity is not only crucial from the standpoint of mitigating reporter discomfort, it can also protect individuals in dangerous situations, “A phone call could give away what you're doing,” Fischer added. “And a text message can be quick, anonymous.” Former LiveSafe chief executive, Jenny Abramsom offered similar comments, “Most students these days barely call their parents. It’s not strange that they don’t want to call safety officials.”

- More than half of college students in Virginia have access to the app. Some news outlets discuss LiveSafe in the context of parental anxiety, “It can be nerve-wracking for parents, but there's an app called LiveSafe which is designed to help students report suspicious activity digitally and give families a new way to stay connected.”
- The company plans to expand the app’s feature set so that it includes a mechanism for corporate employees to report workplace harassment, theft, and assault.

Relevant Articles

- <https://www.washingtonpost.com/news/on-small-business/wp/2015/12/03/livesafe-announces-new-ceo-4m-in-funding/>
- <http://www.wlwt.com/news/campus-safety-app-livesafe-puts-crimefighting-tool-in-students-hands/39575836>
- http://dealbook.nytimes.com/2014/03/25/livesafe-a-mobile-safety-app-raises-6-5-million-from-iac-and-others/?_r=0

Product Reviews

The app has an average 4.2/5 rating on the Google Play store, based on 301 total votes.³

Although the app has generally positive reviews, it appears as if it’s SafeWalk monitoring feature is less than optimal. For example, one customer had the following to say, “This is great, but unless someone watches non stop there's no button, or history for them to see you actually did make it home. I mean you can call and such but its be good if a notification popped up once they were home.” It also appears as if the app has not partnered with a wide range of safety officials; many users have voiced concerns that the nearest safety officials are hundreds of miles away from their current location. It also appears as if the app is frequently used to report instances of animal cruelty.

³ <https://play.google.com/store/apps/details?id=com.livesafe.activities&hl=en>

When viewing the application on the iTunes store, the following message appears in regards to customer ratings, “We have not received enough ratings to display an average for the current version of this application.” However, it appears as if the average rating for previous versions of the application is roughly 4.5/5.⁴

3. Companion

Overview:

Companion is an app that allows users to input their destination and indicate the mode of transportation they will take to get home. Users can designate friends and family as “companions.” Said companions can monitor the user’s whereabouts in order to make sure their loved one has arrived home safely, with or without having the Companion app downloaded. Users can contact their companions or the local police department via a single tap of a button on the app’s interface. Companion collects information from users in an effort to “identify sketchy areas.” This information is then passed on to “public safety.”

Companion can instantly send alerts to companions if the user is affected in the following capacities: headphones are pulled out of the smartphone; the phone is dropped; users do not reach their end destination; the user begins to run. In these scenarios, the app prompts the user to indicate what happened. If the user does not respond within 15 seconds to confirm that they are safe, the app will automatically send a “Smart Trigger” to user’s designated companions.

Marketing Material:

Companion uses rhetoric to suggest that it believes its users should be able to use the company’s “personal safety network” to indicate when they are feeling uneasy, despite the scenario not being an obvious emergency. Companion claims this information will be used to affect change in the future, “Help the community identify sketchy areas. We’ll make sure to pass this info onto public safety to make your next walk home even safer.” The company also extols the virtues of vigilance, “Companion works in the background. Simply start a trip and place your phone in your pocket. Focus on staying safe, not setting up a timer or keeping your finger pressed down.”

The company frequently appeals to the student perspective. The app was built by University of Michigan students who cite personal experience with the issue of nighttime walking safety. They indirectly reference influence from the media as a factor in creating Companion, “We’ve also noticed an increasing trend (or at

⁴ <https://itunes.apple.com/us/app/livesafe/id653666211?mt=8>

least publicity) of students disappearing, being sexually assaulted, or murdered while walking alone late at night. Back at school in Ann Arbor, it seems like we get a crime alert email nearly every other day.” The app developers also appeal to the parties indirectly affected by solitary student walking, “Our moms, who also get these alert emails, often forward them on to us to make sure we are aware.”

The app developers also recognize that students frequently find themselves walking home alone because it is the only viable option, “On a college campus, walking is almost always the transportation method of choice. Most people don’t have cars, cabs can get expensive, SAFE rides are inconvenient, and the bus is either hit or miss. Besides, on most campuses things are pretty tightly packed. In Ann Arbor, nothing is usually ever further than a 15 minute walk away. After a long night of studying at the library, hanging out at a friends house, or leaving a party early, walking home is often the most practical option. Yet with rampant crime alerts, increasing sexual assaults and other violence issues, few actually feel safe when doing so.” They fail to acknowledge the social anxiety inherent in asking for help; perhaps a 15 minute walk is not “convenient,” perhaps it is viewed as an inappropriate (read: trivial) amount of time to burden another person with. In this vein, the app developers seem to misunderstand where the burden of responsibility is (or should) fall, “you shouldn’t have to worry about letting someone know your constant location or *if* you make it home safely. Companion does this for you, making your safety convenient and seamless. Watching your friend’s back (and having them watch yours) is now just a few taps away.” Although this is convenient for the walker, it still necessitates a certain amount of attention from the companion that many individuals may not feel comfortable asking for.

Companion’s design decision is born from the following hypothesis (derived from competitive analyses), “People are lazy. Sure they want to feel safe, but many of these solutions made them jump through extra hoops or set off false alarms way too often.”

Press:

The most salient insights from news media regarding Companion are as follows:

- The company plans to create an Apple Watch app capable of detecting heartbeat irregularities and spikes, which they believe are an indicator that the user is in an abnormal situation.
- According to Companion co-founder, Danny Freed, the app is evidently gaining recognition amongst college campuses, “We’ve seen that people have the app open, or they’re using it during a trip, and they have peace of mind.” The company is trying to spread the word of their app by mimicking Yik Yak’s strategy of reaching out to school ambassadors, “The real growth should start to come once we have ambassadors on the ground at schools. We’ll start to get some power from

the virality of being on a college campus.” Since August 2015, when the second version of the app was launched, Companion app developer, Katie Reiner, stated that, “We’ve had over 500,000 sign-ups in the last week.”

- Companion partners with local law enforcement to provide data about “where people are feeling nervous around the surrounding Ann Arbor area.” However, partnering with safety departments outside the University of Michigan has been, in the words of Freed, “painfully slow.” Nevertheless, Companion has “at least one data point in every state where someone has felt nervous.”
- The app was born out of the observation that Michigan students frequently receive crime alerts, but infrequently use the emergency blue light stations installed across the campus.
- Companion believes it is unique because it is specifically target towards students, “Reiner added that none of the apps on the market at the time ‘seemed cool or hip’ to use, and none targeted students.”
- Some articles challenge the claim that Companion can keep you safe, but instead advocate for its desire to make information visible, “Can a smartphone really keep you safe? On the face of it, the answer is, of course not. A phone can’t protect you from violent crime any more than a PC or a tablet computer. But information is power, as they say, and the combination of a smartphone’s data, location technology and innovation can keep you out of some kinds of trouble.”
- *Fortune* writer, Christopher Elliot, reached out to Companion in an effort to be connected with “satisfied people,” individuals who have “found themselves in an unsafe situation and were helped by Companion.” Lexie Ernst, Companion co-founder, told Elliot that, “We have no concrete examples of someone being saved by our app. However, we have heard many people say that they love using Companion with their kids who walk alone to a bus stop early in the morning, with their family/friends studying or traveling abroad, and even people using it with their elderly parents or grandparents. Overall, it’s a great way to keep in touch!” Elliot was quick to point out that software developers typically “keep a list end- users who are willing to share their stories with the press.”

Relevant Articles:

- <http://www.techinsider.io/companion-app-may-help-you-feel-safe-2015-8>
- <http://college.usatoday.com/2015/09/11/companion-app-promises-youll-never-walk-home-alone-again/>
- <http://fortune.com/2015/09/22/companion-app-safety-travel/>

Product Reviews:

The app has an average rating of 3/5 stars on the Google Play store, based on a total of 2,780 reviews. Over 25% of reviewers gave the app 1/5 stars. User dissatisfaction seems to stem from multiple sources including the app's inability to accurately track a user's location (or, set a destination), it's hypersensitivity, and its propensity to drain cell phone battery life.⁵

The current version of the Companion app has a 3.5/5 rating on the iTunes store, based on a total of 6 reviews. Prior versions of the application also have an average rating of 3.5/5, based on 380 ratings.⁶ iOS users reported similar issues with the application as Android users, namely, it's inability to accurately track location. For example, "One night, I decided to use it on a 4 block walk in downtown Los Angeles. My friend messaged me, "I don't see you. Turns out that the app told her I got to the destination already when in fact I had just left my car. I got to my destination safely thankfully, but that is a very dangerous bug."

Reviews are decidedly mixed. For example, one iOS user had the following to say, "I feel ten times safer walking home [with Companion]. I constantly get approached by strange men and the 'I feel nervous' button is an awesome idea." However, another customer raised concerns regarding the app's reliability, claiming the app was sending her "return receipts" when in fact her companion - her husband - had received no such notifications. She described the app as being "dangerous and deceptive."

4. Circle of 6

Overview:

Circle of 6 was originally designed to help college students prevent sexual assault, but it's usefulness extends to communities that include teens, family, and friends. The app allows you to indicate up to six contacts that you would like to include in your "circle." Users can send text messages to their circle indicating a variety of needs from a conversation, a phone call, or retrieval of some sort. The app also includes information about sexuality, relationships, and safety, as well as access to specialized help hotlines (LGBTQ, Spanish-language, etc.). The company also offers Circle of 6 U, customized university specific versions of the traditional app. The app won the White House/HHS "Apps Against Abuse" Challenge.

Marketing Material:

Circle of 6 was born out of the White House "Apps Against Abuse" challenge, an initiative spearheaded in 2011 by Vice President Joe Biden and Chief Technology Officer, Aneesh Chopra in an effort to "inspire

⁵ <https://play.google.com/store/apps/details?id=io.companionapp.companion>

⁶ <https://itunes.apple.com/us/app/companion-never-walk-alone/id925211972?mt=8&ign-mpt=uo%3D4>

citizens to build a mobile tool to prevent sexual violence on campus.” Circle of 6 creators describe their entry into the challenge as a “public health approach” to solving the issue.

The company’s rhetoric frequently mentions the concept of community and all inclusiveness, “Originally designed for college students to prevent sexual violence, we also know it’s handy for teenagers, parents, friends, or all communities seeking to foster healthy relationships and safety.” As per the site’s own description “Circle of 6 is for everyone.” Circle of 6 CEO, Nancy Schwartzman, describes the app’s guiding principle thusly, “Safety is about communities making decisions to support each other. We built circle of 6 so that young people can feel more confident on the street, at parties and in their relationships.”

Circle of 6 Creative Director, Thomas Cabus, describes the app as such, “We designed Circle of 6 to feel like a lifestyle app and to be discreet. Because a third party won't assume it's a safety app, the user has more privacy to ask for help.” Discreteness and privacy are seemingly huge concerns for the company, as it’s importance is reiterated multiple times, “We know how hard it can be to reach out when you need help, or to talk about things that are awkward, confusing - or worse. We respect your privacy and collect no personal data, so you can be comfortable making choices and asking for help while using our app. We’re inspired by stories people share from around the world about staying connected, helping each other and feeling more confident because of Circle of 6. Our goal is to make the world a safer and healthier place with technology that enhances friendship and trust.”

The app currently boasts 300,000 users across 36 countries.

Press:

The most salient insights from news media regarding Circle of 6 are as follows:

- Circle of 6 is viewed as a tool to better enable and encourage bystander intervention, “According to Meg Bossong, the director of sexual assault prevention and response at Williams, the most powerful part of the Circle of 6 app is the fact that it empowers not just potential victims, but also bystanders, to act. ‘Students are very interested in figuring out how to make campus safer,’ she says, ‘but they’re not exactly sure how to do that or if they’re being asked to do that. This is a great way to let people know when they need help.’”
- Williams College is using anonymized data collected from Circle of 6 to improve the campus climate, “Williams is also working with Circle of 6 to collect anonymized data on how people are using the app—whether they’re regularly asking friends to come get them or tapping into the app’s on campus resources—and using that to inform their on-campus prevention courses.”
- The director of sexual assault prevention and response at Williams, Meg Bossong, believes that Circle of 6 does *not* place the “onus of prevention” on women, “This is about building the culture

we want on our campus, a culture in which people feel someone will have their back and a culture in which people feel they owe it to the community to make sure it's safe. Risk reduction technology, like nail polish, takes for granted that it's going to happen and don't push for cultural change." However, Circle of 6 founder, Nancy Schwartzman is "the first to admit this tool is just that: a tool, not a solution."

- Williams College believes the tool is being leveraged to help not only friends, but also strangers, "[Of] The 1,500 students surveyed, over 52 percent said they had intervened in situations—even without knowing the students involved. So the ethos of Circle of 6 and a small circle of connection is rippling outward into larger communities of care."
- Articles discuss the potential usefulness of Circle of 6 outside the context of extreme emergency scenarios, "if your car's broken down and you need a lift, one tap sends your friends a message saying you're in trouble along with the address where you are so they can pick you up. If you're in the middle of a horrible date and need a distraction, the app can help with that too."
- The notion of a "circle" of acquaintances sprung from the notion that circles are healing, "It's great for conflict resolution, and all these dynamics of the circle. And I'd done a lot of studying of restorative justice and justice that works outside of the criminal system where circles are used, like healing circles or community circles, so we loved that idea. Six seemed like a number big enough that if you were in trouble, someone would be able to respond, and small enough that this is intimate and these are people you actually know."

Relevant Articles:

- <http://www.wired.com/2014/09/circle-of-6/>
- <http://fusion.net/story/262256/app-smart-phone-police-killing/>
- <http://lifehacker.com/5941286/circle-of-6-for-iphone-and-android-prevents-violence-gives-you-a-way-out-of-dangerous-situations>
- <http://mediashift.org/2012/09/circle-of-6-mobile-app-helps-prevent-violence-sexual-assault-on-campus263/>

Product Reviews

Circle of 6 has an average rating of 4/5 stars on the iTunes store, based on 47 reviews.⁷ The only customer review for the application simply states, "App keeps crashing." The university-branded version of the app, Circle of 6 U, has an average rating of 2/5 stars, based on five ratings. The single customer review for this variant of the app describes a bug in the app that will not allow the user to sink his or her contacts.⁸

⁷ <https://itunes.apple.com/us/app/circle-of-6/id507735256?mt=8>

⁸ <https://itunes.apple.com/us/app/circle-of-6-u/id909849733?mt=8>

Circle of 6 has an average score of 4.4/5 stars on the Google Play store, based on 105 total reviews.⁹ Reviews of the application seem to suggest that the app is stringent in its requirement of inputting six contacts, something users are not necessarily comfortable with, “My understanding was 6 contacts were NOT required. I have less than 6 I'd want contacted in an emergency. The app would not operate without 6 contacts listed. Uninstalling and searching for a better option.” Another user review summed up the inherent flaw in this scheme even more concisely, “Don't have 6 contacts I'd want to share with.” Circle of 6 U has an average rating of 4.5/5 stars on the Google Play store, based on 15 reviews.¹⁰

5. Hollaback

Overview:

Hollaback is an activist run application intended to “end harassment in public spaces.” The app allows users to access “Resources” as well as a “Know Your Rights” page. It also includes a map that denotes street harassment clusters with balloons. The application provides users with a method for documenting and sharing instances of street harassment. Users can post incidents in addition to plotting location manually or via GPS. Users can indicate the type of area in which an instance took place (borough, school, business), as well as demographic information (race, gender). Users also have the ability to attach a picture of an incident they either personally experienced or witnessed. Users can opt to share these reports by sending them to their district’s database, as well as Councilstat.

Marketing Material:

Hollaback does not describe their app as a product, but rather as a “movement to end harassment powered by a network of local activists around the world.” In their estimation, harassment is about “intimidation” intended to make a harasser “feel powerful.” The Hollaback app allows users to “take that power away” by publicly denouncing it. The app allows users to document incidents of harassment and share and map them through the Hollaback app. The company’s vision involves “a world where harassment is not tolerated and where we all enjoy equal access to public spaces.”

Press:

The most salient insights from news media regarding Hollaback are as follows:

⁹ <https://play.google.com/store/apps/details?id=com.circleof6.v2&hl=en>

¹⁰ <https://play.google.com/store/apps/details?id=com.circleof6.williamsuniversity&hl=en>

- The app has inspired reporters to question how street harassment is defined and “who determines how it should be punished, if at all.”
- Hollaback co-founder, Emily May, has stressed that the organization’s mission is not at odds with the public’s desire for “community-based responses that are about education and mobilization [rather than] more police responses.” For example, in the past Hollaback has organized safety audits intended to determine the conditions of areas in which pedestrians seem particularly susceptible to harassment. This effort resulted in government action, “Council member Ferreras coordinated with the group to conduct the first one in Queens last year. The patrol resulted in the replacement of street light bulbs and working payphones, which May says ‘make a space feel safer, and therefore be safer.’”
- Hollaback Deputy Director, Debjani Roy, describes harassment as “an isolating experience” and that the Hollaback app “seeks to change that, allowing for people to share their everyday realities with their communities to receive support and, importantly, recognition that this is a real problem.”
- May had the following to say when prompted about the future of Hollaback, “Cultural change is the piece that underpins all of this. We’re not looking to increase criminalization—we’re looking for community accountability.”
- Other articles describe street harassment as Hollaback as an app that lets you “report and map street harassment, because the shame is on the perpetrator, not the victim” and an app that intends to change the “culture of victim-blaming into one where harassers take the blame and victims receive the support they need.”

Relevant Articles:

- <http://www.theatlantic.com/technology/archive/2013/09/an-app-to-help-women-avoid-street-harassment/279642/>
- <http://www.dailydot.com/lifestyle/hollaback-woman-app-street-harassment/>
- <http://www.bustle.com/articles/109913-the-new-hollaback-app-lets-you-report-and-map-street-harassment-because-the-shame-is-on>

Product Reviews:

Hollaback has an average score of 3.7/5 stars on the Google Play store, based on 105 reviews. Many users were dissatisfied with the app due to the fact that they were unable to select a local chapter.¹¹

¹¹ <https://play.google.com/store/apps/details?id=org.ihollaback.android&hl=en>

Hollaback has an average score of 3/5 stars on the iTunes store, based on 42 ratings. Reviewers were unhappy with the app due to its apparent buggy features.¹²

6. ROBOCOPP “Sound Grenade”

Overview:

The Sound Grenade is a personal alarm that is activated via a pull-pin action. The device weighs less than an ounce and can be clipped to clothing, a keyring, or a backpack. It is intended to act as a deterrent to attackers, as well as animals. ROBOCOPP has gained positive press from a variety of college campuses, and is even branded towards college students with devices emblazoned with a university’s logo.

Marketing Material:

The company’s site boasts that the ROBOCOPP is capable of producing a “120-decibel SOS alarm” when the device’s pin is pulled. The site recommends fastening the device to a keychain, backpack, or lanyard. The robocopp.com website positions the device as an outdoor safety tool. For example, the site describes the devices as such, “Weighing less than an ounce, and able to be easily clipped to a key ring, backpack or clothing, it acts a useful deterrent to both potential attackers and wild animals.” The Sound Grenade is one of the only devices to feature testimonials from male users, including the following, “I am currently in Guatemala and have a job that requires me to travel a lot to foreign countries. I am a big guy, so I don’t worry too much, but it helps me feel a little extra safe when I’m forced to walk home alone at night.”

ROBOCOPP has created a secondary site, robocoppcampus.com, to promote the device as a tool for campus safety. The company claims that the device is exceedingly effective due to the following fact from Maurice Cusson of the International Center for Comparative Criminology, “As soon as the alarm is heard, 68% of holdup men run away empty handed.” The site goes on to assert that “Alarms are proven deterrents, based on numerous academic case studies.”

ROBOCOPP extolls its own virtues, outlining the ways in which the Sound Grenade is superior to other “types of personal safety.” Reasons why the Sound Grenade is superior include a “standalone device with battery system” that does not require a cell phone; an ability to function without reliance on cell phone

¹² <https://itunes.apple.com/us/app/hollaback!/id379866261?mt=8>

network coverage; “does not rely on GPS signal”; and finally, the focus of the app is on prevention rather than response.

The site claims that “campus police love [the Sound Grenade],” going so far as to include quotes from universities. One quote, from the University of Washington, is positioned as a quote from campus police and states the following, “The Sound Grenade is a portable, extremely durable, and nonviolent solution, which makes it appealing to most college students.” However, further research shows that this quote comes from an article written in the Daily UW and has been abbreviated on the ROBOCOPP website. The full quote is as follows, “The Sound Grenade is a portable, extremely durable, and nonviolent solution, which makes it appealing to most college students. But some students prefer to use a device they already own to improve their safety: a phone.”¹³

Press:

There is very little readily available press on the ROBOCOPP, aside from the articles the site directs users to. As noted previously, the site seems to be biased in its marketing, which does not inspire confidence that the site is capable of being impartial.

Product Reviews

The app has a 5/5 star rating on Amazon, based on a total of seven reviews.¹⁴

7. TapShield

Overview:

TapShield is a student-centric safety tool that allows users to report crimes and suspicious behavior, viewable to all members of the community. Not only can users share tips about “potential threats” with the police and other users, they can also attach photos and videos. Reports can be submitted anonymously. Like many other safety applications, TapShield allows users to share their location with contacts so that friends and family can ensure that the user arrived home safely. TapShield also enables users to make GPS-tagged calls to 9-1-1 or campus safety officials. The app includes a “yank” feature, which sends an alert whenever a user’s headphones are forcibly removed from their phone.

Marketing Material:

¹³ http://www.dailyuw.com/news/article_a3ead2d8-e67f-11e5-8202-3f7e8816d451.html

¹⁴ <http://uedata.amazon.com/ROBOCOPP-Grenade-Personal-Alarm/dp/B010U2XD60>

TapShield describes their product as providing users with a “personalized social safety network” that enables users to “easily send critical information to public safety” in an effort to prevent crimes “before they happen.” The site states that the app is “top-of-mind,” although it is unclear what exactly this descriptor is supposed to mean. The site also describes their product as being comprised of an “active community” from which users can review “real-time crime info.” However, the level of engagement with the app is a bit dubious based on a survey of the app and how it is currently being used in the University District (which is to say, it does not appear to be used).

Press:

The most salient insights from news media regarding TapShield are as follows:

- TapShield claims that users will receive help from “emergency responders” (most likely campus police and security), up to 47 percent faster than calling 911 or using an emergency blue-light tower’s phone. The validity of the claim is not clear.
- The app is described as being like “Waze for personal safety,” suggesting that app helps inform users’ walking paths by publishing a map of local crime data.
- The service is offered both within and outside college campuses, although it’s function differs slightly depending on where the service is used. If the app is used within the bounds of a university, users can submit crime tips that other students and campus authorities can view; students can also summon help from campus security. If an individual is using the app outside the context of a college campus, crime tips are still readily viewable but pressing the alert button simply dials 911.
- TapShield CEO, Jordan Johnson, had the following to say about the app’s usage and market positioning, “What we’re hearing from students on the colleges and universities we target is this is the app economy, this is all about adoption – there are some really good apps out there, but they are not being adopted by their intended audience. This is what we’ve capitalized on. We resonate with the college demographic. Clean, uncluttered, map-based... This has been designed from the ground up with direct input from these guys.”

Relevant Articles:

- <http://thenextweb.com/apps/2014/05/29/waze-personal-safety-tapshield-takes-emergency-reporting-app-beyond-campuses-us/#gref>

Product Reviews:

TapShield has an average score of 4.1/5 stars on the Google Play Store, based on a total of 20 reviews.¹⁵

The current version of the TapShield application has an average score of 5/5 stars, based on 5 ratings. All versions of the app have an average rating of 4/5 stars, based on 19 reviews.¹⁶

B. Subject Matter Expert Interviews (*to-date*)

Daniela Rosner

Assistant Professor, HCDE, University of Washington

April 26, 2015, 12:30pm

Daniela is an assistant professor in Human Centered Design and Engineering (HCDE) and the co-director of the Tactile and Tactile Lab (TAT Lab) here at the University of Washington. Her research focuses on using design and technology for social change. Daniela has two research projects that are particularly relevant to our Safe Walking project: Trace and TraceloT. Trace is mobile application that allows people to make digital sketches (for themselves or to send to others) on their iPhone that are then converted into walking routes on a map. As described in Rosner's "Walking by Drawing" CHI paper, the purpose of the Trace study was to explore what Rosner refers to as "guided wandering" over destination or routine based navigation. The Trace study resulted in findings that are relevant to our Safe Walking project in a number of important ways: (1) some participants reported feeling unsafe or uncomfortable walking in certain areas or on certain streets, (2) the study was conducted in three major cities (Boston, Chicago, Seattle) and differences in fear and avoidance emerged across those cities, and (3) two participants felt walking could be a mechanism for social change, capturing what urban theorists refer to as "spatial justice." These are all interest to us as we are trying to figure out how to make women feel and be safer, thereby empowering them to walk in spaces that society has told them they don't belong in. Additionally, the data from this study started to surface commonly avoided areas based on when participants chose to deviate from the route suggested by Trace. Rosner related this potential use of data to the controversy of mapping crime data and quoted and discussed Rebecca Solnit, an activist that asserted that maps often "reflect the maker's priorities more than those of the culture(s) they depict." At this stage in our research, we are very interested in the social impact of mapping and how data can be portrayed in a way that either increases or decreases stigmatization and discrimination. Based on the TAT Lab's website, the TraceloT (Internet of Things) was a project that explored creative ways of engaging with and mapping "underutilized spaces

¹⁵ https://play.google.com/store/apps/details?id=com.tapshield.android&hl=en_GB

¹⁶ <https://itunes.apple.com/us/app/tapshield-personal-safety/id665176309?mt=8>

spaces such as dark stairwells.” While there is not much information about this online, it seems like it could be pertinent to features of the built environment being uncomfortable to be in and could be worthwhile to learn more about. In addition to those studies, Daniela seems like a great person to talk to because she has experience researching and establishing feminist hackerspaces, which likely means that she is interested in and familiar with creating safe spaces for women, and a great person to walk to for the Safe Walking team.

Interview Protocol

Hi Daniela, thanks again for meeting with us.

First of all I was wondering if it would be okay if I record the audio from our conversation today. This would be helpful for us to go back and fill in the gaps in our notes later. I also have a consent form for you, that protects your rights in this interview. It just says that I am recording you for our research purposes. We may want to quote you in a presentation, or possibly in our portfolios down the line, so I've also included a media release here. If we plan on using anything public we're happy to run that by you if you would like us to, in which case you can just check this box here. Additionally the only people who will have a copy of the recording are the members of my team.

I also want to be cognizant of your time, so right now it's _____, can we stay until _____? Ok, we'll keep track of that time.

So as you know, we are students in the MHCID program. I'm not sure how familiar you are with the capstone project process in the MHCID program, but basically, we start conducting research in this quarter and then work on ideation, prototyping, and evaluation over the summer. So we just completed a round of secondary research and are now interviewing subject matter experts, like yourself, and then will move on to some actual user research. The goal of our project is to research and design something that helps women feel safer when walking alone.

So our main interest right now is in what makes women feel afraid while walking and how we might change their walking experience in a way that empowers them to walk more, but without compromising their safety in the process. We're wanting to talk to you because you have some expertise in changing the way people engage with their environments and conceptualize walking with your Trace App and Trace Internet of Things projects and also because of your work in creating feminist hackerspaces.

Do you have any questions for us before I begin?

I do have some questions prepared, but there's no need to limit your responses to the questions specifically. If at any time, anything that may be relevant to our project pops into your mind, please share!

The first few questions I have down here are about the Trace app.

Interview Questions

1. While using Trace, participants were sometimes prompted to walk down streets they hadn't before. Did you learn anything from your participants about why in daily life they hadn't explored those areas before?
 - a. Do you think safety factors into this decision?
 - b. In your CHI paper, you mentioned that sometimes people did not like the routes that Trace prompted them to explore? Can you expand on this?
 - c. Did *all* participants report feeling unsafe or uncomfortable visiting unfamiliar places?
 - i. Why do you think some participants felt unsafe while others did not?
 - ii. Were the participants who avoided certain routes walking in less safe areas?
 - d. Did the participants who did report avoiding certain areas feel that they were engaging in discriminatory behavior?
 - e. By seeing when people deviate from the route suggested by Trace, you can start to understand which areas people avoid. Do you think this data could be useful?
 - f. In your paper, you discussed how the Stamen Design Crimespotting maps are controversial because while they intend to promote civic transparency, they may reinforce social stigma.
 - i. What is civic transparency? Is it possible for map-based visualizations be used to provide civic transparency without stigmatization?
 - ii. In what ways do visual representations increase social stigmas?
 - g. Why do you think participants in Boston deviated from routes more frequently than participants in Seattle?
 1. How did participants decide or know that a route was unsafe?
 - a. Visual cues or common knowledge?
 - h. Your paper also mentioned this concept of "Spatial Justice", and how one of the participants reflected on walking as being an opportunity for social change: a responsibility to leave the world better than how she found it. Can you elaborate on what Spatial Justice is?
 - i. How might awareness of Spatial Justice influence people's walking behaviors?
 - i. You shared a quote by Rebecca Solnit, an activist in SF about how maps often "reflect the maker's priorities more than those of the culture(s) they depict." What are some examples of maps reflecting the maker's priorities or reflecting the cultures they depict?
 - i. Do you think this is evident in the maps we all have on our phones and if so, who's priorities are the maps serving?

2. Are there ways other than maps to symbolize space?
 - a. What things need to be mapped and why?

The next few questions I have are about your Trace Internet of Things project.

3. On the online blog for this project, it seems like there were multiple explorations by various students. Was this project part of a course?
 - a. On the project description online, it stated that the purpose of this project was using light to explore engagement in underutilized public spaces such as dark stairwells. Why are these spaces important to explore?
 - i. What are some of the ways you explored with light?
 - ii. Did this project involve conducting studies with participants?
 1. Did your research expose anything interesting relating to how safe people feel in the space?
 2. In some of our secondary research, we read that there are certain physical environmental features and features of the built environment that may corresponded with people feeling less safe, such as dark alleys. In *this* project, did you find that there were certain physical features that made people feel less safe?
 - a. Are there ways to make these spaces feel more safe?

— — — RESEARCH METHODS QUESTIONS — — —

(Between her Trace study and Feminist Hackerspace study, she has experience researching both walking experience and spaces that empower women, meaning she could provide good insight as to what research methods we should use)

4. We also wanted to run some of our potential research plans by you to see if you had any feedback.
 - a. We are currently planning on doing a field research study with UW students, where we walk with women as they head home from class at night, and we talk to them and ask them questions about their experience and perception of walking alone on their route. What do you think about this method?
 - b. We were thinking of conducting a diary study where we have participants reflect on their walking experience. For this we would ask them to take notes of thoughts and habits before, during, and after a walk, and then also to take some photos of where they are walking to provide some environmental context.
 - i. It has been brought up to us that having participants use their phone to take pictures while they walk could compromise their safety, and so we might remove

this part. Any suggestions on how to fill in that gap?

- ii. We've also been lightly cautioned against using a diary study at all because it's somewhat longitudinal and we are on a condensed timeline.
 1. Any other methods that could get at something similar?
 2. In what ways was your diary study with Trace successful and unsuccessful?
- c. We will conduct a semi-structured interview with the same women from the diary study, and use these diaries as a tool for them to discuss their experiences walking alone. What do you think about this?
- d. Are there any other methods you think would be useful in general?

We also have a few questions about the research methods that you used in Trace, as they could be relevant to our methods.

5. Why did you decide to recruit dyads?
6. If you were going to conduct the Trace study again, what would you do differently?
 - a. What do you think worked well?

— — — IF THERE IS EXTRA TIME — — —

1. Some participants reported feeling a loss of control or autonomy when walking due to what you called “doubling-back” directions that the algorithm produced in order to make the drawings smoother. Were there any other reasons participants reported loss of control?
2. Other than dog-walkers, did any participants report regularly exploring new areas before using Trace?
3. Did you do any follow up studies with any participants after the study described in your CHI paper? After experiencing Trace, did participants report thinking about or interacting with the area around them differently in general? Did any participants report wandering and exploring new areas more frequently after this experience?
4. For Trace, you recruited participants from 3 different cities. Why did you feel it was important to study participants that are diverse in this way?
 - a. Is this something you think is crucial for our project as well?
5. What initially sparked your interest in Trace and this concept of “guided wandering?”

— — — ENDING THE INTERVIEW — — —

Thank you again for your time, this information will be helpful for our project. If we have any follow-up questions, would it be alright if we email you? Is there a better way to contact you in the future?

Gillian Wickwire

Threat Manager, Safe Campus, University of Washington

April 26, 2015, 2:00pm

Gillian Wickwire is a Threat Manager for the Safe Campus program, the central reporting and coordination office for threat management and violence prevention at the University of Washington.

In addition to organizing workshops across campus, Gillian also runs a 24 hour hotline and a public awareness campaign (posters, website, presentations) to educate the university population on concerning behaviors as well as when to notify Safe Campus.

With several degrees in Women's Studies (BA, MA and PhD) and previous experience in conflict resolution, rape crisis and dating violence counseling, she can speak to how people (especially women) deal with fear, as well as specific issues of concern for the UW population. She's not exactly the right contact for stranger violence while walking but was able to speak on extreme cases of fear, safety planning, as well as her overall understanding of systemic issues that threaten women's safety and self-determination.

The interview was conducted at Gillian's office at the Roosevelt Commons building (4300 Roosevelt Ave NE) and is in the process of being summarized for my report which I will turn in on Friday. Though the questions below changed a little in the course of the conversation, most of the main issues were covered.

Interview Protocol

Hi Gillian, thanks again for meeting with us.

First of all I was wondering if it would be okay if I record the audio from our conversation today. This would be helpful for us to go back and fill in the gaps in our notes later. I also have a consent form for you, that protects your rights in this interview. It just says that I am recording you for our research purposes, and nothing from it will be used without your further consent in any public publication. We may want to quote you in a presentation, or possibly in our portfolios down the line, but we're happy to run that by you if you would like us to. Additionally the only people who will have a copy of the recording are the members of my team.

I also want to be cognizant of your time, so right now it's _____, can we stay until _____? Ok, we'll keep track of that time.

So a little background on our capstone project. We're Human-Computer Interaction and Design masters students. Our department is an interdisciplinary one that bridges Computer Science, Human-Centered

Design and Engineering, the iSchool, and the Division of Design at the School of Art. We're halfway through the program and in the research phase of our Capstone Project, a project we will be working on from now until we graduate in August. The goal of our project is to research and design something that helps women feel safer when walking alone.

So part of our interest is in what makes women feel afraid to begin with and we're wanting to talk to you because you have some expertise about the types of issues people experience on campus that could contribute to these feelings of not being safe.

I do have some questions prepared, but there's no need to limit your responses to the questions specifically. If at any time, anything that may be relevant to our project pops into your mind, please share!

Do you have any questions for us before I begin?

Interview Questions

1. What are the most common violent situations that your program deals with or fields on the telephone line (206-685-SAFE)?
2. What is the breakdown between male and female victims? Do they face different violent threats and situations?
3. What makes women at UW susceptible to violence of any kind? Are certain groups are at a higher risk on campus?
4. Do different demographics tend to correspond more with certain types of violence? (e.g., mugging vs sexual attack)
5. How safe do you feel the campus is from stranger violence?
6. Are there any campuses that you know to be safer? Why?
7. Thinking back about some of the women you've helped and their experience of violence or fear of violence. How does that fear manifest in their daily life?
8. How does that fear manifest in their relationship to their surroundings?
9. Do you ever deal with women who are afraid and need to traverse campus?
10. What kinds of things, spaces, or environments in and around campus are they afraid of?
11. For the women or people who are afraid, how do they negotiate that fear?
12. Do they take specific routes or walk with a friend?
13. Do they use any service?
14. Which ones and how well do they work?
15. In your work or research do you see any recent patterns or trends in the realm of women's safety, awareness, or protection of themselves?

16. What types of strategies or techniques have you found that people are using to feel safer when they are afraid on the street?
17. Are there any technological solutions or other non tech tools you have heard of?
 - a. Do you recommend any?
18. What do you think about mapping violence from crime data?
19. Do you think crime data is a credible source of information vs social media posts?
20. Do you think crime data is an accurate measure of real risk?
21. How do women hear about or share information about safety, incidents, threats?
 - a. Share on social media? UW Alerts?

— — — GENERAL QUESTIONS — — —

Do you come across the issue of women experiencing violence when walking?

Generally can you tell me your thoughts on things that make women the least safe? What makes men the least safe? And what would make them safer?

What makes women the most safe when walking alone?

What are your thoughts about how women might compensate for feeling unsafe or mitigate their feelings?

What is the most common problem you face in your job?

— — — ENDING THE INTERVIEW — — —

Thank you again for your time, this information will be helpful for our project. If we have any follow-up questions, would it be alright if we email you? Is there a better way to contact you in the future?

Natalie Dolci

Victim Advocate at UWPD

Thursday, April 28 - 10:30 am

The Victim Advocate program assists students, faculty, and staff experiencing a variety of safety concerns including dating violence, sexual assault, and stalking; and helps victims and their families through the process of physical, emotional, and financial recovery, including planning for their future safety.

Natalie has worked as a Victim Advocate for 4 years, and she also is a board member for the Coalition Ending Gender Based Violence.

Interview Protocol

Hi Natalie, thanks again for meeting with us.

First of all I was wondering if it would be okay if I record the audio from our conversation today. This would be helpful for us to go back and fill in the gaps in our notes later. I also have a consent form for you, that protects your rights in this interview. It just says that I am recording you for our research purposes, and nothing from it will be used without your further consent in any public publication. We may want to quote you in a presentation, or possibly in our portfolios down the line, but we're happy to run that by you if you would like us to. Additionally the only people who will have a copy of the recording are the members of my team.

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So part of our interest is in what makes women feel afraid to begin with and we're wanting to talk to you because you have some expertise about the types of issues people experience on campus that could contribute to these feelings of not being safe.

I do have some questions prepared, but there's no need to limit your responses to the questions specifically. If at any time, anything that may be relevant to our project pops into your mind, please share!

Do you have any questions for us before I begin?

Interview Questions

1. What are the most common violent situations that you deal with?
2. What is the breakdown between male and female victims? Do they face different violent threats and situations?
3. What makes women at UW susceptible to violence of any kind? Are certain groups are at a higher risk on campus?
4. Do different behaviors (or demographics) tend to correspond more with certain types of violence? (e.g., mugging vs. sexual attack)
5. How safe do you feel the campus is from stranger violence?
 - a. Are there any campuses that you know to be safer? Why?
6. Thinking back about some of the women you've helped and their experience of violence or fear of violence.
 - a. How does that fear manifest in their daily life?
 - b. How does that fear manifest in their relationship to their surroundings?
7. Do you ever deal with women who are afraid and need to traverse campus?
 - a. What kinds of things, spaces, or environments in and around campus are they afraid of?
8. For the women or people who are afraid, how do they negotiate that fear?
 - a. Do they take specific routes, walk with a friend or they use any service?
 - b. Which ones and how well do they work?
9. In your work or research do you see any recent patterns or trends in the realm of women's safety, awareness, or protection of themselves?
10. What types of strategies or techniques have you found that people are using to feel safer when they are afraid on the street?
11. What are some of the technological solutions you have heard of?
 - a. Do you recommend any?
12. What do you think about mapping violence from crime data?
13. Do you think crime data is a credible source of information vs social media posts?
14. Do you think crime data is an accurate measure of real risk?
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— — — GENERAL QUESTIONS — — —

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Generally can you tell me your thoughts on things that make women the least safe? What makes men the least safe? And what would make them safer?

What makes women the most safe when walking alone.

What are your thoughts about how women might compensate for feeling unsafe or mitigate their feelings?

What is the most common problem you face in your job?

— — — ENDING THE INTERVIEW — — —

Thank you again for your time, this information will be helpful for our project. If we have any follow-up questions, would it be alright if we email you? Is there a better way to contact you in the future?

Tari Nelson-Zagar

Senior Program Manager, Seattle Neighborhood Group

Thursday, April 28 - 3:00 pm

Our secondary research suggests that physical features of the built environment play a significant role in affecting women's perceived safety. Going forward, however, we're interested in gaining a better understanding of how the built environment impacts actual safety. This led me to contact the Seattle Neighborhood Group because of the work they do regarding crime prevention through environmental design (CPTED). This organization "offers CPTED services citywide, with an emphasis on the Central Area, Southeast Seattle, West Seattle, and White Center. SNG Staff will make a site visit, take photographs, collect anecdotal information from property users, and generate an illustrated CPTED report for the site." The Seattle Neighborhood Group's Senior Program Manager, Tari Nelson-Zagar, responded to my request for an interview and agreed to meet with us on Thursday, April 28th at 3pm in Room 310 of the Engineering Annex. In addition to elaborating on the practices surrounding CPTED and its efficacy, we are hoping we may get a better sense of what causes a neighborhood to gain a bad reputation, that is, try to understand what factors lead to social stigmatization of an area. If Tari consents to being recorded, we plan on using a voice recorder we rented from UW's STF Equipment Loan Program to capture audio from the meeting.

Interview Protocol

Hi _____, thanks again for meeting with us.

First of all I was wondering if it would be okay if I record the audio from our conversation today. This would be helpful for us to go back and fill in the gaps in our notes later. I also have a consent form for you, that protects your rights in this interview. It just says that I am recording you for our research purposes. We may want to quote you in a presentation, or possibly in our portfolios down the line, so I've also included a media release here. If we plan on using anything public we're happy to run that by you if you would like us to, in which case you can just check this box here. Additionally the only people who will have a copy of the recording are the members of my team.

I also want to be cognizant of your time, so right now it's _____, can we stay until _____? Ok, we'll keep track of that time.

So as you know, we are students in the MHCID program. I'm not sure how familiar you are with the capstone project process in the MHCID program, but basically, we start conducting research in this quarter and then work on ideation, prototyping, and evaluation over the summer. So we just completed a round of secondary research and are now interviewing subject matter experts, like yourself, and then will move on to some actual user research. The goal of our project is to research and design something that helps women feel safer when walking alone.

So our main interest right now is in what makes women feel afraid while walking and how we might change their walking experience in a way that empowers them to walk more, but without compromising their safety

in the process. We're wanting to talk to you because of your involvement in Seattle Neighborhood Group and your background in Information Sciences.

Do you have any questions for us before I begin?

I do have some questions prepared, but there's no need to limit your responses to the questions specifically. If at any time, anything that may be relevant to our project pops into your mind, please share!

Interview Questions

1. We're interested in learning more about the CPTED services that the Seattle Neighborhood Group provides. Can you tell me about a recent instance in which your group visited a site?
 - a. What did you take photographs of? (Or) What do you usually take photos of? Why?
 - b. Who commissioned these CPTED assessments?
 - c. What kind of anecdotal information do you typically gather when conducting these assessments?
 - i. How does this anecdotal information differ between the Central Area and West Seattle?
 - ii. How do residents of the Central Area describe the region? How do residents of West Seattle describe the area?
 - d. What does a typical CPTED report consist of?
 - i. Can you provide an example of information contained in a CPTED report from West Seattle or the Central Area?
2. What makes an area feel safe?
 - a. What makes an area feel unsafe?
 - b. Are there features of the built environment that only feel unsafe at night?
 - c. Are there any features of the built environment that cause women, in particular, to feel unsafe?
3. In your experience, what CPTED practices are most effective at reducing crime?
 - a. Are there certain types of crime that CPTED practices are particularly good at combating? If so, why?
4. Have assessments been conducted because women reported that they were afraid of walking alone at night in a particular neighborhood?

- a. What kinds of things, space, or environments are these individuals afraid of?
 - b. What actions can neighborhoods take to combat these feelings of unsafety?
 - c. What prevents these CPTED practices (that reduce fear of crime at night) from being implemented?
5. Do built environment features affect people's walking behaviors? If so, how?
- a. Do people tend to avoid areas with certain environmental features, or intentionally try to walk with areas with other environmental features?
 - b. How do CPTED interventions change these behaviors?

ADDITIONAL QUESTIONS IF THERE IS REMAINING TIME

6. Compared to other large U.S. cities, it is found that Seattle has high rates of walking and bicycling to work. What are the effects of increased walking and biking rates on safety?
7. Are there any CPTED practices specifically intended to encourage neighborhood residents to walk around more? If so, why?
8. What typically causes an environment to gain a reputation for being unsafe?
 - a. Do you think physical features of an area, such as broken windows or graffiti contribute to an area having unsafe reputation? What other features contribute to this reputation?
 - b. What about crime maps? Do you think heat maps depicting crime contribute to reputations people have about areas?
 - c. Is it word of mouth or common knowledge that certain areas are unsafe?

— — — ENDING THE INTERVIEW — — —

Thank you again for your time, this information will be helpful for our project. If we have any follow-up questions, would it be alright if we email you? Is there a better way to contact you in the future?

C. Phone Screener for All Studies

Introduction

Hi _____,

This is Julie and Sara from the Safe Walking Capstone Team...

How are you doing? Is this a good time to talk? Do you have 5 minutes?

I think my colleague Kiyana explained a little about what we're doing, but just to reiterate. We are in the research phase of our capstone design project and we're designing a way to help women to feel safer when walking alone. To that end we want to try to understand the experiences of a range of women who walk alone at night. We're also being sponsored by REI so we hope to make something really cool even though we don't know what it is yet!

So your role would be two fold.

First, we need people to track their nighttime solo walking over the next week. We are asking people to download an app called Strava and actually record their walking and perhaps take a photo or two.

We are hoping to meet up with participants on Friday and have them begin this weekend.

Secondly, At the end of next week we need to spend an hour talking to participants about what they experienced.

First of all, does that schedule work for you? I realize it's pretty fast... we realize we're taking up a little bit of your time and energy and we are happy to gift you \$40 in an amazon gift as a thank you for your time and thoughts.

If Yes, continue.

Questions:

So I just have a few questions because we're trying to make sure people are a good fit for our study...

1. Will you be walking alone at least 3x in the evening over the next week?
 - a. About how long do you expect these walks to take?
2. Have you participated in a research study before? When?
(I'm thinking this could be where they could show their interest)
3. What interests you about our study?
4. Are you currently a student at UW?
5. *If no*, Do you work? Where?
6. Are you new to Seattle?
7. *If a student*, what year?
8. *If yes*, what is your main method of transportation?
 - a. Walk (go to Q9)
 - b. Car (go to Q10)
 - c. Bus (go to Q11)

d. Other

e.

So the next questions are about your transportation habits just to make sure we get a mix of participants....

9. *When you walk at night*, how far is your average walk?
 - a. What neighborhood are you usually walking in at night? Dorms? Off Campus? Greater Seattle?
10. *If driving to work or school*, where do you usually park? How long does it usually take to walk there?
11. *If bus*, which bus stop do you usually take? How long does it usually take to walk there?
12. Given the tight time frame, and because we think it would be better if the interview was more conversational, we were considering interviewing participants in pairs. Would you be comfortable participating in the interview along with another participant?
13. Do you anticipate any problems tracking your nighttime walking activity next week? How many do you think that you'll be able to track.

Great, well you seem like a great participant.

Would you be able to meet up this Friday to receive your Strava account login and journal? We would also like to schedule your interview at that time?

What time are you available on Friday? we only need about 5 minutes of your time..

Ok Great, we will send you a confirmation email.

D. Semi-Structured Interview Protocol

Introduction

[greeting]

Thanks for meeting with us here today. My name is ____ and this is _____. We will both be conducting the interview today and are both on the Safe Walk team.

[background]

As you recall, we are part of the masters degree program in human computer interaction and design and we are working on a capstone project looking at ways to help women feel safer while walking alone.

[appreciation and value]

We are so appreciative of your time and want you to know that our project is made so much better by the small, seemingly insignificant experiences of your life. Through you and the other participants that share thoughts and feelings we hope to make something that actually addresses this experience. So you are our expert, nothing you say is wrong to us.

[consent]

Before we begin --- This was covered in your consent form, but I just wanted to remind you that you may ask us questions at any time and you are free to stop at any point without any loss in compensation. I also wanted to let you know that we will be asking you some questions that may find uncomfortable or unpleasant to answer --- if there is anything you don't feel comfortable answering, that's totally fine- just say "I'd rather not answer that."

[compensation]

Speaking of which, here is your \$40 in Amazon gift cards. Can you fill out this form here to confirm that you received payment. It's possible you may also be contacted by the university to confirm that you received it.

[agenda]

So for the first half of this interview, we will do a couple mapping activities and will discuss some of your walking experiences that took place during your diary study. Then, we will finish up by asking you questions about your walking experiences in general. We are aiming to be done by ____ and will be done by ____ at the absolute latest. Do you have any questions before we begin?

Warm Up / Lynch Map (5 minutes)

To start, we just want to quickly collect a little bit of background and draw a simple map. This is just a warmup to get you thinking about walking and also get a basic feel for your Seattle experience

On a blank sheet of paper

1. First can you indicate where you live and mark what you consider personally to be the major landmarks of your neighborhood.
2. Indicate areas you frequently visit or spend time at around here? *Give more paper if she needs to draw another area*
3. What are areas that are safe? What are areas that feel unsafe?
4. Can you indicate the most normal route here?

Activity I: Diary Entries (15 minutes)

Here are the routes and images you took over the past week. [spread printed out maps/images on table].

[Feedback on experience / warm up]

First, let's talk a little about your experience keeping a diary.

1. Was documenting your routes and experiences difficult or easy to do? Why?
 - a. Do you think you were more aware during your walk than you usually are?
 - b. What were you aware of? Yourself? Your surroundings?

[Questions about entries]

2. For each route - *have them notate if need be*
 - a. Tell me about this walk - where were you going and at what time of day?
 - b. Had you taken this route before? How frequently do you take this route? Does the route ever vary? Why?
 - i. Did you notice anything along your route during this activity that you hadn't noticed previously when taking the same route?
 - c. Did anything notable happen during this walk
 - d. Can you walk me through any photos or notes you took?
Did you observe or witness any *things or people* that make you feel safe or unsafe?
3. Are there other routes you frequently take that you didn't happen to take during this study?
 - a. If yes, can you draw these on this map. [pull out map that will be used in the next exercise]
4. Were there any routes you took during this study that were unfamiliar?
 - a. How did your experience differ from walking a more familiar route?
 - b. If not - still ask about how their experience in general differs when it's an unfamiliar place.
5. Did you pay attention to your body language or behavior on these walks? What did you notice?
6. Were you carrying any tools or weapons on any of these walks?
 - a. Which walks? What were you carrying? Where did you keep them during your walk?

Activity II: Blank Map (10 minutes)

I have one last map activity and then after that, we'll move into the interview.

Show them a map. Can you put a star on this map indicating where you live?

1. Can you circle in green all the areas you're pretty familiar with? Places you hang out either currently or in the past.
2. Can you circle areas that you don't go to, or wouldn't, and possibly note the reason too.
3. Do you ever walk to or from these areas?
 - a. What about at night?
 - b. Are there any streets or blocks you tend to avoid?

Now, I want you to use this red marker to circle any streets, blocks, or areas, that you feel unsafe walking alone in. Likewise, here is a green marker to circle areas that you feel safe walking in.

Once they are done circling:

1. What makes you feel safe/unsafe here? (for each circle)
2. How did you learn this area was unsafe? (for red circles)
 - a. Did you ever hear about anything happening to anyone else or experience anything first hand that led you to believe this was an unsafe area?

Interview (60 - 90 minutes):

For the rest of this session, I am just going to ask you questions about your thoughts and experiences about walking in general. I just wanted to reiterate once again that if there's any question you feel uncomfortable answering, we can skip it.

Personal Experiences

First, let's talk about your experience walking alone.

1. First, I want you to think about what circumstances you feel afraid to walk alone in? Go ahead and list out on this sheet of paper, all of the circumstances that makes walking alone feel unsafe.
 - a. Is there anything you tend to do to make you feel safer when you walk alone in these circumstances?
 - b. What would you need to feel totally safe to walk alone in those circumstances?
 - c. What specifically are you afraid of happening? Are you afraid of mugging?
2. When did you start worrying about walking home?
 - a. Did your parents or teachers ever teach or warn you for about anything about walking alone?
 - b. What about the media? Do you think you learned anything from the TV, internet, or radio about walking alone?
3. Conversely, in what circumstances are you *not* worried about walking alone?
4. Is walking in Seattle different than walking in other places?
5. Do you only feel unsafe when you are walking alone? What about when you are walking with other people?

Friends & Family Experience

1. Does your family have any opinions about you walking alone?
 - a. Friends - do they have any opinions about you walking alone?
 - b. Roommates?
 - c. Men in your life?
2. Do you have an opinions about your friends or family walking alone?
3. Do you and your friends take any precautions when you know each other will be walking alone?
4. Do you ever call or text anyone to let them know in advance that you'll be walking alone?
 - a. Do you ever talk on the phone with anyone when you're walking alone?
 - b. Do you let them know your location?
 - c. Why does this make you feel safer?
 - d. Do any of your friends or family do this with you? How do you feel about them doing that?

Bystander Experience

1. Do you feel more or less safe walking when there are other people around? (strangers)

Personal Tools + Behaviors

1. Can you describe a time when you were walking alone and you felt you were at risk of something happening?
 - a. What did you do?
 - b. What was your strategy?
 - i. Did you notice any escape routes?
 - c. Did you feel prepared?
 - d. Did you have any tools or weapons on you?
 - e. Did this experience influence your future walking behavior or anything else?
 - i. If this same exact thing were to happen again, would you feel more prepared now?
2. After this experience, or any others experience where you felt at risk, did you tell anyone about it?
 - a. What did you say
 - b. How did they react?
3. What do you think prevented you from talking about your fears to others?
 - a. Do you feel comfortable expressing your experiences or fears to other women?
 - b. What about men?
4. What do you usually carry with you while you're walking? (Make sure they touch on each item below and clarify where they keep it with them on their walk. Does it stay in the same place the whole time - when they leave, along the way, and are arriving at their destination).
 - a. What about your phone? keys?
 - b. What about your wallet?
 - c. What about weapons? Do you carry anything to help you physically defend yourself?
5. Now, I want you to imagine that you are walking alone at night, and you suspected someone was following you or a threat to you in some way.
 - a. What would you do?
 - b. How would you determine they are a threat?
6. If you were physically confronted, how do you think you would defend yourself?
 - a. Do you have an formal self defense training?
 - i. Do you feel better prepared because of it?

- b. Do you have any defensible behaviors that you use to make yourself feeler when walking?
For example, some people may let a roommate know they are walking home late, others carry their keys in their hands at all times.
- 7. Are you aware of any tools you can carry or phone apps that are supposed to make people safer when walking alone?
 - a. For each thing they list:
 - i. Do you currently use it?
 - ii. Have you ever used it?
 - iii. How do you know about it?
 - iv. In what way could it be useful?
 - v. Why is not useful?

UW Tools

Now, let's discuss some of the services that UW provides.

1. Have you ever heard of Husky NightWalk?
 - a. Have you ever used it?
 - b. If they haven't heard of it: Husky Nightwalk is a service where on campus, and in campus parking garages, you can have security escort you to your destination.
 - i. Now that you know what it is, can you imagine using this?
 - ii. When or in what ways would it be useful?
 - iii. When or in what ways wouldn't it be useful?
2. Have you ever heard of Husky NightRide?
 - a. Have you ever used it?
 - b. If they haven't heard of it: Husky NightRide is a free service that shuttles UW students on and around campus at night.
 - i. Now that you know what it is, can you imagine using this?
 - ii. When or in what ways would it be useful?
 - iii. When or in what ways wouldn't it be useful?
3. Have you noticed the Blue Tower Emergency Phones on campus?
 - a. Have you ever used them?
 - b. Can you think of where any are located on campus?
 - c. Would you ever use them?
4. Do you receive UW Safety Alerts?
 - a. Do you read these?
 - b. What types of reports are covered by UW Safety Alerts?
 - i. What is not covered?
 - c. What are your thoughts on UW alerts?
 - d. Does receiving those alerts make you feel more or less safe?
 - e. Have you noticed any trends in the alerts?

Wrapping Up

Before we wrap up, I have just a few more questions.

1. If you could dream up a tool that would make you feel safe when walking alone, what would it be?
 - a. What kinds of features would it have?
2. Is the problem of being and feeling safe while walking a problem that you think can possibly be solved?

(Or break it down into two questions:)

 - a. Do you think you will ever feel totally safe when walking alone?
 - b. Do you think you will ever be totally safe when walking alone?
3. **(only if there is time)** Lastly, I want to list off some features of existing products. I'd like to hear your thoughts on them, such as have you heard of them, would you use them, do you think they would be practical to use in the moment?
 - a. Features: Contacting friends or family when you feel unsafe; allowing friends and family to monitor your whereabouts (so that they know when you've gotten home safe); contacting local authorities when you feel unsafe; app based solutions versus physical devices; crime data or crowdsourced data to help you determine safe and unsafe areas

Debrief

Thank you so much for participating with us here today. We appreciate you being so open with us and willing to share on this sensitive topic. Our goal is to take these very real experiences that people have and to find patterns in them and create something that will actually help people.

Timeline: In a few weeks, we will conclude the preliminary research we are conducting and will then start brainstorming and prototyping possible solutions, which we will then do another round of research to test out. Our project is set to conclude when we graduate in August, though it's possible it could continue on depending on where we end up.

If you want to follow the progress of this project, you can follow our Facebook page. We are also thinking of making a blog to document our process and if we do so, we will advertise it on our Facebook page. I'll email you a link to your Facebook page. Additionally, I link you to some more information on the safety services UW currently provides, though this is not necessarily an endorsement for those services.

E. Field Research Protocol

Introduction

Set up (before leaving): Ok before you begin, I want to tell you a little bit about our project. We want to know the kinds of things you think about in terms of your own safety walking home. So I'm going to be asking you a few prompts but I just want you to be as thoughtful as possible about any patterns that you might have. Even if you don't think of things right away, anything that you subconsciously do, I'm trying to understand.

Questions

BEFORE

1. Is there anything you do to keep yourself safe/ feel safer?
 - a. Do you carry any weapons?
 - b. Does the knowledge that you'll be walking alone impact the way you dress?
 - i. Do you think the clothes you wear impact your ability to defend yourself
 - c. Does anyone know you're walking home right now?

DURING

2. Are we taking the route you typically take from this class?
3. Is this the same route you take during the day home from school?
4. Are there any blocks or streets that you avoid at night?
 - a. Do you also avoid them during the day?
5. Looking around, is there anything that makes you feel unsafe (ask this several times on the walk)
6. Where is your phone right now?
 - a. What about your keys?
 - b. What about your wallet?
7. When you're walking alone, what are you afraid of happening?
8. If you felt like you were at risk of that happening right now, what would you do to try and protect yourself?

AFTER

9. Can you think of a time you've experienced anything strange walking home?
10. When walking alone, do you avoid people or do you try to walk near other people on the street?
What makes this determination for you?
11. Is there anything else you'd like to add?

F. Coding Instructions

While listening to the audio of an interview, listen for whether the participant mentions something listed on the left column sheet. If so, write the time in the audio file that the participant mentions this. Also indicate whether the participant says they do or do not do that thing by writing "yes" or "no." For example, if the participant says they do carry mace at 2 minutes and 30 seconds in the audio, you would write "yes (2:33)" in the cell. If they say they do not carry mace, you would write "no (2:33)." If they reference something multiple times, separate the times with commas. For example, if they said they use mace at 2:33 and again at 10:01, you would write "Yes (2:33, 10:01)." If you aren't sure how to interpret what they said, put "IDK" instead of yes/no.

If you get to the end of the audio file and they never once mention anything about it, simply put a minus sign "-" in the cell.

If the participant mentions something that is not listed, add that thing to the list.

The only time a cell should be blank is because someone added a new category to the list after that participant was coded.

If the participant says something interesting, quote-worthy, or something a yes/no doesn't capture the depth of, quote what they said after listing the time. For example, in a cell, you might write: Yes (2:33) "Those alleys are filled with hidey holes"

If the participant tells an anecdote, add it to the anecdote sheet - note the time and either summarize it or transcribe it. If transcribing it, use quotation marks so we know.