Fear of Crime in Time and Place: Developing and Testing a New Momentary Social-Psychological Model of Victimisation Worry

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Statement of Overall Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Supervisor: Dr. Timothy C. Hart
Personal Acknowledgements

Happiness lies in the joy of achievement and the thrill of creative effort – Franklin D. Roosevelt

I did it! I know the usual way of doing acknowledgements is to start off by thanking this person and that person, but I have decided to let my creativity run a little free before I do that. I set out to undertake this mammoth exercise just over three years ago and I sit here looking at the current body of work amazed at what I have been able to achieve in such a short period of time. Despite finishing this thesis relatively close to my minimum submission date, my PhD journey was hardly an easy one. Just like every other doctoral scholar that has come before me, the challenges that I have faced doing my research at times were crippling and anxiety provoking. But, I have learned a lot about my profession, my discipline, and most importantly myself over the last three years. One of the main things that I have learned is to never doubt your abilities. Embrace and celebrate every achievement along the way (no matter how small they may be), because we have been afforded an incredible opportunity, that not everyone in this world gets the chance to achieve. To the future PhD students who read this work, do two things: (a) cite it (…I am joking, but if you want to I am not going to stop you); and (b) never lose sight of yourself and never give up; you can do anything.

I would not have been able to achieve this thesis without the support of some amazing people, whom I should probably acknowledge now, as I have spent the last few lines blabbering on about self-fulfilment and pushing through challenges to achieve your goals (maybe I will have a career in self-help after this). I would first like to acknowledge the support of my academic committee consisting of Dr. Timothy Hart, Professor Ross Coomber, and Associate Professor. Christine Bond. They were a great team, and I am grateful to have had the opportunity to work with them over the last three years on this project, and be guided by their wealth of knowledge and experience. I also would like to offer an extra shout out to Tim Hart, who I have had the pleasure of working with for the last 5 years. Your supervision and constant encouragement has gotten me to where I am today, and this thesis would not have been possible without you (Go Gators!).

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Finally, and by no means the least, I would like to acknowledge my family. Thank you to my mum, dad, grandmother, and sisters for their continual support during this whole academic journey (and those who are not here with me today, but have been pivotal to my success and growth over the years—my grandfather, in particular). I could not have achieved this without all of you.

I hope that whoever reads this work finds it insightful and thought provoking (…and not too long a read). I now present “Fear of Crime in Time and Place: Developing and Testing a New Momentary Model of Victimisation Worry” by Michael Chataway.
Abstract

Scholars have studied fear of crime for many years, with a number of predictors of crime fear identified. Despite the growing body of fear of crime literature, the measurements, methods, and theories currently used to examine fear of crime are in need of significant innovation. Specifically, scholars continue to rely on single item measures to gauge fear of crime, ignoring its multidimensionality. Moreover, existing methods used to capture fear of crime and risk have restricted researchers’ ability to examine its spatio-temporal features, thereby preventing the development of momentary models of fear of crime. The present dissertation reconceptualises the quantitative study of fear of crime by: (a) testing alternative measures of fear of crime; (b) introducing novel methods used to collect context-dependent information about fear of crime; and (c) developing new theoretical models of fear of crime.

To achieve these goals, three studies were conducted and included in the current dissertation by series of publications. The current research was guided by an overarching research question: How can we better understand fear of crime and perceived victimisation experiences in time and place using alternative measures of crime fear, innovative technologies, and momentary models of victimisation worry?

The first study (Chapter 2) evaluated alternative measures of fear of crime in the Australian context with a random sample of Gold Coast residents ($N = 713$). In this study, alternative measures and an established model of victimisation worry developed by Jackson (2005) were used to test fear of crime. According to this established model, fear of crime comprises five distinct dimensions of victimisation worry: frequency of worry, perceptions of the likelihood of victimisation risk, perceptions of the consequences of victimisation experience, perceived levels of control over victimisation and beliefs about the prevalence of crime. These five distinct dimensions are shaped by individuals’ perceptions of the physical and social environment. Data collected from residents indicated that these alternative
measures of victimisation worry had acceptable scaling properties, supporting their cross-cultural validity. Provided with the knowledge that these measures were valid and reliable in the Australian context, the next step of this research was to examine what new knowledge could be produced from the victimisation worry model. Specifically, data from Study 1 were assessed in Chapters 3 and 4 to show how the model could be used to provide new insights into current issues related to fear of crime. Moreover, results presented in these chapters indicated that the model of victimisation worry could be used to explain individual differences in fear of crime when considering awareness of community crime prevention programs underway in a neighbourhood (Chapter 3) and gender (Chapter 4). Collectively, results from the first study suggest that alternative measures of victimisation worry capture the complex affective and cognitive components of fear of crime and can be used to explain individual-level variability in fear of crime. Because this model was deemed reliable and could be used to understand reactions to crime and disorder, the remaining studies of this dissertation focused on how researchers could advance the victimisation worry model by (a) collecting more ecologically valid data about fear of crime experienced in the proximate environment; and (b) extending the original model to a more process orientated momentary model that considers place, time, and psychological state.

The second study (Chapter 5) expanded the alternative measures of fear of crime replicated in Study 1 by exploring whether mobile technology could be leveraged to collect meaningful data about context-dependent fear of crime. In this study, a new set of data was collected from college students \((N = 20)\) living on the Gold Coast of Queensland, Australia, using their mobile devices. Results of the pilot study showed that measures of victimisation worry were reliable when administered via smartphones. Moreover, hypothesised connections between these measures were supported and in the implied directions. Provided with the knowledge that more ecologically valid information about the various dimensions of
fear of crime could be derived from mobile technology, the final study of this dissertation introduced and tested a new momentary model of victimisation worry that was guided by the original process model tested in Chapters 2 through 5.

The final study (Chapter 6) enhanced the knowledge informed by Studies 1 and 2, by developing the new momentary model of victimisation worry. In addition to momentary measures of victimisation worry, questions about momentary psychological state were included in the model and their influence on individuals’ perceptions of the physical and social environment were examined. A new set of data was collected and analysed from mobile initiated ecological momentary assessments ($N = 499$) from young adults living in Southeast Queensland, Australia. Results presented in Chapter 6 suggested that the new momentary model of victimisation worry could explain key relationships between theoretical predictors of fear of crime. For example, momentary worry about crime was shaped by perceptions of immediate risk, perceptions of disorder and lack of community cohesion, and negative affectivity.

Collectively, the three studies presented in this dissertation by series of publications make a significant contribution to our existing empirical and theoretical knowledge by advancing the measurement, methods, and theories/models used to currently examine fear of crime. Each study builds off the previous, with new measurement, methodological, and theoretical insights into fear of crime introduced in each chapter. The dissertation concludes with a discussion and synthesis of the overall research findings, limitations of the research, and implications for future fear of crime research in Chapter 7.
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CHAPTER 1: INTRODUCTION

1.1 Fear of Crime: Why Do We Study It

Fear of crime has been of interest to scholars for more than fifty years. The current body of work that informs our understanding of fear of crime has identified a number of important predictors of crime fear\(^3\), including personal, situational, and social vulnerability (Killias, 1990; Warr, 1990), perceived victimisation risk (LaGrange, Ferraro, & Supancic, 1992; Jackson, 2005), incivilities (Brunton-Smith & Sturgis, 2011), and social cohesion (or a lack thereof) (Sargeant et al., 2017). Moreover, scholars’ interest in fear of crime has been driven by the consequences it is believed to produce for individuals (i.e., a poorer quality of life) and society (i.e., reduced social ties)\(^4\). Despite crime being a relatively rare event, people continue to be fearful of it, with a substantial literature showing that individuals overestimate their risk of criminal victimisation when their actual risk posed by crime is quite low (Box, Hale, & Andrews, 1988; Killias, 1990; Killias & Clerici, 2000; Lee & Mythen, 2017; Perloff, 1983). It is for these reasons that scholars have called for more location-specific fear of crime research in order to unearth what fear of crime may be a response to within the physical and social environment (Fisher & Nasar, 1995). By doing so, it is hoped that researchers can develop more effective strategies to reduce the prevalence of fear of crime within the community.

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\(^3\) “Fear of crime” and “crime fear” are referred to interchangeably throughout the dissertation. This choice of word phrasing has been adopted in many contemporary works on fear of crime (Hart, 2016; Jackson, 2005; Lee & Mythen, 2017).

\(^4\) It is acknowledged that some research has emerged showing a functional basis of fear of crime. For example, Melde, Berg and Esbensen (2014) found that adolescents who are more fearful of crime are less likely to become the victims and offenders of violent acts. Fearful youth tend to engage in precautionary behaviour (i.e., avoid dangerous people, locations, and activities), subsequently reducing their likelihood of criminal victimisation. However, a number of studies within clinical psychology have shown the detrimental effect that prolonged fear and anxiety can have on the human body (Baum, Garofalo, & Yali, 1999; Barerra, & Norton, 2009; Finlay-Jones, & Brown, 1981). It is argued that although “having some” fear of crime may reduce victimisation risk, once it reaches a particular threshold it can have a serious impact on an individual’s quality of life and levels of social interaction (Stafford, Chandola, & Marmot, 2007).
The present dissertation seeks to determine what is driving fear of crime and risk perception within individuals' environments. Specifically, this dissertation reconceptualises the quantitative study of fear of crime by (a) testing alternative measures of crime fear; (b) introducing and evaluating novel methods used to collect context-dependent information about fear of crime; and (c) developing and testing new theoretical models of victimisation worry to explain why people are fearful of crime in their immediate environment. The proceeding introduction chapter sets the scene for the development of the research questions that will guide the current research. The first section of this chapter, Section 1.2, describes the theoretical perspectives that inform our current understanding of fear of crime. Next, the existing state of empirical knowledge on fear of crime is outlined in Section 1.3. This is followed by a synthesis of the measurement, methodological, and theoretical shortcomings of the existing fear of crime literature in Section 1.4. Then, in Section 1.5, three studies used to address these shortcomings are outlined. Finally, Section 1.6 discusses the remaining structure of the dissertation, which is comprised of five manuscripts produced from these three studies.

### 1.2 What Theoretical Perspectives Inform Current Research on Fear of Crime

Many theoretical perspectives inform our understanding of fear of crime and why people feel vulnerable to criminal victimisation within their neighbourhoods. Early research on fear of crime grew from the idea that perceived criminal vulnerability could be linked to actual occurrences of crime within neighbourhoods (Brunton-Smith & Sturgis, 2011). Specifically, it was argued that when crime levels within a neighbourhood are high, fear of crime is subsequently elevated. This proposition is known as the *victimisation risk hypothesis*, and dominated much of the early fear of crime literature. Despite the intuitive appeal of this hypothesis, most existing research has identified weak correlations between neighbourhood crime rates and fear of crime (Liska, Lawrence, & Sanchiricom, 1982;
Taylor, 2001). Moreover, in contention to the victimisation risk hypothesis, extant literature suggests that those who are the least likely to become victims of crime experience the highest levels of fear5 (i.e., women and the elderly) (Hale, 1996; Killias, 1990; Warr, 1984). This has led many to believe that fear of crime is not a response to direct crime risk, but is rather a response to perceived physical and social cues within the environment that signify the potential for crime to occur (Ferraro, 1996; Innes, 2004).

These arguments have led to contemporary work focusing on the relationship between fear of crime and subjective perceptions of victimisation risk, rather than objective measures of crime and criminal victimisation. This is what Warr (1987) refers to as “sensitivity to risk,” which he defines as the “relation between fear of a particular offense…and the perceived risk of that offense” (p. 30). In this context, fear of crime is expected to be heightened when a person believes that a crime is especially egregious, when a person believes he or she has little control over becoming a crime victim, and/or when a person believes that the consequences of victimisation—were it to occur—would be extreme (Killias, 1990). Warr’s risk sensitivity hypothesis has been substantiated in studies exploring perceived vulnerabilities and fear of crime. For example, Jackson (2009) found that females worry more frequently than males about victimisation partly because (a) they feel less able to physically defend themselves; (b) they have lower perceived self-efficacy (i.e., control); (c) they have higher perceived negative impact; and (d) they see the likelihood of victimisation as higher for themselves and for their social group.

In addition to the victimisation risk and risk sensitivity hypotheses, researchers have also hypothesised a link between neighbourhood structural dynamics and fear of crime. Informed primarily by social disorganisation (Shaw & McKay, 1942) and broken windows

5 It is acknowledged that there are some types of crime where women are more likely to become victims (i.e., sexual assault), and when accounted for it is expected that women will be more fearful towards these types of crime. The impact of contemporaneous offences (fear of sexual intrusion) on general fear of crime experienced by women is described in more detail in Chapter 4 of this dissertation.
FEAR OF CRIME IN TIME AND PLACE

(Wilson & Kelling, 1982) theories, existing macro-level approaches to understanding fear of crime have investigated whether neighbourhood structure, social cohesion, and community incivilities influence attitudes towards personal victimisation. Specifically, this research seeks to understand whether neighbourhood structure influences fear of crime, often focusing on the effects of particular exogenous neighbourhood characteristics, including the racial and ethnic composition of neighbourhoods, socioeconomic status of residents, levels of unsupervised youths, and rates of unemployment (Carcach, Frampton, Thomas, & Cranich, 1995; Covington & Taylor, 1991; Liska et al., 1982; Roundtree, 1998; Taylor & Covington, 1993).

Looking more closely at the process of fear development, existing theoretical work also considers two types of neighbourhood cues that affect perceptions of victimisation risk: physical cues and social cues. Physical cues include graffiti, litter, and discarded needles, whereas social cues include such things as loud neighbours and unsupervised or unruly youths congregating in an area. Farrall, Gray, and Jackson (2007) and Hale (1996) offer comprehensive reviews of this literature, but the general consensus is that there is a strong, positive relationship between many indicators of neighbourhood incivility and fear of crime. As a result, the incivility hypothesis has emerged as one of the key theoretical perspectives used to explain variability in fear of crime (Brunton-Smith & Sturgis, 2011; Tseloni, 2007).

More contemporary theoretical perspectives such as the signals crime perspective (SCP) have been developed to further describe the link between disorder and victimisation risk. Innes (2004) defines a signal crime as a “criminal incident that is interpreted as indicating the presence of criminogenic risk.” (p.350). Signals of disorder are denoted by physical and social cues within the environment, which in turn shape risk perceptions. He also describes two other types of signals related to fear of crime—control signals and signal events. Control signals relate to communication between individuals about social control
actions underway in neighbourhoods, which are believed to moderate and shape individuals’ perceptions of risk. On the other hand, signal events relate to immediate incidents that are not defined by legal conventions as “crimes” but nevertheless may signal community decline and in turn shape risk (Innes, 2004). The basic premise of the SCP is that some types of crime may amplify individuals’ levels of perceived crime risk, while others may not. This amplified risk produces possible affective (i.e., feelings of concern in relation to specific types of crime) and behavioural responses (i.e., avoidance of a particular place). At present, evaluations of the SCP have been restricted to the European context, using qualitative methodologies and small samples (Innes, 2004). Thus, more empirical work is needed to determine whether individuals represent crime in respect to the four distinct signals outlined by Innes (2004).

In addition to the incivility hypothesis, theories of social integration have also influenced our understanding of fear of crime. These perspectives draw upon the substantial literature on collective efficacy within neighbourhoods (Sampson, 2004; Sampson & Raudenbush, 1999; Sampson & Raudenbush, 2001). A number of studies within the fear of crime literature have identified neighbourhoods that are perceived as “socially cohesive” have lower levels of fear of crime, in comparison to neighbourhoods that are perceived to be lacking social cohesion. For example, Gainey and colleagues (2011) found that residents who perceived that their community had lost control over crime and disorder were more likely to fear crime. More contemporary work supports this link, with Yuan and Mcneeley (2016) finding that individuals who had higher levels of trust towards their neighbours and believed their neighbours would intervene if a crime were to occur were less likely to report feeling fearful of burglary.

Finally, new contemporary social-psychological models are emerging within the literature to further explain fear of crime and risk perception formation. Typically, these new
models reconceptualise fear in terms of environmental perceptions, beliefs about crime, perceptions of victimisation risk, and/or anxiety about victimisation (Farrall et al., 2007; Jackson, 2004a, 2005, 2009, 2013). Moreover, these new social-psychological models allow for a better assessment of interactions between psychological and sociological predictors of fear of crime, and converge existing theoretical perspectives like those described above. For example, building on Ferraro’s (1995) theoretical model of fear, Jackson (2004a) proposed a social-psychological fear-of-crime model using individuals’ interpretations of both the social and physical make-up of their communities, their perceived likelihood of victimisation, general beliefs about the relative frequency with which crime occurs, and whether individuals could control becoming a crime victim—as well as the consequences of victimisation if it were to occur. A measure of authoritarianism was also included in this model, but unlike the other predictors, it did not demonstrate a significant effect on risk perception.

The validity and reliability of these new measures of crime fear have been established (Jackson, 2005). For example, using data from residents living in two contrasting UK neighbourhoods, Jackson demonstrated that (a) the degree to which people worry about crime, (b) the perceived likelihood of victimisation, (c) the perceived frequency with which crime occurs, (d) the perceived ability to control crime, and (e) the perceived consequences of victimisation had strong scaling properties. Furthermore, he demonstrated that crimes against persons were judged differently than relatively less severe offences (i.e., crimes against property). Finally, results indicate that the five constructs tested were empirically discrete, supporting a structural process model of fear like that displayed in Figure 1.
Signs along pathways (+/-) indicate directions of hypothesised relationships implied by the model

*Figure 1. Jackson’s (2005) Social-Psychological Model of Victimisation Worry*

To summarise, a number of theoretical perspectives are used to understand fear of crime, including the victimisation risk hypothesis, risk sensitivity/vulnerability hypothesis, incivility and social integration hypotheses. Social-psychological process models of victimisation worry have been developed to synthesise these theoretical perspectives of fear, and have been validated in Europe. In addition to drawing upon a number of different theories and models to understand individual’s fear of crime, our existing empirical knowledge of crime fear has been heavily influenced by specific measurement and methodological approaches. These are described next in Section 1.3.

1.3 What is the Current State of Empirical Knowledge

Since the 1980s, many questions about fear of crime have appeared in national victimisation surveys around the world, including the British Crime Survey (UK)\(^6\), the

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\(^6\) The British Crime Survey has been renamed the Crime Survey for England and Wales (CSEW). The CSEW no longer reports on crime and disorder trends in Scotland. The Scotland government commissioned a new survey for its residents titled: The Scottish Crime and Victimisation Survey (SCVS).
National Crime Survey (US)\textsuperscript{7} and the Crime Victimisation Survey (AUS). The most frequently used questions in early fear of crime surveys relate to self-rated assessments of safety (Jackson, 2004a)\textsuperscript{8}. For example, “How safe do you feel walking alone in this area, after dark?” At the most simplistic level, the frequencies obtained in response to this query can provide an indication of how many people feel safe versus those who do not feel safe (e.g., 43% feel safe walking alone, 57% feel unsafe walking alone). However, many scholars have criticised the simplistic and narrow nature of these questions because they do not capture concrete experiences of fear of crime, but rather general unease whilst walking alone in a particular area (Garofalo, 1981). That is, responses to such questions about personal safety are dependent on whether the respondent is actively thinking about crime during the survey or whether they perceive the area as unsafe due to other environmental factors that are possibly unrelated to crime (e.g., poor street illumination may impact visibility of footpaths at night, thereby increasing the risk of a fall when walking alone at night).

Due to these criticisms, Farrall and Gadd (2004) argue that fear of crime questions should ask respondents whether they have felt fearful of crime in the past; and for respondents who acknowledge that they have, asking them how often they have felt fearful and the intensity of these fearful episodes. Hough (2004) also suggests that existing fear-of-crime measures would be improved if they identified the frequency with which fear is observed; and more importantly, if they offered insight into the intensity of fear felt among respondents who are afraid.

\textsuperscript{7} The National Crime Survey has been renamed the National Crime Victimisation Survey (NCVS). The NCVS currently does not contain any questions designed to measure fear of crime. All lifestyle questions contained in the NCVS were removed in July 2000.

\textsuperscript{8} It is acknowledged that there exists a number of qualitative approaches to measuring experiences of fear of crime (see for example, Innes, 2004; Lane, 2003; Pain, 2001). However, because this dissertation is restricted to a quantitative evaluation of fear of crime, I have chosen to not elaborate on the qualitative measurement of fear in Chapter 1. Instead, I recognise the importance of qualitative work to the fear of crime scholarship in the proceeding chapters, where I present my research findings. I also discuss in Chapter 6 of the current dissertation how scholars can triangulate quantitative and qualitative data/methods in future studies.
Traditional measures of fear also ignore other important dimensions of risk perception, beyond just frequency and intensity. For example, Jackson and colleagues argue that measures should also evaluate cognitive features of crime fear, including perceptions of control over victimisation as well as its consequences (Jackson, 2004, 2009; Jackson, Allum, & Gaskell, 2005). Still others have demonstrated the need to improve existing fear of crime measures by aiming to understand how beliefs about crime influence attitudes towards vulnerability, and by identifying the specific factors (e.g., social networks, mass media, and/or incivility or disorder) that affect these perceptions (Cates, Dian, & Schnepf, 2003; Jackson, 2004, 2006, 2009). As a result of these recommendations, contemporary studies focus on measuring the intensity of victimisation experiences (Farrall & Gadd, 2004) and frequency of worry about crime, along with other important predictors of fear such as perceived victimisation risk (Jackson, 2005).

In addition to questions used to test fear of crime, there also exist several traditional and emerging methods for collecting survey data on fear of crime. Most empirical knowledge on fear of crime is derived from cross-sectional paper-pencil surveys (Jackson, 2005; Hale, 1996). Paper-based surveys are useful in the fear of crime methodology because they allow researchers to assess crime fear using representative samples from the population. Using more technological methods (i.e., online surveys) may restrict researchers’ ability to establish baseline levels of fear of crime within the community because some residents, particularly the elderly, may not have access to computers or have limited computer proficiencies. Therefore, at present, it is difficult to test age-related change in fear of crime using digital methods of survey delivery. Although these traditional methodological approaches to the measurement of fear of crime have uncovered important information about

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9 It is worth acknowledging that online survey tools (e.g., Qualtrics) are becoming more common in academic institutions, and thus more researchers are using online survey tools to collect cross-sectional data from respondents about their fear of crime to reduce the administrative and cost burdens of mail surveys.

10 As generations continue to age and technology becomes more affordable, access to technology and lack of computer proficiency may become less of a barrier to online survey methodologies.
ongoing patterns of fear experienced in the neighbourhood context, less attention has been given to testing fear of crime reactions as they are experienced in the “here and now” and across an individual’s routine activities. This is important, because just like crime events, fear of crime is believed to fluctuate in time and space and this has resulted in many scholars advocating for more location-specific fear of crime research to be undertaken (Brantingham & Brantingham, 1981; Felson, 1994; Fisher & Nasar, 1995; Solymosi, Bowers, & Fujiyama, 2015).

Spatial and temporal variability in fear of crime can be assessed using traditional longitudinal methodologies (i.e., paper-pencil surveys and telephone surveys), but these approaches may be costly for researcher budgets (Yun & Trumbo, 2000). Recently, more cost-efficient technologies have been introduced to assess spatial and temporal patterns in emotion and social behaviour in disciplines outside of criminology (e.g., health psychology). These approaches utilise smartphone devices to collect momentary data from participants—commonly referred to as Ecological Momentary Assessments (EMAs). In respect to fear of crime, only one known study has used mobile technology to collect context-dependent information on fear of crime (Solymosi, et al., 2015).11

Solymosi et al. (2015) assessed the effectiveness of a smartphone application (app) designed to collect information on crime fear. Solymosi and colleagues developed the Fear of Crime Application (FOCA) using java-programming language. The application was available for Android devices only, and six students were selected to trial it for one month. FOCA was designed to first present an initial pre-experiment questionnaire. After completion of the pre-experiment questionnaire, participants were “pinged” surveys periodically, asking them to answer the following momentary fear of crime question: “In this moment, how worried are you about becoming a victim of crime?” Various response

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11 For brevity, the strengths and weaknesses of using mobile technology to collect spatial and temporal data from respondents are not discussed. Instead, they are discussed in proceeding chapters that present research findings from studies using mobile technology. This reduces repetition of content in the current dissertation.
categories were provided to participants, allowing them to select the most appropriate response at the time they were pinged by the application. GPS location was also recorded, allowing the researchers to map participants’ patterns of fear. Participants were pinged up to four times a day, at predefined times. Initial results of the study suggest that there is intra-person variation in fear of crime. In other words, fear of crime can be regarded as a dynamic phenomenon that differs within an individual, based on time and place.

In summary, there is ample empirical evidence that illustrates the conceptual weakness of traditional fear of crime measures (Farrall, Ditton, Bannister, & Gilchrest, 1997; Jackson, 2009; Warr, 2000). Collectively, this scholarship demonstrates that they fail to acknowledge an important truth about fear of crime: It is a complex interplay of emotional, behavioural, and cognitive responses to crime risk. Therefore, contemporary measures have been developed to address these criticisms and aim to measure broader dimensions of fear of crime (i.e., its intensity and frequency). In reference to existing methods used to capture fear of crime, paper-pencil surveys are often relied upon for establishing baselines of fear of crime in the community. However, alternative methods are emerging that aim to test whether context-dependent fear of crime data can be collected using mobile technology, indicating a shift in our empirical understanding of fear of crime from a series of experiences or “remembered events” that have occurred in the past to an event that occurs within the proximate environment of an individual.

1.4 Shortcomings Identified in Existing Scholarship

1.4.1 Measurement. As described in Section 1.3, doubts about the utility, validity, and reliability of traditional quantitative measures of crime fear have been raised over many years (Bernard, 1992; Bowling, 1993; Farrall et al, 1997; Fattah, 1993; Jackson, 2004a, 2005; Skogan, 1981; Zauberman, 1985). Some researchers have also argued that surveys are too restrictive in the overall measurement of perceptions of crime, disorder, and social
environment (Pain, 2001, Sparks, Girling, & Loader, 2001). However, to date, only a limited number of validation studies have been conducted to assess alternative quantitative measures of fear of crime and risk perception (see, for exceptions, Ditton et al., 1998; Ditton, Bannister, Gilchrist, & Farrall, 1999; Farrall et al., 1997; Jackson, 2005). As explained in Section 1.3, traditional measures lack precision and accuracy when it comes to measuring the multidimensionality of fear of crime (Farrall et al., 1997; Snedker, 2015). Therefore, the current research aims to address the lack of validation studies conducted on fear of crime by testing alternative measures of fear of crime and victimisation risk in a new context. Specifically, the current research will adopt established social-psychological measures of victimisation worry (Jackson, 2005) to understand fear of crime among Australians. As stated in Section 1.2, these alternative measures of fear of crime may provide researchers with an opportunity to examine a number of theoretical dimensions related to fear of crime, such as perceptions of victimisation risk and consequences of victimisation.

The model and measures have been validated in Europe, but assessments outside of this environment have yet to be undertaken. Specifically, it is unknown whether the established model, derived from these measures can explain how Australian’s react to crime and disorder. By answering these questions with a sample drawn from Australian residents, the robustness of previous assessments of contemporary measures of fear can be evaluated. As a result, findings generated will contribute to a broader understanding of fear of crime; and more specifically, they will help improve our awareness of relevant measurement issues that affect fear of crime research. Moreover, the model derived from these measures of victimisation worry cannot be advanced using data collected from other Australian samples until it is validated within this context.

1.4.2 Methodological. Traditional methodological approaches in fear of crime research are in need of innovation. Prior work on fear of crime has relied on traditional
survey methodologies (i.e., paper pencil surveys) to inform our empirical knowledge on fear of crime and what it is a response to within the environment. This reliance on traditional survey methods like paper pencil surveys has limited researchers’ ability to capture fear of crime data with strong ecological validity. In order to address these methodological gaps, in regard to traditional survey methods used to examine fear of crime, researchers have proposed novel techniques for capturing context-dependent data on individual’s social behaviour (i.e., mobile technology). As described in Section 1.3, smartphone devices have been identified as a potentially useful tool for testing and examining perceptions of crime in time and place (Solymosi et al., 2015). These devices allow researchers to flexibly control and time the triggering logic of surveys and information to a study participant.

Given these promising developments, data collected from smartphone devices may allow researchers to collect and examine reliable contextual and temporal data on fear of crime. However, at present, researchers still do not know whether this technology can be leveraged in fear of crime research, given the limited empirical base—with exception to Solymosi et al. (2015). Moreover, it is unknown how alternative measures of fear of crime are affected in respect to reliability and validity when using this novel survey delivery method. Therefore, in addition to testing alternative measures of fear of crime, the current research aims to assess whether mobile devices can be used to collect meaningful context-dependent data on fear of crime and risk perception formation. By collecting this type of data researchers will be able to show whether more accurate and ecologically valid data about fear of crime can be collected using this data collection method. This will also provide a foundation upon which models of victimisation worry that consider the momentary context of an individual (see Section 1.4.3) can be built.

1.4.3 Theoretical. As described in Section 1.2, there are a number of important theoretical perspectives used to understand fear of crime. Attempts have been made to
converge these existing theoretical perspectives into contemporary social-psychological process models of victimisation worry, allowing for a more accurate assessment of the interactions between psychological and sociological predictors of fear (Jackson, 2005). At present, these models measure retrospective accounts of worry—typically over the period of one month, without consideration given to the momentary environment. By developing and testing momentary victimisation worry models, researchers will be able to compare differences between these first-generation and second-generation models of fear of crime, providing further insight into the underlying social-psychological processes of fear of crime and risk perception formation. Thus, the current research will involve the development of a momentary model of fear of crime, which will contain new momentary measures, based on established models of victimisation worry discussed in Section 1.2 (i.e., Jackson’s model). Moreover, assessments of the new model will determine how it can inform our knowledge on fear of crime and what it is a response to within the immediate environment.

1.5 Responses to Gaps in the Contemporary Literature

The current dissertation is comprised of three studies; each is designed to address the above measurement, methodological, and theoretical shortcomings within the fear of crime literature. Collectively, this body of work addresses the following research question: How can we better understand fear of crime and perceived victimisation experiences in time and place using alternative measures of crime fear, innovative technologies, and momentary models of victimisation worry? This overarching research question is supplemented by four focused research questions that are answered by the three studies. Below is an outline of each study, the research questions they answer, the guiding literature that inform them, the methodology used\(^{12}\), and the publication outputs they have produced.

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\(^{12}\) For brevity, the methodology for each study is outlined in respect to the study location, number of participants and the process of recruitment. Specific details about the characteristics of each sample in each study are provided in the outputs produced in Chapters 2 through 6. Additionally, discussion and justification of statistical methods to be used in each study are described in the proceeding chapters.
1.5.1 Study 1: The 2014 Gold Coast Community Survey. The first study consists of a fear of crime survey undertaken on the Gold Coast, Australia—the 2014 Gold Coast Community Survey (GCCS). The GCCS was a self-administered mail survey of residents living on the Gold Coast in 2014. The survey instrument included questions designed to measure all dimensions of victimisation worry contained in the established model outlined in Section 1.4.1 (see Appendix A for the GCCS survey instrument). The 2014 GCCS was funded by the Key Centre for Ethics, Law, and Governance (Griffith University)\textsuperscript{13}. In addition, ethical approval to conduct the survey was obtained from the Griffith University Human Research Ethics Committee (Protocol No: CCJ/40/13/HREC).

1.5.1.1 Research questions. The GCCS was designed to answer two research questions related to measuring perceptual indicators of fear of crime (Section 1.4.1): (a) Are established measures of fear of crime and risk perception reliable and valid when administered in Australia; and if so (b) What new knowledge can be produced in relation to particular questions about fear of crime when applying an established model of victimisation worry?

1.5.1.2 Guiding literature. As described in Section 1.3, many quantitative measures of fear of crime have been developed. However, existing measures used to describe fear of crime in the neighbourhood context are reliant on perceptions of safety questions (i.e., How safe are you when walking alone in your neighbourhood after dark?). These questions have limited our understanding of what fear of crime is actually a response to within the neighbourhood context, because they do not specifically measure concrete experiences of criminal victimisation (Hale, 1996). Scholars have called for more validation studies to be conducted on fear of crime, to assess its multidimensional nature (Farrall et al., 1997). Therefore, the current study was guided by these recommendations from Farrall et al. (1997)\textsuperscript{13}

\textsuperscript{13} The Key Centre for Ethics Law and Governance and The Centre for Excellence in Policing and Security were merged in 2015 and are now the Griffith Criminology Institute.
and Jackson (2005). Specifically, the current study aimed to determine whether an established model proposed by Jackson can be used to explain Australians’ reactions to crime and disorder; and if so, how the model can be used to better understand issues related to fear of crime (i.e., the effect of knowing about crime prevention programs on fear of crime and the gender-victimisation paradox).

After determining whether this established model could be used to understand Australians’ reactions to crime and disorder, further advancements to the model could be made and tested using additional data collected from Australian residents. Therefore, this study sets the foundations for the next two studies that will introduce a new method designed to capture more ecologically valid fear of crime data (i.e., mobile technology; Study 2) and extend established models of victimisation worry in order to understand transitory experiences of crime and disorder (Study 3).

1.5.1.3 Methodology. For Study 1, a simple random sample of 2,354 Gold Coast residential addresses was drawn from an address database obtained from the State of Queensland’s Department of Natural Resources and Mines. Data were collected over four waves, consistent with the Tailored Design Method (Dillman, Smyth, & Christian, 2009). In wave one, potential participants received a survey notification letter in the mail. The notification letter provided information about the study and details for when the survey would arrive in the mail (see Appendix B).

Wave two consisted of the questionnaire package, which contained a welcome letter (see Appendix C), an information sheet describing the study in detail (see Appendix D), the Gold Coast Community Survey (GCCS), and a prepaid return envelope. Wave three consisted of a reminder letter, which was mailed to individuals who had not returned a completed survey (see Appendix E) as well as a replacement questionnaire and prepaid return envelope. The final wave of mailing consisted of the final reminder letter to participants (see
Appendix F), a replacement questionnaire and a prepaid return envelope. The GCCS data collection period began in March and ended in April 2014. At the end of the data collection period, 713 Gold Coast residents had returned and completed a survey, yielding a response rate of 30%. Individuals were not incentivised to participate in the GCCS study.

1.5.1.4 Publication output. A total of three manuscripts were produced from the GCCS data. These manuscripts answer the first and second research questions of the current dissertation. The first manuscript (Chapter 2) aims to validate the established measures and model of victimisation worry within Australia, thereby answering Research Question 1 (RQ1). The next two manuscripts (Chapters 3 and 4) demonstrate how the model of victimisation worry derived from these measures could be used to better understand specific issues related to fear of crime (i.e., the effect of knowing about crime prevention programs and gender differences in fear), thereby answering Research Question 2 (RQ2).

1.5.2 Study 2: The iExperience pilot study. After showing that the model of victimisation worry can be used to explain Australians’ reactions to crime and disorder, the next step of this research is to introduce new methods designed to improve the ecological validity of fear of crime data, thereby enhancing existing measures of victimisation worry tested in Study 1. The second study of this dissertation is a pilot study that aims to determine whether mobile technology can be leveraged to collect context-dependent data on fear of crime. As described in Section 1.4.2, our existing empirical knowledge on fear of crime is informed primarily by cross-sectional paper-pencil surveys. These surveys have limited our ability to capture fear of crime as it occurs in the proximate environment. One way of addressing this shortcoming, in respect to ecological validity of current fear of crime measures, is to develop mobile applications (apps) to collect context-dependent information on fear of crime. Therefore, Study 2 involved the development of a mobile app designed to
collect fear of crime data using the measures of victimisation worry tested in Study 1. The mobile app is called iExperience (IE).

The IE app was developed by researchers from the School of Criminology and Criminal Justice and the School of Information and Communication Technology at Griffith University. Strategic development funding was provided by the School of Criminology and Criminal Justice in 2014 in support of this study. Full ethical clearance for both the IE app and the fear of crime survey measures included in it was granted by the Griffith University Human Research Ethics Committee in 2014 (HREC; Protocol No: CCJ/01/15/HREC & CCJ/40/14/HREC).\(^\text{14}\)

1.5.2.1 Research questions. The iExperience pilot study was designed to assess whether ecologically valid and reliable fear of crime data could be collected using a smartphone app. This study answers the third research question (RQ3) of the current dissertation, which is: *Can mobile technology be leveraged to collect meaningful context-dependent data on the various dimensions of fear of crime and risk perception contained in established social psychological process models of victimisation worry?*  This third research question addresses key methodological gaps identified within the fear of crime literature, described in Section 1.4.2.

1.5.2.2 Guiding literature. The iExperience pilot study is guided by the existing literature exploring perceptions of crime in time and place. Specifically, the physical landscape and social geography of “places” have been found to affect perceptions of crime, which has been documented in the literature at varying scales (see Section 1.2 for further detail). In terms of the physical landscape, macro-level sociological theories have long argued that neighbourhood structural factors can disrupt a community’s ability to self-

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\(^{14}\) A total of two ethics applications were submitted and approved by the Griffith University Human Research and Ethics Committee. These applications were for (a) the platform that the survey was delivered on (i.e., iExperience) and (b) the survey instruments that were to be included on the app (i.e., The Perceptions of Crime Survey).
regulate, which in turn causes crime and delinquency (Park & Burgess, 1925; Shaw & McKay, 1942) (see also, Section 1.2). Existing contemporary research also shows that perceptions of neighbourhood disorder and physical decay influence perceptions of crime (Brunton-Smith & Sturgis, 2011). Moreover, extant literature suggests that adverse perceptions of crime can cluster within socially disorganised neighbourhoods, similar to the way that crime patterns form hot spots (Wyant, 2008). This literature suggests that we must better understand the way in which individuals interact with their proximate environment if we are to better understand how their attitudes, such as fear of crime, are affected by it.

To test fear of crime in the proximate environment, researchers have proposed using mobile technology. As described in Section 1.4.2, prior to the iExperience pilot study, Solymosi et al., (2015) were the only known researchers to test whether mobile technology could be used to collect context-dependent information on fear of crime. However, this study is limited in relation to the measures used to capture fear of crime (i.e., single item measures). Advancements made to the measurement of fear of crime demonstrate that fear should be treated as a multidimensional concept (Jackson, 2005). Therefore, the proposed pilot study using the IE application aims to utilise the social psychological measures tested in Study 1, thereby determining the first feasibility of collecting data on these measures using mobile technology.

1.5.2.3 Methodology. Data from the IE pilot study were collected using a convenience sample. A total of 20 undergraduate students attending Griffith University’s Gold Coast Campus were recruited to participate in the study.15 These students were recruited using the Survey’s at Griffith Email Broadcast Announcement.16 This announcement is sent to all Griffith University undergraduate student email accounts on a monthly basis,

15 Study enrolment numbers are comparable to Solymosi et al.’s (2015) study.
advertising studies seeking volunteers/participants for that month. Recruitment flyers and survey information sheets are provided in Appendixes G and H, respectively, for the IE app.

Participants were instructed to download the IE app for a period of one month from Apple’s App Store\textsuperscript{17}. Once agreeing to the terms and conditions of the survey, the participant was automatically pinged a pre-experiment questionnaire, regardless of their current location. The pre-experiment questionnaire collected demographic information from the participant and included their age, gender, country and year of birth, education, legal marital status, housing tenure, and Aboriginal/Torres Strait Islander status. After answering all the demographic questions, the participant was instructed to select “Submit”\textsuperscript{18}. Once submitted the app recorded the participant’s location and tracked them during the course of their routine activities. When the participants entered a ping-able location within the study area (i.e., the Gold Coast), the app automatically triggered and “pushed” the perceptions of crime survey to the participant’s phone, which received an automatic notification to “complete the survey”\textsuperscript{19}. The survey instrument, as described above was the same as the GCCS survey—Jackson’s (2005) social-psychological measures of victimisation worry. Once the survey was completed, the app recorded the location of the original ping and the time the survey was completed\textsuperscript{20}. At the end of the data collection period, a total of 50 surveys were submitted using the IE app.

\textsuperscript{17}iExperience App was only available on iOS platform due to financial constraints with purchasing Android plugins.
\textsuperscript{18}Participants only had to complete a demographic questionnaire once. This means that when participants were pinged by the app again in the future, they did not have to complete another demographic questionnaire. This subsequently reduces respondent burden.
\textsuperscript{19}Ping-able locations are predefined areas within the study site (e.g., the Gold Coast). A total of 10 predefined areas were selected for the current study. EMAs on fear of crime could be triggered to a device located in these areas at any time of the day. Further detail is provided in Chapter 5 of the dissertation.
\textsuperscript{20}For this pilot study, only the longitude and latitude coordinates were recorded for the initial ping of a survey to a participant. In the final study phase of this dissertation (i.e., Study 3), a new app will record the location of where a person completes a survey, along with the time of survey submission. This will allow researchers to first examine the reliability and recording of spatial information in the pilot study, before adding the additional recording feature based on completion of a survey.
1.5.2.4 **Publication output.** A proof-of-concept paper was produced from data collected during the iExperience pilot study (Study 2). The manuscript will report the reliability and validity of measures contained in established victimisation worry models when using data collected from mobile devices, addressing Research Question 3 (RQ3). This study and the manuscript produced from it will also expand significantly upon the existing methods used to capture context-dependent fear of crime, thereby addressing the methodological shortcomings described in Section 1.4.2. Moreover, the results of this manuscript will directly inform the final study of this dissertation and the development of a new momentary model of victimisation worry.

1.5.3 **Study 3: The MetricWire study.** After determining whether established models of victimisation worry can be used to explain reactions to crime in Australia (i.e., Study 1) and whether mobile technology can be leveraged in survey research to collect more ecologically valid data about fear of crime (i.e., Study 2), Study 3 will examine how momentary fear of crime data collected from mobile devices can be used to extend established theoretical models of fear of crime. A commercial vendor called (MetricWire Inc.) developed the mobile app used in the final study. Ethical clearance for Study 3 was obtained from the Griffith University Human Research Ethics Committee (HREC) (Protocol No: 902/16\(^{21}\)) and additional external cloud clearance was granted by Griffith University’s President of Corporate Services and Chief Technology Officer in March 2017\(^{22}\).

1.5.3.1 **Research questions.** Study 3 aims to answer the final research question of the current dissertation (RQ4) which is: *Can momentary models of fear of crime be developed to consider interactions between time, place, and psychological states; and if so, how can these new theoretical models inform our existing knowledge of the social-psychological processes*

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\(^{21}\) The Griffith University Human Research Ethics Committee (HREC) adopted a new protocol numbering system in 2016. This is why the protocol numbers are formatted differently for Study 1 and Study 2, which were granted ethical approval prior to the introduction of the new numbering system.

\(^{22}\) This approval was in accordance with Griffith University’s Cloud Hosting Policy. The policy can be found at: http://policies.griffith.edu.au/pdf/Cloud-Hosting-Policy.pdf
of fearing crime? This final research question addresses key theoretical shortcomings of the current fear of crime scholarship discussed in Section 1.4.3.

1.5.3.2 Guiding literature. Study 3 is guided by the results that will be published from the first two studies. More specifically, Study 1 determines whether the established model developed by Jackson (2005) is reliable and valid in the Australian environment and Study 2 establishes the feasibility of collecting ecologically valid data on fear of crime using this established model. From here, Study 3 builds off this prior work by collecting real time/place data on fear of crime in order to create a new momentary model of fear of crime that addresses the theoretical gaps identified in Section 1.4.3.

Specifically, existing measures of fear of crime have continued to ask respondents to reflect back on their experiences of fear and perceived victimisation risk over time (Solymosi et al., 2015). This has limited researchers’ ability to understand how features of the immediate social and physical environment shape concerns in relation to crime and victimisation experiences in the “here and now”. Therefore, it is recommended that researchers begin to assess momentary states of fear of crime and risk perception, in order to determine whether they can provide insight into fear of crime in time and place (Solymosi et al., 2015). Momentary models of fear of crime would contribute significantly to our existing knowledge on the social-psychological processes involved in fearing crime by enabling researchers to determine what individual- and situational-level factors are important for driving momentary worry about crime and victimisation risk. First-generation models of victimisation worry provide a foundation from which a momentary model of fear of crime can be developed (Jackson, 2005).

In addition to extending upon original constructs contained in first-generation models of victimisation worry (i.e., perceptions of consequences, and control over victimisation), additional constructs of momentary psychological state (i.e., positive and negative affectivity)
will be added to the new momentary model. A limited literature has explored how individual’s emotional state affects their perceptions of place, risk perception and worry about crime. The new momentary social-psychological model of victimisation worry is a more “process-oriented” model that considers the interactions between time, place, psychological state, risk perception and worry/concern about crime.

1.5.3.3 Methodology. For Study 3, data were collected from 72 young adults living in Southeast, Queensland Australia, who had enrolled and completed a number of momentary surveys on fear of crime using the MetricWire mobile app. These participants were recruited from targeted social media advertisements (see Appendix I and Chapter 6 for further information). Specifically, advertisements were targeted on Facebook and Instagram. The recruitment strategy was guided by existing research exploring the effectiveness of social media based recruitment for research in the social sciences (Baltar & Brunet, 2012; Ramo, & Prochaska, 2012). By the end of the study period, a total of 499 momentary fear-of-crime surveys were collected from study participants, using the app.

Participants were instructed to download the app and install it on their smartphones for three months. Momentary fear-of-crime surveys were delivered through the app every three days. Like iExperience, the same pre-demographic questions were asked during Study 3. Self-control and perceived physical ability measures were also added to the pre-experiment questionnaire (see Appendix J for complete questionnaire)\(^{23}\). After participants completed their pre-demographic survey, temporal triggers were automatically set to “ping” the fear-of-crime surveys (Chapter 6 provides further detail about the triggering logic used in Study 3). Each dimension of the first generation social-psychological model was adapted to the momentary environment\(^{24}\). In addition, new measures of positive/negative affectivity

\(^{23}\) These additional questions in the pre-experiment questionnaire were collected for research to be produced after the PhD, and therefore are not utilised in this dissertation. Instead, the focus is on answering the final research question (RQ4) of the dissertation.

\(^{24}\) Detailed descriptions of the new momentary measures are mentioned in Chapter 6 of the current dissertation.
were added to the new fear-of-crime instrument—reasoning for these new measures is provided in Section 1.5.3.2.

1.5.3.4 Publication output. A manuscript was produced from data collected during the MetricWire study (Study 3). This manuscript answers the final research question (RQ 4) of the current dissertation: Can momentary models of fear of crime be developed to consider interactions between time, place, and psychological states; and if so, how can these new theoretical models inform our existing knowledge of the social-psychological processes of fearing crime? This research question is answered by developing and testing the new momentary model of fear of crime that includes all dimensions from the established process model of victimisation worry, along with new momentary dimensions of psychological state (i.e., affectivity). Moreover, connections between dimensions of the new momentary victimisation worry model are tested to determine whether the theoretical relationships between concepts contained in first generation process models of victimisation worry still emerge in momentary data and whether the new momentary model performs adequately using real time/place data. This manuscript will expand significantly on the existing models used to inform researchers understanding of fear of crime, particularly transitory experiences of victimisation risk (see Sections 1.2 and 1.4.3 for further information on existing theoretical perspectives of fear of crime).

1.6 Remaining Dissertation Structure

As described in Section 1.5, the current dissertation consists of a series of published and under review journal articles. This section of the dissertation briefly outlines the layout of the proceeding chapters and specifically where the manuscripts from each study are published or currently under review. In Chapter 2 of the dissertation, the first journal article

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25 The current dissertation does not contain a Literature Review or a Methodology chapter. This is because it is a dissertation by series of publications. Adding these chapters results in increased repetition of content and disrupts the flow of the dissertation. Detailed reviews of the relevant literature and methodology are provided in Chapters 1 through 6. This approach to formatting aligns with prior dissertations submitted at Griffith University (see for example, Barros, 2014).
is presented: (Re)Assessing contemporary “fear of crime” measures within an Australian context published in the Journal of Environmental Psychology (2017 Impact Factor: 3.494). In this journal article, the established model of victimisation worry is used to explain Australians’ reactions to crime and disorder. This journal article provides the foundations for assessing the measures and model of victimisation worry further using data collected from Australian residents.

Chapters 3 and 4 present journal articles that utilise the same data source as Chapter 2 (i.e., the 2014 GCCS). The second article of this dissertation is presented in Chapter 3 and is titled, Crime prevention and reduction programs: How does knowing about community initiatives moderate attitudes towards criminal victimisation? The article is published in the Australian and New Zealand Journal of Criminology (2017 Journal Impact Factor: 0.981). In this manuscript, the social-psychological model of victimisation worry is used to produce new knowledge about fear of crime. Specifically, the model is used to explain variability in dimensions of victimisation worry and fear of crime as a function of awareness of community crime prevention programs within a particular residential area.

The third journal article, presented in Chapter 4, is titled, A social-psychological process of “fear of crime” for men and women: Revisiting gender differences in fear from a new perspective. This manuscript has been submitted for review in the British Journal of Criminology (2017 Journal Impact Factor: 1.818). Once again, the social-psychological model of victimisation worry is used to produce new knowledge on fear of crime. Multigroup structural equation models are used to examine how gender moderates a number of social-psychological dimensions of victimisation worry. Chapters 2, 3, and 4 will show how the established model of victimisation worry can be used to explain Australian residents’ fear of crime and provide new insights into existing issues/debates in the fear of crime literature (e.g., how gender and crime prevention awareness impact fear of crime). From
here, new methods to improve the ecological validity of the established measures and models of victimisation worry are presented in Chapter 5.

Chapter 5 presents the fourth journal article titled, *The geography of crime fear: A pilot study exploring event-based perceptions of risk using mobile technology*. This manuscript is published in the Journal of Applied Geography (2017 Journal Impact Factor: 2.687). It is a proof-of-concept paper, and introduces new methods for improving the ecological validity of the fear of crime measures validated in Chapters 2 through 4. This chapter demonstrates that this approach to collecting fear of crime data is feasible for developing new momentary models of fear of crime. The knowledge produced from this proof-of-concept paper directly informs the final manuscript, which describes and tests a new momentary model of victimisation worry, derived from the existing model tested in Chapters 2 through 5.

Chapter 6 presents the final journal article titled, *The social-psychological process of fearing crime: Developing a new momentary model of victimisation worry using mobile technology*. This manuscript has been submitted for review in the Journal of Research in Crime and Delinquency (2017 Journal Impact Factor: 2.545). The article advances the previous research using established social-psychological models of crime fear (Chapters 2 through 5) and novel methods for collecting more ecologically valid data about fear of crime (Chapter 5). The new validated momentary model of victimisation worry consists of transitory experiences of personal crime worry, perceptions of risk and vulnerability, assessments of incivility and social cohesion within the immediate environment, and momentary affective/psychological state.

Finally, Chapter 7 of the dissertation presents a discussion of the research findings. First, an overall assessment of the contributions to the existing literature made by Studies 1, 2, and 3 is presented. This is followed by a detailed discussion of the findings of the three
studies and manuscripts produced from these studies. The dissertation ends with a presentation of the limitations and recommendations for future directions of fear-of-crime research.
CHAPTER 2: (RE)ASSESSING CONTEMPORARY ‘FEAR OF CRIME’ MEASURES WITHIN AN AUSTRALIAN CONTEXT

This chapter includes a co-authored manuscript. The bibliographic details of the co-authored paper, including all authors, are:


My contribution to the manuscript involved:

As first author of the current manuscript I assisted in the recruitment of participants for the 2017 Gold Coast Community Survey, acquisition of data, all subsequent data cleaning/screening and analyses of SEM and CFA models. I was responsible for writing most sections of the manuscript for initial review, along with my co-author. The co-author (Dr. Hart) assisted primarily with the literature review and method section of the current manuscript. After review, I was responsible for addressing all reviewer comments and revisions under the supervision of Dr. Hart.

(Signed) ___________________________ (Date) 23rd February 2018
Michael Chataway (Corresponding Author)

(Countersigned) ___________________________ (Date) 23rd February 2018
Supervisor: Dr. Timothy C. Hart
2.1 Abstract

Data collected from residents living in southeast Queensland, Australia ($N = 713$) are used to replicate a prior evaluation of multiple indicators of “fear of crime.” Results of confirmatory factor analysis (CFA) and structural equation modeling (SEM) support evidence produced from a UK survey that indicators of worry, belief, control, likelihood, and consequences of victimisation demonstrate good scaling properties. Furthermore, current findings suggest that these constructs are theoretically distinct. Finally, residents’ perceptions of the neighbourhoods in which they live are believed to affect attitudes about crime and are consistent with social-psychological models of crime fear. Current findings are discussed in terms of their implications on understanding fear of crime from both an academic and practitioner perspective.

Keywords: Risk perception, fear of crime, validity and reliability
2.2 Introduction

“Fear of crime” has been the focus of scientific inquiry for nearly half a century. During this time scholars have argued that beliefs about crime are linked to direct experiences with criminal activity (Balkin, 1979; Liska, Lawrence, & Sanchirico, 1982; Skogan & Maxfield, 1981). Alternatively, fear of crime has been explained in terms of one’s sensitivity to risk (Jackson, 2011b; Killias, 1990; Warr, 1987). Considerable attention has also been paid to the impact that macro-level environmental factors and endogenous community dynamics have on perceptions of fear (Box, Hale, & Andrews, 1988; Brunton-Smith & Sturgis, 2011; LaGrange, Ferraro, & Supancic, 1992; Taylor & Covington, 1993; Wyant, 2008). Today, an extensive and growing body of scientific knowledge has informed our understanding of this important social issue.

In addition to establishing various individual and contextual correlates to fear of crime (see Farrall, Jackson, & Gray, 2009 and Hale, 1996 for a review), existing scholarship has identified specific methodological challenges associated with studying this topic (Farrall, Bannister, Ditton, & Gilchrist, 1997; Fattah, 1993; Warr, 2000). For example, surveys often use a single question to measure fear (e.g., How safe do you feel while walking alone in your neighbourhood at night?). However, contemporary scholars have demonstrated that fear of crime is a complex interplay of emotional, behavioural, and cognitive responses to crime risk.

Structural process models of crime fear have been offered as alternatives to traditional measures of risk perception (Farrall et al., 2009; Jackson, 2004, 2009). Unlike previous single-item measures, these models include indicators that reconceptualise fear in terms of (a) the degree to which people worry about crime, (b) the perceived likelihood of victimisation, (c) the perceived frequency with which crime occurs, (d) the perceived ability to control being victimised, and (e) the perceived consequences of victimisation. Using data from a survey of UK residents, Jackson (2005) demonstrated that these new measures of crime fear
are characterised by strong scaling properties, that they are distinct constructs, and that measures of each are reflective of two domains (i.e., property crime and personal crime).

Although the number of studies that now conceptualise fear in terms of these measures are growing, assessments of them outside of the UK and Europe\(^1\) has been limited. The current study begins to fill this gap in the existing literature by re-examining the validity and reliability of contemporary measures of crime fear in an Australian context, thereby adding to our understanding of the scope of Jackson’s (2004, 2009) models. In general, findings from the current investigation contribute to a broader understanding of fear of crime; and more specifically, they improve our awareness of relevant measurement issues that affect fear-of-crime research.

### 2.3 Literature Review

If crime is a relatively rare event, then why are so many people afraid of becoming crime victims? Although a single answer to this question does not exist in the extant literature, our understanding of why people feel vulnerable to criminal victimisation has improved over the past 50 years.

#### 2.3.1 Victimisation risk hypothesis

Early fear-of-crime research grew from the idea that perceived criminal vulnerability was linked to actual levels of crime. It was believed that in times when crime was on the rise, fear of crime would also be elevated. Likewise, individuals who were more likely to experience crime would also be those who feared it the most. This intuitive proposition became known as the victimisation risk hypothesis.

Not only does a substantial body of empirical evidence fail to support the victimisation risk hypothesis, much of the exiting literature suggests that the opposite is true (Lewis & Maxfield, 1980; Smith, Steadman, Minton, & Townsend, 1999). For example, Garofalo (1979) observed that while respondents who are older, female, and whose families earn less are among those most likely to be fearful of crime, they are relatively less likely to experience
victimisation. Similarly, Box et al. (1988) found that certain demographic groups that are typically associated with relatively lower victimisation rates (e.g., females and the elderly) are among those who report being the most fearful of crime. Collectively, results from these and similar studies are more supportive of the crime paradox than of the victimisation risk hypothesis.

Although some studies that support the victimisation risk hypothesis can be found in the literature, they typically focus on problems related to the use of official measures of crime. For example, Balkin (1979) argued that the relationship between fear of crime and objective measures of victimisation cannot be fully understood until victimisation rates consider the extent to which individuals are exposed to crime. Building on this idea, Stafford and Galle (1984) found a high degree of correspondence between fear of crime and victimisation, once victimisation rates were adjusted for risk exposure. Despite these results, over time, academic attention gradually shifted away from victimisation risk and onto alternative explanations of crime fear.

2.3.2 Sensitivity to risk. Instead of trying to explain fear of crime in terms of changes in objective measures of crime or victimisation rates, a substantial body of academic attention focuses on the relationship between fear of crime and subjective perceptions of victimisation risk. This is what Warr (1987) refers to as “sensitivity to risk,” which he defines as the “relation between fear of a particular offense…and the perceived risk of that offense” (p. 30). In this context, fear of crime is expected to be heightened when a person believes that a crime is especially egregious, when a person believes he/she has little control over becoming a crime victim, and/or when a person believes that the consequences of victimisation—were it to occur—would be extreme (Killias, 1990).

First, existing empirical evidence shows that perceived risk of victimisation is systematically linked to fear; but changes in risk perceptions affect levels of fear differently,
FEAR OF CRIME IN TIME AND PLACE

depending on crime type (Ferraro, 1995; Gabriel & Greve, 2003; Jackson, 2001b; Warr, 1984, 1987). For example, a relatively small change in risk perception for rape will correspond to a substantial increase in reported levels of fear among women; but a relatively large increase in risk perception is needed to produce a similar jump in anxiety, if a situation involves a more innocuous offence (e.g., being approached by someone begging for money). Some argue that this link between perceived risk, crime severity, and fear is explained by the availability heuristic (Tversky & Kahneman, 1982) or the tendency to judge the frequency of events by the ease with which the events can be imagined.

Second, sensitivity to risk has been linked to beliefs about one’s ability to control crime and/or how the consequences of victimisation would impact one’s life (Jackson, 2009, 2011b; Warr, 1987). For example, Jackson (2009) found that women worry more frequently than men about crime, in part, because they feel less able to physically defend themselves from crime and also because they feel that they would be more negatively impacted by it. Furthermore, empirical evidence suggests that perceived control and consequence both influence perceptions of fear directly and indirectly via perceived risk (Custer & Van den Bulck, 2013; Jackson, 2011a, 2011b). Today, extensions of Warr’s (1987) original risk sensitivity model consider other psychological influences on fear, including cognitive closure or the desire for definite knowledge on some issue (Kruglanski & Webster, 1996). Jackson (2013) suggests that the need for cognitive closure may “play an important role in the inferences that people make from their environment, their personal victimisation experience, and from hearing about crime” (p. 16).

2.3.3 Neighbourhood structure, community dynamics, and fear of crime.

Studies focusing on characteristics of neighbourhoods and social processes within them offer alternative explanations of crime fear. Informed primarily by social disorganisation (Shaw & McKay, 1942) and broken windows (Wilson & Kelling, 1982) theories, existing macro-level
approaches to understanding fear of crime have investigated whether neighbourhood structure, social cohesion, and community incivilities influence attitudes towards personal victimisation.

Research that seeks to understand whether neighbourhood structure influences fear of crime often focuses on the effects of particular exogenous neighbourhood characteristics, including the racial and ethnic composition of neighbourhoods, socioeconomic status of residents, levels of unsupervised youths, and rates of unemployment (Carcach, Frampton, Thomas, & Cranich, 1995; Covington & Taylor, 1991; Liska et al., 1982; Roundtree, 1998; Taylor & Covington, 1993). Although empirical evidence produced from this body of research provides some support for the idea that fear of crime is causally linked to neighbourhood structure, studies investigating the process by which disorganised communities shape people’s perception of fear offer more promise. For example, Markowitz and colleagues (2001) suggest that fear of crime is part of a larger “feedback loop” that mediates the effects of disorder on social cohesion: as social cohesion decreases, neighbourhood disorder increases, which increases fear of crime, which in turn decreases social cohesion.

Looking more closely at the process of fear development, existing studies also consider two types of neighbourhood cues that affect perceptions of risk: physical cues and social cues. Physical cues include graffiti, litter, and discarded needles; for example, whereas social cues include such things as loud neighbours and unsupervised youths hanging around with nothing to do. Farrall et al. (2007) and Hale (1996) offer comprehensive reviews of this literature, but the general consensus is that there is a strong, positive relationship between many indicators of neighbourhood incivility and fear of crime. It is worth noting, however, that Wyant’s (2008) study of 45 Philadelphia neighbourhoods calls into question these
relationships, by demonstrating that the link between fear of crime and perceived
neighbourhood incivility is explained by the non-random spatial pattern of fear.

2.3.4 Traditional approaches to measuring crime fear. The collective body of
eexisting research associated with fear of crime is extensive and growing. However, scholars
have repeatedly identified issues with how fear of crime is often measured (Farrall, et al.,
1997; Hale, 1996; Warr, 2000). For example, the scientific community has criticised both the
conceptualisation and operationalisation of commonly used indicators of crime fear. As a
result, the validity and reliability of these measures has been closely scrutinised.

Early national surveys administered in the US and the UK that sought to measure fear
of crime relied on questions that did not mention crime specifically, failed to provide a
specific geographical/temporal reference for respondents, and/or described situations that
were purely hypothetical (Garofalo & Laub, 1978, Skogan, 1981). These early indicators of
fear of crime often took the form of a single survey question, such as these:

- “How safe do you feel being out alone in your neighbourhood after dark?”
- “How safe would you feel being out alone in your neighbourhood after dark?”
- “Is there any place around here where you feel unsafe walking at night?”

Questions about fear of crime that are included in more contemporary research now
tend to ask respondents about specific reference periods (e.g., within the past month/year),
geographic boundaries, and/or types of crime. For many years, however, questions designed
to measure fear of crime like those listed above were the norm. Warr (2000) has described
them (critically) as the de facto standard for fear of crime measures.

One of the most obvious problems with traditional fear-of-crime survey questions is
that they ignore the physiological and emotional responses to crime events (Fattah & Sacco,
1989). According to Farrall et al. (1997), they are unconcerned with (a) the frequency with
which respondents feel fearful of crime; and (b) how levels of fear (if observed) vary over
time. Recognising these limitations, Farrall and Gadd (2004) argue that fear-of-crime
questions should ask respondents whether they have felt fearful of crime in the past; and for respondents who acknowledge that they have, asking them how often they felt fearful and how fearful they felt the last time they were afraid. Hough (2004) also suggests that existing fear-of-crime measures would be improved if they identified the frequency with which fear is observed; and more importantly, if they offered insight into the intensity of fear felt among respondents who are fearful.

Traditional measures of fear also ignore other important dimensions of risk perception, beyond just frequency and intensity. For example, Jackson and colleagues argue that measures of crime fear should also evaluate emotional responses to crime, including perceptions of control over victimisation as well as its consequences (Jackson, 2004, 2009; Jackson, Allum, & Gaskell, 2005). Still others have demonstrated the need to improve existing crime fear measures by aiming to understand how beliefs about crime influence attitudes towards vulnerability, and by identifying the specific factors (e.g., social networks, mass media, and/or incivility or disorder) that affect these perceptions (Cates, Dian, & Schnepf, 2003; Jackson, 2004, 2006, 2009).

In sum, there is ample empirical evidence that illustrates the conceptual weakness of traditional fear-of-crime measures (Farrall, et al., 1997; Jackson, 2009; Warr, 2000). Collectively, this scholarship demonstrates that they fail to acknowledge an important truth about fear of crime: That it is a complex interplay of emotional, behavioural, and cognitive responses to crime risk.

2.3.5 A new conceptualisation of crime fear. In response to the issues associated with traditional fear-of-crime measures, more robust models of risk perception have emerged. Typically, these models reconceptualise fear in terms of environmental perceptions, beliefs about crime, perceptions of victimisation risk, and/or anxiety about victimisation (Jackson, 2004, 2005, 2009, Farall et al., 2007). For example, building on Ferraro’s (1995) theoretical
model of fear, Jackson (2004a) proposed a social-psychological fear-of-crime model using individuals’ interpretations of both the social and physical make-up of their communities, their perceived likelihood of victimisation, general beliefs about the relative frequency with which crime occurs, and whether individuals could control becoming a crime victim—as well as the consequences of victimisation if it were to occur. A measure of authoritarianism was also included in this model, but unlike the other predictors, it did not demonstrate a significant effect on risk perception.

The validity and reliability of these new measures of crime fear have begun to be assessed (Jackson 2005). For example, using data from residents living in two contrasting UK neighbourhoods, Jackson (2005) demonstrated that (a) the degree to which people worry about crime, (b) the perceived likelihood of victimisation, (c) the perceived frequency with which crime occurs, (d) the perceived ability to control crime, and (e) the perceived consequences of victimisation had strong scaling properties. Furthermore, he demonstrated that crimes against persons were judged differently than relatively less severe offences (i.e., crimes against property). Finally, results indicate that the five constructs tested were empirically discrete, supporting a structural process model of fear like that displayed in Figure 1.
Although these new measures of crime fear offer clear advantages over traditional indicators (see Jackson, 2005), they have not been validated outside the UK and Europe (see Endnote 1). For example, recent figures from Australia’s Crime Victimisation Survey show that approximately one-fourth of all Australian adults report feeling unsafe alone at home, walking alone at night in their neighbourhood, or taking public transport at night alone (ABS, 2010). These findings are in line with figures from other national surveys, including those from the UK (Jansson, 2007); but it is unknown whether the dynamics of risk perception formation among Australian residents is similar to those among people living in the UK. In other words, there is a need to re-examine contemporary models of risk perception with samples from outside the UK/Europe.
2.4 Methodology

2.4.1 Present study. In a replication of Jackson’s (2005) study, the current investigation begins to fill existing gaps in the relevant literature by pursuing four specific objectives. First, the current study assesses the scaling properties of indicators used to measure five fear constructs (i.e., worry, victimisation, consequences, control, and belief). Second, the five fear constructs are assessed to determine whether they are empirically distinct. Third, the scaling properties of residents’ perceptions of neighbourhoods (see Figure 1) are examined to determine whether they reflect two dimensions of incivility (i.e., social and physical disorder) and social cohesion (i.e., trust/social capital and informal social control). Finally, the hypothesised connections between Jackson’s five dimensions of victimisation worry are examined to determine whether they are influenced by perceptions of the social and physical environment. By answering these questions with a sample drawn from Australian residents, the robustness of previous assessments of contemporary measures of fear can be evaluated. As a result, findings generated from the current investigation will contribute to a broader understanding of fear of crime; and more specifically, they will help improve our awareness of relevant measurement issues that affect fear-of-crime research.

Data used for the current study were obtained from the 2014 Gold Coast Community Survey (GCCS), a self-administered postal survey of residents aged 18 years or older living in southeast Queensland, Australia. A simple random sample of residential and mixed-use household addresses was initially drawn from a property address database obtained from the State of Queensland’s Department of Natural Resources and Mines. Survey-related materials were then mailed to each sampled household—over four waves—in a manner consistent with the Tailored Design Method (Dillman, Smyth, & Christian, 2009). Of the 2,354 valid household addresses included in the initial sample, a total of 713 surveys (30%) were
completed and returned by the end of the data collection period. Residents were not incentivised to participate.

2.4.2 Participants. Details describing the GCCS sample are provided in Table 1.

Most participants are women (64%), Australian born (67%), and report being married at the time the survey was completed (70%). Participants range in age from 18 to 93 (\(Mdn = 57.0\), \(SD = 16.0\)) and the majority reported living in their homes for less than seven years (\(Mdn = 81.2\), \(SD = 123.4\)). Compared to the Gold Coast’s general population, the current sample is overrepresented by women, older residents, and those reportedly married at the time of the survey.

Table 1.

Summary statistics for 2014 Gold Coast Community Survey (GCCS) participants (\(N = 713\))

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(n)</th>
<th>%</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>254</td>
<td>36.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>449</td>
<td>63.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian born</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>234</td>
<td>33.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>476</td>
<td>67.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently married(^a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>209</td>
<td>29.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>492</td>
<td>70.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>692</td>
<td>18</td>
<td>93</td>
<td></td>
<td>57.0(^b)</td>
<td>15.9</td>
</tr>
<tr>
<td>Time at current residence (months)</td>
<td>691</td>
<td>1</td>
<td>1062</td>
<td></td>
<td>81.2(^b)</td>
<td>123.4</td>
</tr>
<tr>
<td>Neighbourhood characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivilities</td>
<td>1</td>
<td>4</td>
<td>3.1</td>
<td></td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Social cohesion</td>
<td>1</td>
<td>5</td>
<td>2.4</td>
<td></td>
<td>0.9</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values under the percentage columns reflect the percentage of valid responses. For the seven incivilities measures, 1 = A very big problem and 4 = Not a problem at all. For the seven social cohesion measures, 1 = Very strongly agree and 5 = Very strongly disagree.

\(^a\)Currently married includes \textit{de facto} marriage.

\(^b\)Reflects the median value.

In terms of neighbourhood incivilities, on average, participants reported living in communities where incivility is not a serious problem (\(M = 3.1\), \(SD = 0.6\)). Likewise,
participants reported that their neighbourhoods are fairly strong, in terms of social cohesion ($M = 2.4$, $SD = 0.9$).

2.4.3 Measures. Consistent with Jackson’s (2005) approach, the current study assesses five dimensions of fear, two dimensions of neighbourhood characteristics, and two types of crime.

2.4.3.1 Fear of crime. The five constructs associated with crime fear and that are used in the current study reflect the same constructs examined by Jackson (2005): worry, likelihood, consequences, control, and belief. Worry is defined as the frequency with which residents worry about becoming a crime victim. Victimisation is measured in terms of residents’ estimates of the likelihood of falling victim to crime, within their neighbourhood, sometime during the next month. Control is defined as residents’ perceptions about their ability to control becoming a crime victim in their own neighbourhood, whereas the consequences of victimisation is assessed by asking participants about how their lives would be affected if they were victimised. Finally, belief is defined as how often participants think crime will likely occur within their neighbourhoods during the next month. The Appendix contains response sets for each of the five constructs.

2.4.3.2 Neighbourhood characteristics. Two sets of questions were used to assess neighbourhood perceptions. First, residents’ perceptions about social and physical cues of incivility were determined by recording responses to seven neighbourhood conditions. Residents were asked to think about their neighbourhood (i.e., anywhere within a 15-minute walk of their home) and indicate how much of a problem each of the following were: (a) rubbish or litter lying around; (b) people using or dealing drugs; (c) people being drunk or rowdy in public places; (d) vandalism, graffiti and other deliberate damage to property or vehicles; (e) dangerous dogs / irresponsible owners; (f) teenagers hanging around on the
streets; and (g) not enough things for young people to do. Responses to each question were measured on a 4-point scale, where 1 = *A very big problem* and 4 = *Not a problem at all*.

Second, participants’ views about *social cohesion* or their perceptions of trust and informal social control among neighbourhood residents are included in the current study. Specifically, residents were asked how much they agreed or disagreed with seven statements: (a) The people who live here can be relied upon to call the police if someone is acting suspiciously; (b) If any of the children or young people around here is causing trouble, local people will tell them off; (c) If I sensed trouble whilst in this area, people who live here would help me; (d) This area is a close, tight-knit community; (e) This area is a friendly place to live; (f) This area is a place where local people look after each other; and (g) Most people who live in this area trust one another. Participants’ answers were measured on a 5-point scale, where 1 = *Very strongly agree* and 5 = *Very strongly disagree*.

2.4.3.3 *Crime types.* Jackson (2005) demonstrated that attitudes about fear of crime are distinct in terms of crime type (i.e., fear of property crime is a different kind of fear than fear of personal crime). Therefore, the current study asked participants about their fear of crime across five crime types: (a) being attacked by a stranger in the street (*attack*); (b) being robbed or mugged in the street (*mugging*); (c) being harassed, threatened or verbally abused in the street (*harassment*); (d) having someone break into your home whilst the inhabitants were there (*burglary in*); and (e) having someone break in to your home whilst the inhabitants were away (*burglary out*). Each dimension of fear of crime is assessed across these five crime types.

2.4.3.4 *Data Analyses.* The current investigation uses confirmatory factor analysis (CFA) and structural equation modeling (SEM) to achieve the four research objectives described in Section 3. CFA and SEM are consistent with the approaches used by Jackson (2004a; 2005). Furthermore, they are appropriate analytic techniques for the current study
because they test whether measures of a construct are consistent with our understanding of the nature of that construct. As first described by Jöreskog (1969), CFA simply tests whether the observed data fits a hypothesised measurement model (see Figure 1).

2.5 Results

Jackson (2005) began by testing the validity and reliability of worry, likelihood, consequences, control, and belief by determining whether five indicators of these constructs had good scaling properties and whether they were multi-dimensional (i.e., whether they grouped together by crime type). The current study follows the same approach.

2.5.1 Scaling properties of fear constructs. In order to test the scaling properties of the fear-of-crime indicators in an Australian context, confirmatory factor analysis (CFA) was used to evaluate two models for each construct. First, a one-factor model was estimated. In this model, property crime indicators and personal crime indicators were combined. Next, the property crime indicators were considered separate from the crimes against persons indicators, which allowed for a two-factor model to be estimated for each construct. Results of the one- and two-factor solutions for each fear construct are presented in Table 2.
Table 2.
Fit statistics for one- and two-factor confirmatory factor analysis solutions for each of the five indicators of fear

<table>
<thead>
<tr>
<th>Indicator/Solution</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>CFI</th>
<th>NFI</th>
<th>TLI</th>
<th>BIC&lt;sup&gt;a&lt;/sup&gt;</th>
<th>$\Delta$ BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>310.46</td>
<td>5</td>
<td>&lt; .001</td>
<td>.82</td>
<td>.82</td>
<td>.65</td>
<td>376.07</td>
<td></td>
</tr>
<tr>
<td>Two factor</td>
<td>12.42</td>
<td>4</td>
<td>.01</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>84.60</td>
<td>291.46</td>
</tr>
<tr>
<td>Likelihood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>305.23</td>
<td>5</td>
<td>&lt; .001</td>
<td>.88</td>
<td>.88</td>
<td>.77</td>
<td>370.81</td>
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<tr>
<td>Two factor</td>
<td>17.44</td>
<td>4</td>
<td>&lt; .001</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>89.58</td>
<td>281.23</td>
</tr>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>150.73</td>
<td>5</td>
<td>&lt; .001</td>
<td>.96</td>
<td>.96</td>
<td>.92</td>
<td>216.37</td>
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</tr>
<tr>
<td>Two factor</td>
<td>50.81</td>
<td>4</td>
<td>&lt; .001</td>
<td>.99</td>
<td>.99</td>
<td>.97</td>
<td>123.01</td>
<td>93.36</td>
</tr>
<tr>
<td>Control</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>342.84</td>
<td>5</td>
<td>&lt; .001</td>
<td>.88</td>
<td>.88</td>
<td>.77</td>
<td>408.40</td>
<td></td>
</tr>
<tr>
<td>Two factor</td>
<td>42.35</td>
<td>4</td>
<td>&lt; .001</td>
<td>.99</td>
<td>.99</td>
<td>.97</td>
<td>114.47</td>
<td>293.93</td>
</tr>
<tr>
<td>Belief</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>307.88</td>
<td>5</td>
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</tr>
<tr>
<td>Two factor</td>
<td>64.89</td>
<td>4</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.97</td>
<td>.94</td>
<td>136.79</td>
<td>236.63</td>
</tr>
</tbody>
</table>

<sup>a</sup>A difference in BIC of 10 corresponds to the odds being 150:1 that the model with the more negative value is the better model and is considered “very strong” evidence in favour of the model with the more negative BIC value (see Raftery, 1995).

Exact fit statistics for both the one- and two-factor solutions indicate that neither fit the data well, regardless of which construct is considered. However, since chi-square statistics are sensitive to large sample sizes, relative fit statistics were estimated. These show that two-factor solutions are statistically better than one-factor solutions for all five constructs. For example, the relative fit of a two-factor solution for worry is very good, based on the TLI (.99), NFI (.99), and the CFI (.99). Conversely, a one-factor solution does not fit the data very well (TLI = .65; NFI = .82; CFI = .82). Overall, the two-factor solution for worry is a significant improvement over the one-factor solution ($\Delta$BIC = 291.46)<sup>3</sup>.

A similar pattern is observed for the other four fear constructs. A two-factor solution consistently demonstrates a significant improvement over a one-factor solution: likelihood ($\Delta$ BIC = 281.23), consequences ($\Delta$BIC = 93.36), control ($\Delta$BIC = 293.93), and belief ($\Delta$BIC = 236.63).
The reliability and validity of each construct is also good. For example, Figure 2 shows the two-factor solution for consequences and indicates that the standardised factor loadings all exceed .81 and all R² values are above .66. For the two-factor solutions estimated for the other constructs, the standardized factor loadings are all above .72 and R² values are above .52. Both exceed established thresholds for good reliability and validity (Fornell & Larcker, 1981).

![Diagram showing two-factor solution for consequences of crime]

Figure 2. A two factor solution for consequences of crime.

### 2.5.2 Distinctiveness of indicators

The next objective was to determine whether the five indicators of fear are empirically distinct. Following Jackson’s (2005) approach, three models were estimated in order to accomplish this task: (a) a five-factor solution where each construct is modelled separately; (b) a four-factor model that considers worry and likelihood together; and (c) a three-factor model that combines likelihood, control, and consequences. The second and third models consider whether residents’ attitudes towards worrying about victimisation and the likelihood of being victimised are essentially the same.
and whether perceptions of threat can be represented by a single construct, respectively. In light of results presented in Section 4.1, solutions were estimated separately for property crimes and personal crimes. Results for each solution, by crime type, are presented in Table 3.

Table 3. 
Fit statistics for three-, four-, and five-factor solutions for worry, risk perception, and beliefs about crime by crime type

<table>
<thead>
<tr>
<th>Crime type/Solution</th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>CFI</th>
<th>NFI</th>
<th>TLI</th>
<th>BIC$^a$</th>
<th>$\Delta$ BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal crime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five</td>
<td>275.09</td>
<td>80</td>
<td>&lt; .001</td>
<td>.98</td>
<td>.97</td>
<td>.97</td>
<td>536.67</td>
<td>-</td>
</tr>
<tr>
<td>Four</td>
<td>1148.36</td>
<td>84</td>
<td>&lt; .001</td>
<td>.88</td>
<td>.87</td>
<td>.85</td>
<td>1383.78</td>
<td>847.11</td>
</tr>
<tr>
<td>Three</td>
<td>4003.27</td>
<td>87</td>
<td>&lt; .001</td>
<td>.56</td>
<td>.55</td>
<td>.47</td>
<td>4219.08</td>
<td>2835.30</td>
</tr>
<tr>
<td>Property crime</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five</td>
<td>198.23</td>
<td>26</td>
<td>&lt; .001</td>
<td>.95</td>
<td>.94</td>
<td>.91</td>
<td>387.88</td>
<td>-</td>
</tr>
<tr>
<td>Four</td>
<td>423.06</td>
<td>30</td>
<td>&lt; .001</td>
<td>.88</td>
<td>.87</td>
<td>.82</td>
<td>586.55</td>
<td>198.67</td>
</tr>
<tr>
<td>Three</td>
<td>1705.27</td>
<td>32</td>
<td>&lt; .001</td>
<td>.49</td>
<td>.49</td>
<td>.29</td>
<td>1855.68</td>
<td>1269.13</td>
</tr>
</tbody>
</table>

$^a$A difference in BIC of 10 corresponds to the odds being 150:1 that the model with the more negative value is the better model and is considered “very strong” evidence in favour of the model with the more negative BIC value (see Raftery, 1995).

For both personal crime and property crime models, the relative fit of a five-factor solution is a significant improvement over both the four- and the three-factor solutions. For example, the relative fit of the five-factor solution for the personal crime model is very good, based on the TLI (.97), NFI (.97), and the CFI (.98); and data fit the model better than the four-factor alternative (BIC = 536.67 vs. BIC = 1383.78). Standardised factor loadings for the five-factor solution exceed .75 and all $R^2$ values are above .56.

Similar results are observed for perceptions of property crime. The relative fit of a five-factor solution is good, based on the TLI (.91), NFI (.94), and CFI (.95). Furthermore, data fit the five-factor solution significantly better than the four-factor alternative (BIC = 387.88 vs. BIC = 586.55). Standardised factor loadings for the five-factor solution exceed .77 and all $R^2$ values are above .60.
2.5.2 Perceptions of neighbourhoods. Next, the scaling properties of residents’ perceptions of neighbourhoods were examined to determine whether they are consistent with Jackson’s model (see Figure 1). Two models for neighbourhood incivility were estimated, followed by two models for social cohesion. For neighbourhood incivility, perceptions towards physical and social cues were examined in order to determine whether they are distinct. Similarly, social cohesion is examined to assess whether trust/social capital is viewed differently than informal social control in an Australian context. Results of these analyses are presented in Table 4.

Table 4. 
Fit statistics for one- and two-factor confirmatory factor analysis solutions for neighbourhood incivility and social cohesion

<table>
<thead>
<tr>
<th>Indicator/Model</th>
<th>χ²</th>
<th>df</th>
<th>p</th>
<th>CFI</th>
<th>NFI</th>
<th>TLI</th>
<th>BIC⁹</th>
<th>Δ BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incivility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>97.87</td>
<td>14</td>
<td>&lt; .001</td>
<td>.96</td>
<td>.96</td>
<td>.94</td>
<td>189.73</td>
<td></td>
</tr>
<tr>
<td>Two factor</td>
<td>86.81</td>
<td>13</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.96</td>
<td>.94</td>
<td>185.22</td>
<td>4.51</td>
</tr>
<tr>
<td>Social cohesion</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>One factor</td>
<td>117.51</td>
<td>14</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.97</td>
<td>.95</td>
<td>209.34</td>
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<tr>
<td>Two factor</td>
<td>35.72</td>
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<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>134.11</td>
<td>75.23</td>
</tr>
</tbody>
</table>

⁹ A difference in BIC of 10 corresponds to the odds being 150:1 that the model with the more negative value is the better model and is considered “very strong” evidence in favour of the model with the more negative BIC value (see Raftery, 1995).

Relative fit statistics for both models show that the two-factor solutions are statistically better than one-factor solutions. Specifically, the relative fit of a two-factor solution for incivility is very good, based on the TLI (.95), NFI (.96), and CFI (.97). Although the one-factor solution is also a reasonable fit (TLI = .94; NFI = .96; CFI = .96), the two-factor solution for incivility is an improvement over the one-factor solution (ΔBIC = 4.51). In terms of the validity and reliability of individual items, all but three have loadings above .76 and an $R^2$ value of above .58. The exceptions are “dangerous dogs / irresponsible owners,” “not enough things for young people to do,” and “rubbish or litter lying around.”
A similar pattern is observed for the social cohesion model: a two-factor solution demonstrates a significant improvement over a one-factor solution ($\Delta$BIC = 75.23). For the two-factor social cohesion solution, all but one of the standardized factor loadings (i.e., locals will “tell off” youths causing problems) is above .71 and the $R^2$ values are above .50.

2.5.3 Structural models of victimisation worry. CFA results in previous sections establish that the five dimensions of Jackson’s model have reasonable scaling properties, based on a sample of Australians living in southeast Queensland. This suggests that people think about crime in reference to five unique dimensions of victimisation worry (i.e., worry, likelihood, consequences, control, and belief). The previous sections also indicate that residents think differently about types of crime (i.e., personal and property). The final analysis consists of testing Jackson’s structural path model, which is estimated using the two crime-type indicators. These models were estimated to determine the degree of association between the specified paths in Jackson’s (2005) model and the overall fit of the statistical models. The same statistical procedure used by Jackson (2004a) was adopted for the current structural models.$^4$. Statistical associations between each path in the models are displayed in Table 5.

Table 5. Regression weights and standardised values for each path of victimisation worry, dichotomised by crime type, using structural equation modeling.
Table 5 (Continued).
Regression weights and standardised values for each path of victimisation worry, dichotomised by crime type, using structural equation modeling

<table>
<thead>
<tr>
<th>Path from/to</th>
<th>Personal Victimisation</th>
<th>Property Victimisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
</tr>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.16</td>
<td>.03</td>
</tr>
<tr>
<td>Worry</td>
<td>.05</td>
<td>.03</td>
</tr>
<tr>
<td>Likelihood</td>
<td>.42</td>
<td>.04</td>
</tr>
<tr>
<td>Worry</td>
<td>-.09</td>
<td>.03</td>
</tr>
<tr>
<td>Control</td>
<td>-.01</td>
<td>.03</td>
</tr>
</tbody>
</table>

Structural equation models of personal crime victimisation worry (GFI = .98; CFI = .93; NFI = .92; TLI = .84) and property crime victimisation worry (GFI = .98; CFI = .93; NFI = .92; TLI = .83) fit the data appropriately, based on absolute and approximate fit statistics.\(^5\)

Furthermore, results from separate models for both crime categories that were considered are consistent in terms of significant predicted relationships between the two neighbourhood conditions and the five dimensions of crime fear illustrated in Figure 1.

For example, in both crime-type models the impact of perceived neighbourhood incivility on (a) perceptions of social cohesion, (b) beliefs about crime, (c) attitudes towards the likelihood of victimisation, and (d) the frequency of worrying about victimisation is significant and in the hypothesised directions. Similar consistencies across both models are observed for the relationships between (a) views towards the likelihood of victimisation and the frequency of worrying about victimisation and (b) attitudes about ones ability to control criminal victimisation and thoughts about the likelihood of being victimised.

Another noteworthy finding is the non-significant relationship between both the perceived consequences of personal victimisation and the frequency with which residents worried about personal victimisation \((b = .05, p = .12)\). A similar non-significant relationship between control and worry is observed in the personal crime model \((b = -.01, p = .88)\). These findings are noteworthy because they are in contrast to the hypothesised relationships in
Jackson’s original model (2005). Overall, however, results from both models indicate that appraisal of threat posed by specific types of crime in the local environment are heavily influenced by perceptions of the likelihood of a criminal event occurring.

2.6 Discussion

Four research questions guided the current study, replicating Jackson’s (2005) test of a social-psychological structural model of crime fear, which he developed from data collected in the UK. Using a sample of Australians living in southeast Queensland, the current study demonstrates that the five indicators (i.e., one for five different types of crime) of five latent variables (i.e., worry, victimisation, consequences, control, and belief) have good scaling properties. Furthermore, indicators used in the current study group into two separate, but related domains. That is to say, for all five fear constructs, respondents feel differently about property crime (e.g., burglaries) than they do about crimes against persons (e.g., personal robbery and public harassment).

Findings from the current study are consistent with Jackson’s observations using data from two UK neighbourhoods. Moreover, they provide additional evidence that traditional approaches to measuring “fear of crime” (e.g., surveys that use a single-item question like, “How safe do you feel walking alone in your neighbourhood at night) are inadequate because they fail to identify the specific “thing” (i.e., type of crime) that respondents are supposed to consider when judging how safe they feel.

Next, the current investigation determined that each construct considered represents a distinct dimension of fear. Again, these findings support those observed by Jackson (2005). Although solutions that considered constructs together (e.g., worry and likelihood as well as likelihood, control and consequences) fit the data, five-factor solutions for perceptions of both property and personal crime outperformed alternative solutions that were estimated. This means that respondents view each fear construct differently and reaffirms the evidence
that suggests measures of crime fear must consider the multi-dimensional nature of risk perception and threat assessment. Most traditional approaches to measuring fear of crime do not consider this aspect of measurement and therefore produce information about public perceptions that is extremely limited.

Additionally, findings from the current study reveal that attitudes about neighbourhoods are also consistent with Jackson’s process model. Both physical and social cues about neighbourhood incivility, for example, are viewed differently by respondents. Similarly, trust/social capital is different than informal social control. Although cross-sectional data like those used in the current study are not designed to test process models, current findings suggest that in the context of a “feedback loop,” perceptions of incivility and social cohesion are multi-dimensional constructs that may influence attitudes about crime.

Finally, findings from the current study reveal unique associations between five dimensions of victimisation worry and perceptions of social and physical environment. Specifically, structural models estimated for both worry about personal and property victimisation suggest that perceptions of the physical environment (i.e., incivility and disorder) exert a significant negative influence on the dimensions of victimisation worry. That is to say, when Australian residents see visual cues of disorder within their local environment, the frequency with which they worry about both personal and property crime victimisation also increases—along with other important dimensions of Jackson’s model, such as the likelihood of victimisation.

Collectively, results produced from the structural models in the current study are mostly consistent with Jackson’s hypothesised mediational paths (2004a; 2005). However, it is important to note that both estimated models suggest that the appraisal of threat associated with crime differs from Jackson’s hypothesised relationships. For example, in both crime-type models, we found that perception of control did not predict frequency of worry about
personal or property victimisation. This may indicate that when residents think about crime in their local environments, perceived levels of control over potential victimisations does not influence perceptions of fear and worry, in contrast to Jackson’s original hypothesis.

2.6.1 Limitations. It is important to note that certain limitations of the current study place restrictions on some of the substantive conclusions noted previously. First, data were obtained from a random sample of residents living in one Local Government Area (i.e., Gold Coast) in one Australian state (i.e., Queensland). Therefore, they are not generalizable to the overall Australian population. Although Jackson (2005) has called for additional research to test process models of fear using nationally-representative data, the current sample was sufficiently large ($N = 713$) to assess his model in an Australian context. This particular aspect of the current study, in and of itself, is a step forward in improving our empirical understanding of risk perception; nevertheless, current results cannot be generalised to the broader Australian population.

Second, Jackson’s (2005) structural model of crime fear is a process model (see Figure 1). Therefore, time series data is needed in order to accurately gauge how subjective assessments of risk are affected by changes in neighbourhood conditions. Since the current data are cross sectional, this type of assessment cannot be made. Jackson noted this shortcoming in his study and the same limitation characterises data used in the current investigation.

Third, although Jackson (2005) tested his model across groups (i.e., gender and neighbourhoods) similar comparisons were not made herein. Therefore, group invariance with respect to risk perception is not assessed. Furthermore, measures of intensity of worry were not measured; however, such measures were not included in Jackson’s original model.

Finally, measures of worry are based on past perceptions, while measures of risk perception (i.e., victimisation, consequences, control, and belief) focused on the present or
future. This could create a cognitive disconnect in the attitudes about crime. Again, this is an aspect of the current study that was shared by Jackson’s (2005) original test.

2.6.2 Conclusions and recommendations. Despite these limitations, current findings suggest several implications for future research as well as recommendations for practitioners. For future research, results of the current study confirm Jackson’s (2005) findings from the UK that fear of crime is “shaped by a range of subjective interpretations of the social meaning of crime and incivility embedded in the local context…” (p. 309). Additional empirical research is therefore needed to better understand the process involved in interpreting the social meaning of crime, the responses to these interpretations, and the subsequent effect that this has on subjective attitudes towards crime. In other words, future research is needed that focuses on the underlying processes of Jackson’s process model. Additionally, replications of this/Jackson’s study that use data collected in other countries and/or at the national level are also warranted.

For practitioners, current findings should underscore the need to think carefully about how we seek answers to the “fear of crime” question. For example, when communities are surveyed about their subjective perceptions of crime, fear should not be measured with a single survey item. Instead, questions should be designed to measure a particular dimension of fear (e.g., worry, victimisation, consequences, control, and/or belief). When doing so, respondents should be provided a specific temporal frame of reference when asked to think about risk assessment. They should also be provided with specific guidelines for defining neighbourhood. Furthermore, questions about fear of crime that are contained on surveys should be crime-type specific, as current findings demonstrate that personal crime and property crime reflect distinct domains of fear. Unless fear-of-crime surveys are designed to tap into the complexities of risk perception formation, data they produce will be of little utility.
ENDNOTES

1 Jackson (2013) recently used nationally-representative samples of Italians, Bulgarians, and Lithuanians to test extensions of the risk sensitivity and fear of crime model (Jackson, 2011; Warr, 1987). Although confirmatory factor analysis was used to identify solutions that best fit the data, the theoretical models tested included a construct not considered in his 2005 model (i.e., cognitive closure) and excluded one that was (i.e., belief).

2 The Gold Coast is located in southeast Queensland, Australia. It is the second most populous city in the states, with approximately 600,000 residents. The Gold Coast covers about 415 km².

3 The BIC is appropriate to report for non-nested models, and when the models tested have the same number of observed variables (see Byrne, 2013; Raftery, 1993). The smallest BIC value overall represents the best fit of the hypothesised model.

4 Guided by Jackson (2004a) factor scores were created using MLE and the regression method in IBM SPSS 22.0.

5 Because Kenny, Kaniska, and McCoach (2011) caution that indices such as the RMSEA may be problematic and misleading when estimated models have small degrees of freedom, such as the current model, fit statistics exclude the RMSEA. Instead alternative indices of absolute and approximate/relative fit (e.g., GFI, NFI, TLI) are presented (Kenny et al., 2011).
Appendix

Responses to questions about “worry” were measured on a 4-point scale, where 1 = Never in the past month, 2 = 1-2 times in the past month, 3 = 1-2 times in the past week, and 4 = Every day in the past week. The “victimisation” indicator was measured on a 7-point scale, with only the endpoints labelled: 1 = Definitely not going to happen and 7 = definitely going to happen. Both the “consequences” and “control” indicators were measured on a 7-point scale. Similar to the “victimisation” indicator, only the endpoints were labelled: 1 = Not at all and 7 = A very great extent. Finally, the “belief” measure used a 4-point scale, where 1 = Never in the next month, 2 = 1-2 times in the next month, 3 = 1-2 times in the next week, and 4 = Every day in the next week.
2.8 References


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2.9 Chapter Summary

Chapter 2 contained results from Study 1 of the current dissertation. Results were reported in a published manuscript that re-examined contemporary social-psychological indicators of fear of crime, using data collected from a self-administered survey of residents living on the Gold Coast, Australia, in 2014. Analysis of these data answer research question one: *Are established measures of fear of crime and risk perception reliable and valid when administered in Australia?* Results in Chapter 2 indicate that an established model consisting of measures of victimisation worry can be replicated in Australia, and that the core dimensions of this victimisation worry model: *worry, likelihood, consequences, control* and *belief* all have good scaling properties when measured using a sample of Australians.

Additionally, all paths in the model of victimisation worry are in the hypothesised directions (see Table 5 in Chapter 2). These findings provide support for the cross-cultural validity of the model and measures, which has until now, only been tested within European contexts (Jackson, 2009).

The first manuscript shows support for using models of victimisation worry to understand reactions to crime in Australian samples. The next two manuscripts demonstrate how this model can be used to better understand issues related to fear of crime (i.e., gender differences and the effect of knowing about crime prevention programs). In doing so, research question two can be answered: *What new knowledge can be produced in relation to particular questions about fear of crime when applying an established model of victimisation worry?*
CHAPTER 3: CRIME PREVENTION AND REDUCTION PROGRAMS: HOW DOES KNOWING ABOUT COMMUNITY INITIATIVES MODERATE ATTITUDE TOWARDS CRIMINAL VICTIMISATION?

This chapter includes a co-authored manuscript. The bibliographic details of the co-authored paper, including all authors, are:


My contribution to the manuscript involved:

As first author of the current manuscript I assisted in the recruitment of participants for the 2017 Gold Coast Community Survey, acquisition of data, all subsequent data cleaning/screening and analyses of SEM and CFA models. I was responsible for writing all sections of the manuscript for initial review. I also responded to all reviewer comments and revisions under the supervision of Dr. Hart.

(Signed) ___________________________ (Date) 23rd February 2018
Michael Chataway (Corresponding Author)

(Countersigned) ___________________________ (Date) 23rd February 2018
Supervisor: Dr. Timothy C. Hart
3.1 Abstract

The current study examines the association between fear of crime and awareness of community programs designed to prevent or reduce crime and social disorder. Data were collected from a community survey of household residents living on the Gold Coast of Australia ($N = 713$). Results indicate that those reportedly aware of community initiatives fear property crime and crimes against persons differently than those reportedly unaware of them. For fear of personal victimisation, awareness of crime prevention programs within an area weakened relationships between a) perceptions of incivility and social cohesion, b) perceptions of the consequences of victimisation and likelihood of victimisation, and c) perceptions of the likelihood of victimisation and worry about personal crime. Findings are discussed in terms of their implications on future research, and strategies for developing crime prevention and fear reduction programs that maximise the positive effects on attitudes towards crime, while minimising their unintended consequences, are also offered.

Keywords. Crime Prevention; Fear of Crime; Policy; Fear Reduction
3.2 Introduction

Public safety and security is a paramount concern for local governments. To protect its residents, organisations and institutions from harm or threats to their well-being, government agencies develop community programs designed to prevent or reduce neighbourhood crime and to improve neighbourhood conditions that are correlated with it. Although evidence exists that suggests these initiatives can have a positive impact on communities and their residents, some studies show that they can also produce certain unintended consequences (Rosenbaum, 2006). If a campaign to “get tough on crime” is highly publicised, for example, fear of crime amongst community residents may become elevated because of an increased awareness of problems within the immediate area (Garofalo, 1981).

Increasingly, empirical studies have focused on the effectiveness of various intervention strategies aimed at reducing crime within vulnerable communities (Bowers & Johnson, 2003). However, Bowers and Johnson argue, “working within this paradigm has potentially limited the literature on ‘what works’ to ‘what works as a physical measure on the ground’” (2003; p. 1). In other words, assessments of effective interventions are often restricted by the inadequacies of measures used in the evaluation process and how we conceive the causal mechanisms that may underlie successful crime prevention approaches (Bowers & Johnson, 2003).

In response, scholars have urged researchers to consider the possible anticipatory benefits of crime prevention, and how awareness of these efforts may impact offending behaviour, prior to formally implementing them throughout communities (Bowers & Johnson, 2003; Homel, Nutley, Webb, & Tilley, 2004). Although some research suggests that awareness of crime prevention initiatives may have the ability to reduce offending prior to their implementation (Bowers & Johnson, 2003; Smith, Clarke, & Pease, 2002), few
contemporary studies have focused on the effect that awareness of crime prevention programs may have on individuals’ fear of crime and risk perception.

The current study responds to this shortcoming in the contemporary literature. Existing research demonstrates that fear of crime is a complex, multi-dimensional concept (Chataway & Hart, 2016; Jackson, 2005, 2013), but what is unclear is how relationships among the different dimensions of crime fear are affected by residents’ awareness of community crime-fighting programs. Understanding the moderating effect that awareness may have on the social-psychological process of victimisation worry makes a unique, empirical-based contribution to the existing fear-of-crime literature. In addition, findings from the current study provide guidance to public officials responsible for developing and administering crime-reduction strategies. Specifically, findings from the current study can help public officials implement more holistic, public crime-fighting campaigns that maximise their positive benefits, while minimising their unintended consequences.

3.3 Literature Review

Crime prevention efforts developed and implemented at the neighbourhood level tend to focus on either a) reducing the opportunity for crime by modifying the built environment, or b) alleviate social problems that are believed to be the “root” cause of it (Rosenbaum, 2006). Although the primary focus of these programs is to reduce the prevalence of criminal activity, they may also have a positive impact on perceptions of crime and levels of perceived risk of victimisation (Foster, 1995; Foster, Hooper, Knuiman, & Giles-Corti, 2016). However, existing research shows that programs designed to reduce crime may fail to consistently have a positive affect on public attitudes, and may even produce adverse consequences (Garofalo, 1981; Kerley & Benson, 2000; Lorenc, Petticrew, Whitehead, Neary, Clayton, Wright, Thomson, Cummings, Snowden, & Renton, 2013).
3.3.1 Modifications to the built environment and fear of crime. A popular approach to reducing crime and to increase the public’s sense of safety and security is to improve characteristics of the built environment. However, evidence that these efforts consistently reduce fear of crime is inconclusive (Farrington, 1997). For example, researchers have studied the relationship between improving neighbourhood street lighting and attitudes towards crime and have found that it does not consistently reduce the degree to which residents worry about crime, or the likelihood residents believe that they will be victimised (Atkins, Husain, & Storey, 1991; Painter & Farrington, 1997). Some empirical evidence exists that suggests improving lighting can significantly decrease the likelihood that residents feel crime is a problem in general and that women feel safer going out at night in particular (Painter & Farrington, 1999); nevertheless, collectively, evidence that improving street lighting consistently leads to a reduction in crime fear is mixed (Lornec et al., 2013).

Local governments have also increased the use of Closed Circuit Television (CCTV) networks in many communities because they increase “eyes on the street,” which is believed to help increase the public’s feelings about safety and security. These intentions have not always been fully realised, however. In one of the earliest studies to examine the association between CCTV usage and fear of crime, Musheno, Levine, and Palumbo (1978) found that they slightly increased fear of crime at night and did not affect fear of crime at all during the day. Although more recent studies suggest that people feel significantly less likely to worry about crime in neighbourhoods where CCTV systems are used (Gill, Bryan, & Allen, 2007), existing evidence that increasing their usage consistently has a positive effect on attitudes towards crime is unconvincing (Lornec et al., 2013).

Other crime prevention programs aimed at reducing fear of crime in public schools (Kaplan, Bickman, Pesce, & Szoc, 1978), public parks (Cohen, Golinelli, Williamson, Sehgal, Marsh, & McKenzie, 2009), and public bus stations (Palmer, Holin, & Caulfield,
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2005) have been undertaken by modifying the built environment. Each has shown relatively more promising results. For example, Palmer and colleagues (2005) found that community members reported a significant reduction in their perceived levels of overall crime and a decrease in their perceived likelihood of being victimised. Likewise, Cohen et al.’s (2009) findings indicated that park improvement efforts made community residents feel reportedly safer when using them. Although these studies suggest a positive association between crime reduction efforts through improving the built environment and attitudes towards crime, they are based on a simplistic conceptualisation of fear of crime—one that fails to acknowledge its multi-dimensional nature (Chataway & Hart, 2016; Jackson, 2005, 2013).

3.3.2 Efforts to improve informal social control. Some crime prevention initiatives are aimed at improving social conditions within neighbourhoods believed to be associated with crime and disorder. Existing research indicates that these efforts might also help to reduce fear of crime (Brunton-Smith & Sturgis, 2011). Specifically, perceptions of neighbourhood cohesion and incivility have been shown to be a significant predictor of fear of crime and perceived victimisation risk (Marzbali, Abdullar, Razak, & Tilaki, 2012; Perkins & Taylor, 1996), and some existing research suggests that crime prevention techniques that improve informal social control may have a positive effect on fear of crime (Foster, 1995; Foster et al., 2016). However, these relationships have not always been observed in the existing literature.

For example, findings based on data collected during the Hartford (Connecticut) Neighbourhood Crime Prevention Program (HNCPP)—one of the first comprehensive community crime prevention efforts designed to bolster informal social control, reduce crime, and increase a sense of safety and security—were mixed (Holland, Hartmann, Brown, & Wiles, 1979). An evaluation of the program one year after its implementation indicated that residents believed that the likelihood of becoming a residential burglary victim significantly
declined; but the rate at which residents worried about burglary victimisation did not change (Holland, et al., 1979). When the multiple indicators of fear used in the original evaluation were combined and used to gauge residents’ attitudes in a follow-up assessment of HNCPP two years later, significant reductions in both fear of residential burglary and in street robbery were observed (Fowler & Mangione, 1982).

In an evaluation of the Britain Safer Cities Program (BSCP)—a project designed to deal with a number of crime-related problems in large urban areas to reduce crime, fear of crime and to create a safe environment in which economic enterprise and community interactions could flourish—similar inconsistencies were observed (Ekblom, Law, & Sutton, 1996). Results of the BSCP evaluation indicated that the initiative reduced the incidence of burglary and property crime in targeted areas, but perceptions of worry only reduced in situations where action was perceived to be intensive in an area. When action was perceived to be low-level, worry about burglary increased. This may highlight the negative effect that low-level awareness of crime prevention programs within an area may have on perceptions of crime.

### 3.3.3 Fear reduction campaigns.

Some crime prevention campaigns are designed to educate the public about the objective risk of criminal victimisation. Evidence in the empirical literature suggests that an individuals’ actual risk of criminal victimisation is often inconsistent with their subjective or perceived risk (Hale, 1996). To address this disconnect, some crime prevention and reduction campaigns aim to increase the public’s knowledge about the actual extent of local crime, in order to alter misconceptions; and in turn, the perceived level of victimisation risk.

Although this strategy is intuitively appealing, empirical evidence that these campaigns have the desired effect has been mixed. For example, Lavrakas and colleagues (1983) found that while transmitting information about crime prevalence using police
newsletters changed people’s image of crime, it did not appear to affect attitudes towards crime. In a follow-up study, Lavrakas (1986) found that police newsletters did not influence the image of crime within an area, or fear of crime. However, a major difference between these two studies was how this information was disseminated to members of the public (Kuttschreuter & Wiegman, 1998). In the first study, information was provided to residents by personal handouts, whereas in the second study information was distributed by mail. The different methods used to make residents aware of the prevalence of crime could have contributed to the disparate findings.

In addition to providing residents with “real” local crime information aimed at challenging preconceived ideas about crime risk, other campaigns have focused on reducing fear of crime by implementing effective preventative behaviour. This strategy is based on the assumption that when people access information concerning effective preventative behaviour, it increases perceived self-efficacy (i.e., one’s perceived ability to perform a desired action or goal), which encourages the implementation of relevant preventative measures (Kuttschreuter & Wiegman, 1998). Again, empirical findings in relation to this method of fear reduction remain mixed (Lavrakas, 1986; Lavrakas et al., 1983), which suggests that in general publicity campaigns aimed at educating the public about criminal victimisation risk have had limited effectiveness (Barthe, 2006).

### 3.3.4 Measuring fear of crime

Crime prevention strategies at the local level may have both a positive and negative affect on public attitudes towards crime. They may adversely impact fear of crime by drawing residents’ attention to it, thereby making victimisation risk appear more salient and proximal (Grabosky, 2000; Rosenbaum, 1988). Conversely, prevention strategies may promote preventative action, thereby reducing public perceptions of victimisation risk (Homel, 2006). In order to be adversely (or positively) affected by local crime fighting programs, it makes sense that a resident must first be aware
of government efforts underway. In addition, the way in which fear of crime is measured can also impact conclusions made about whether programs achieve their intended outcomes, without producing unintended consequences (Kuttschreuter & Wiegman, 1998).

Scholars have considered the challenges associated with measuring fear of crime for decades and have identified specific methodological issues associated with studying it (Farrall, Bannister, Ditton, & Gilchrist, 1997; Warr, 2000). For example, fear of crime data is often collected using surveys, but questionnaires typically rely on a single item to measure fear (e.g., How safe do you feel while walking alone in your neighbourhood at night?). However, contemporary scholars have demonstrated that fear of crime involves a complex interplay of emotional, behavioural and cognitive responses to crime risk (Jackson, 2005).

Structural process models of crime fear also have been recently offered as alternatives to traditional measures of risk perception (Farrall et al., 1997; Jackson, 2004, 2006, 2009). These models emphasise the importance of the social and physical environment on perceptions of risk and worry about crime. Proponents of these models argue that fear of crime consists of worry associated with specific events, subjective risk perceptions and an assessment or interpretation of the social and physical environment in which people live (Jackson, 2005). For example, Jackson argues that an individual’s fear of crime is best represented by five unique dimensions: (a) beliefs about the incidence of crime; (b) perceived consequences of victimisation; (c) perceived likelihood of victimisation; (d) perceived control over crime; and (e) frequency of worry about crime (Jackson, 2004; Jackson & Gouseti, 2014).

In this model, the consequences of victimisation, perceived likelihood of victimisation and perceived level of control over crime represent an individual’s appraisal of threat (i.e., risk perception). Each dimension in the model is measured in reference to crime type (i.e., personal and property victimisation) and consideration is also given to perceptions of the
social environment (i.e., neighbourhood incivility and social cohesion) (Jackson 2005).

Figure 1 illustrates the hypothesised links—with directional associations represented by “+” or “-”—between latent variables in Jackson’s structural process model of crime fear. These paths are of particular importance to interpreting the relationship between risk perceptions, the social environment and emotion (i.e., worry).

*+/ - represent the hypothesised directions of relationships

**Figure 1.** Jackson’s (2005) Social Psychological Model of Victimisation Worry.

The scaling properties and reliability of Jackson’s five dimensions of victimisation worry have been assessed in many countries around the world, including the UK, Italy, Bulgaria and Lithuania (Jackson, 2005, 2013); and most recently, in Australia (Chataway & Hart, 2016). Collectively, these studies show that the five dimensions of worry, likelihood, consequences, control and beliefs are distinct factors of crime fear and have good scaling properties.

Contemporary social-psychological models of victimisation worry have yet to be used to gauge fear of crime as a function of awareness of local crime prevention initiatives. In doing so, researchers can have a better platform for determining the moderating influence of
awareness of crime prevention on the processes associated with fear of crime. The measurement of key constructs associated with fear of crime and risk perception may also assist with conclusions that are drawn about the effectiveness of crime prevention programs on reducing fear of crime.

For example, in the Hartford Neighbourhood Crime Prevention Program mentioned previously, residents believed that the likelihood of becoming a residential burglary victim significantly declined; but the rate at which residents worried about burglary victimisation did not change as a result of the programs implementation (Hollander, et al., 1979). This may suggest that crime prevention strategies may impact the various dimensions of crime fear differently, and thus warrants further investigation.

3.3.5 The current study. Community programs designed to reduce or prevent crime have been shown to affect perceptions of crime differently. In some cases fear of crime is successfully abated, but in other circumstances it remains unchanged or even increases. These contradictory findings pose an important question for policymakers and researchers alike. Simply put, how can crime prevention and reduction campaigns be designed and implemented so that their positive effects on attitudes towards crime are maximised, while unintended consequences are reduced?

A logical place to start in an attempt to answer this question is to examine whether simply being aware of local community crime prevention or reduction programs is associated with changes in residents’ perceptions of crime fear; and if it is, which specific dimensions of victimisation worry are affected, and how. The current study answers these questions by testing whether community awareness of crime prevention programs moderates the social-psychological processes of crime fear (i.e., risk perception formation, beliefs about the incidence of crime and frequency of worry about crime).
3.4 Methodology

Data used in the current study were collected during the 2014 Gold Coast Community Survey (GCCS), a self-administered mail survey of residents 18 years of age and older living on the Gold Coast of Southeast Queensland, Australia. Of the 2,354 randomly sampled households contacted and asked to participate, a total of 713 questionnaires were completed and returned. Demographic characteristics of GCCS participants are presented in Table 1 and show that the typical participant was a 56 year old Australian female who was currently married at the time of the survey and who had lived in her neighbourhood for approximately 10 years.

Table 1
Demographic Characteristics of GCCS Participants (N = 713)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
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<td>Gender</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>254</td>
<td>36.13</td>
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<tr>
<td>Female</td>
<td>449</td>
<td>63.87</td>
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<td>Australian Born</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>234</td>
<td>32.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>476</td>
<td>67.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently Married</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>209</td>
<td>29.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>492</td>
<td>70.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>692</td>
<td></td>
<td>18</td>
<td>93</td>
<td>56.02</td>
<td>15.93</td>
</tr>
<tr>
<td>Time at current residence (months)</td>
<td>691</td>
<td></td>
<td>1</td>
<td>1062</td>
<td>119.67</td>
<td>123.44</td>
</tr>
</tbody>
</table>

Note: Values under the percentage columns reflect the percentage of valid responses.

Currently married includes de facto marriage.

The current study utilises Jackson’s model depicted in Figure 1 to test our research hypotheses. Therefore, measures associated with perceptions of neighbourhoods and the five constructs associated with fear of crime were collected during the GCCS.

3.4.1 Neighbourhood characteristics. In order to assess perceptions of neighbourhood characteristics, seven questions were used to measure attitudes towards both physical and social incivility. Participants were asked how much a problem they felt the following conditions were in their neighbourhood: (a) vandalism/graffiti; (b) rubbish in the streets; (c) dogs out of control/creating a mess; (d) drug-taking in the open; (e) drinking in the
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street; (f) teenagers hanging around; and (g) not enough things for young people to do. On average, participants rated their neighbourhoods 3.07 out of 4.00 ($SD = 0.62$), where 1 indicates incivilities are “A very big problem” and 4 indicates that they are “Not a problem at all.”

Seven questions were also used to measure informal social control and social capital (i.e., social cohesion). Participants were asked how much they agreed with the following statements: (a) the people who live here can be relied upon to call the police if someone is acting suspiciously; (b) if any of the children or young people around here are causing trouble, local people will tell them off; (c) if I sensed trouble whilst in this area, I could raise attention from people who live here for help; (d) this area has a close, tight-knit community; (e) this area is a friendly place to live; (f) this area is a place where local people look after each other; and (g) most people who live in this area trust one another. Using a 5-point scale where 1 corresponds to “Very strongly agree” and 5 corresponds to “Very strongly disagree,” on average, participants indicated that the area in which they lived is somewhat socially cohesive ($M = 2.37; SD = 0.89$).

3.4.2 Dimensions of crime fear. The five dimensions of fear depicted in Figure 1 (i.e., worry, likelihood, consequences, control and belief) were also measured during the GCCS. Worry was measured using a 4-item response set where 1 indicates “Not once in the last month” and 4 corresponds to “Everyday” ($M = 1.38; SD = 0.51$). Likelihood of victimisation was measured on a 7-point scale, where only the endpoints were labeled: 1 = “Definitely not going to happen” and 7 = “Certain to happen” ($M = 2.36; SD = 1.12$).

Participants’ attitudes about the consequences of criminal victimisation were also measured on a 7-point scale, with only the endpoints labeled: 1 = “Not at all” and 7 = “To a very great extent” ($M = 5.45; SD = 1.54$). Using the same 7-point scale, GCCS participants’ were asked about the extent to which they had control over becoming a crime victim ($M = 3.70; SD =$
1.62). Finally, participants in the GCCS were asked how often they believe that crime would occur in their neighbourhood during the next month (i.e., belief). A 4-point scale that ranges from 1 “Never in the next month” to 4 “Every day in the next week” was used to measure this dimension of fear (\(M = 1.75; \quad SD = 0.63\)).

3.4.3 Crime types. Questions about the five dimensions of fear were asked in the context of a specific crime. For the models that follow, consideration was given to both personal and property offenses. Incidents of personal victimisation include (a) being attacked by a stranger in the street; (b) being robbed or mugged in the street; and (c) being harassed, threatened or verbally abused in the street. Property victimisations considered in the GCCS include (a) having someone break into a resident’s home whilst they are there; and (b) having someone break into a resident’s home whilst they are away.

3.4.4 Awareness of community programs. Finally, participants were asked whether they were aware of Gold Coast City Council (GCCC, 2014) programs designed to reduce crime and/or increase perceptions of public safety. These questions in relation to awareness of crime prevention programs were asked after questions measuring the five dimensions of crime fear.

Programs that were underway at the time of the survey included: (a) The GCCC Business Safety Program—which provides licensed business owners with a detailed fact sheet outlining a range of crime prevention strategies for small businesses; (b) The Graffiti Prevention Education Program—which is designed to educate students enrolled in primary and secondary education about the consequential impacts of graffiti; (c) Car Theft Prevention Program—which aims to provide information and links to car safe resources on the GCCC website, including information on how to prevent vehicle theft in the community, along with essential contact numbers and services for community residents; (d) Get Home Safely Program—which aims to provide information about late-night public transportation options
from entertainment districts located on the Gold Coast; (e) *Party Safe Program*—which encourages residents to report major parties to the Queensland Police Service through the Party Safe registration form; (f) *Good Sports Program*—which is designed to assist clubs with the responsible management of alcohol through an accreditation process requiring clubs to implement a variety of practices and policies within GCCC guidelines; and (g) *Women’s Safety/Information Card*—which provides essential information on services for women such as domestic abuse hotlines, women’s shelters, sexual health clinics, and emergency services phone numbers. About half of all participants were reportedly aware of at least one initiative and about half are not aware of any of them at the time of the survey.

### 3.4.5 Analytic strategy

A series of Multigroup Structural Equation Models (SEMs) were estimated to test whether awareness of community crime reduction or prevention programs moderated Jackson’s five social-psychological dimensions of victimisation worry and risk perception. Models were estimated using IBM SPSS and Analysis of Moment Structures (AMOS, 2011)\(^3\). These statistical approaches enabled the researchers to specify, estimate, assess and present models to show hypothesised relationships among variables (Kline, 2011; Ullman, 2007; Western & Gore, Jr., 2006).

SEM was used in the current analysis as it allows for simultaneous analysis of all variables within a specific model and is useful for analysing both direct and indirect effects (Karimimalayer & Anuar, 2012). This makes SEM a powerful strategy in comparison to first generation multivariate techniques, such as multiple regression. For example, multiple regression, does not allow for an assessment of all variables simultaneously, instead it analyses each variable separately (Karimimalayer & Anuar, 2012). Another advantage of SEM over the more common regression techniques is that measurement error is not accumulated in a residual error term, and that a number of model performance statistics can be estimated and assessed according to best practice guidelines (Karimimalayer & Anuar,
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2012). Additionally, multigroup SEM strategies have been regarded as a viable statistical strategy for comparing groups in relation to theoretical constructs contained in structural process models (Ullman, 2007).

3.5 Results

Do residents who are reportedly aware of community crime reduction or prevention programs fear crime differently than those who are reportedly unaware of them? The first step in answering this question was to examine whether the GCCS data fit a social-psychological process model of crime worry (i.e., Figure 1) similarly for both groups.

3.5.1 Fear of crime and awareness of community programs. Table 2 provides fit statistics for personal and property crime models, grouped by participants’ awareness status. For crimes against persons, data fit both models satisfactorily; but they fit the model for residents who said they were aware of community programs better than the model for those who were unaware (BIC = 141.72 vs. BIC = 145.80). However, the relative fit of the data for the “aware” model was only moderately better than for the “unaware” model (∆BIC = 4.08).

Table 2 Structural Equation Model (SEM) Fit Statistics for Individuals Reportedly Aware/Unaware of Crime Prevention Programs, by Crime Type

<table>
<thead>
<tr>
<th>Model</th>
<th>n</th>
<th>df</th>
<th>χ²</th>
<th>p</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
<th>BIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Crime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>348</td>
<td>9</td>
<td>30.53</td>
<td>&lt; .001</td>
<td>.98</td>
<td>.93</td>
<td>.92</td>
<td>.94</td>
<td>141.72</td>
</tr>
<tr>
<td>Unaware</td>
<td>334</td>
<td>9</td>
<td>35.39</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.93</td>
<td>.92</td>
<td>.94</td>
<td>145.80</td>
</tr>
<tr>
<td>Property Crime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>347</td>
<td>9</td>
<td>46.04</td>
<td>&lt; .001</td>
<td>.96</td>
<td>.89</td>
<td>.88</td>
<td>.90</td>
<td>157.45</td>
</tr>
<tr>
<td>Unaware</td>
<td>333</td>
<td>9</td>
<td>29.03</td>
<td>&lt; .001</td>
<td>.98</td>
<td>.95</td>
<td>.93</td>
<td>.95</td>
<td>139.38</td>
</tr>
</tbody>
</table>

Note. Differences in the number of cases belonging to each “grouping” variable ran for multigroup SEM are due to the exclusion of missing data from the total sample (N = 713).

The opposite pattern was observed when perceptions of property crimes were considered. Again, model fit indices suggested that the data fit both models satisfactorily. However, the GCCS data fit the “unaware” model better than the “aware” model (BIC =
139.38 vs. BIC = 157.45). The relative fit of the data was much better for those who indicated they were unaware of Council’s programs designed to prevent and/or reduce criminal offending (ΔBIC = 18.07).

Collectively, information in Table 2 suggests two important findings. Firstly, social-psychological process models of victimisation worry are affected by whether neighbourhood residents are aware of community programs designed to prevent or reduce crime. Attitudes about crime are measurably different among those who are reportedly aware of local government efforts, compared to those who are reportedly unaware. Secondly, the effect that awareness has on the models’ ability to explain perceptions of victimisation worry differs once crime type is considered. Specifically, awareness of local crime prevention programs has a stronger influence on fear of personal victimisation. Given these results, direct effects of latent factors contained within each of the four models were assessed separately to better understand the specific ways in which awareness of crime prevention/reduction efforts by local government affects attitudes towards crime.

### 3.5.2 Fear of personal victimisation by awareness status

Tables 3 and 4 contain values associated with (a) the unstandardised and standardised coefficients for each direct path produced from the “aware” and “unaware” process models (see Figure 1); and (b) z-scores of the differences between the models’ regression coefficients (Brame, Paternoster, Mazerolle, & Piquero, 1998). Table 3 presents these results when data were limited to perceptions of crimes against persons, whereas Table 4 conveys this information for attitudes towards property victimisation.
Table 3
*Direct Effects Between Constructs Contained in the Perceptions of Personal Crime Models, by Awareness Status, and Differences in Path Coefficients (N = 682)*

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>Aware (A)</th>
<th>Unaware (U)</th>
<th>A-U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incivilities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.29</td>
<td>-.30 &lt; .001</td>
<td>-.43</td>
</tr>
<tr>
<td>Belief</td>
<td>.58</td>
<td>.60 &lt; .001</td>
<td>.57</td>
</tr>
<tr>
<td>Likelihood</td>
<td>.16</td>
<td>.18 &lt; .001</td>
<td>.14</td>
</tr>
<tr>
<td>Worry</td>
<td>.19</td>
<td>.21 &lt; .001</td>
<td>.15</td>
</tr>
<tr>
<td><strong>Cohesion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>-0.07</td>
<td>-0.08 .064</td>
<td>-0.09</td>
</tr>
<tr>
<td>Control</td>
<td>--</td>
<td>-- .477</td>
<td>.05</td>
</tr>
<tr>
<td><strong>Beliefs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.20</td>
<td>.21 &lt; .001</td>
<td>.26</td>
</tr>
<tr>
<td>Control</td>
<td>--</td>
<td>--</td>
<td>.05</td>
</tr>
<tr>
<td><strong>Consequences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.08</td>
<td>.09 .032</td>
<td>.23</td>
</tr>
<tr>
<td>Worry</td>
<td>.09</td>
<td>.10 .018</td>
<td>-.01</td>
</tr>
<tr>
<td><strong>Likelihood</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worry</td>
<td>.32</td>
<td>.32 &lt; .001</td>
<td>.50</td>
</tr>
<tr>
<td>Control</td>
<td>--</td>
<td>--</td>
<td>.05</td>
</tr>
</tbody>
</table>

-- Value less than .005.
*p < .05 (one-tailed test).

Table 4
*Direct Effects Between Constructs Contained in the Perceptions of Property Crime Models, by Awareness Status and Differences in Path Coefficients (N = 680)*

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>Aware (A)</th>
<th>Unaware (U)</th>
<th>A-U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incivilities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.29</td>
<td>-.31 &lt; .001</td>
<td>-.45</td>
</tr>
<tr>
<td>Belief</td>
<td>.49</td>
<td>.48 &lt; .001</td>
<td>.51</td>
</tr>
<tr>
<td>Likelihood</td>
<td>.17</td>
<td>.17 &lt; .001</td>
<td>.07</td>
</tr>
<tr>
<td>Worry</td>
<td>.10</td>
<td>.10 .013</td>
<td>.16</td>
</tr>
<tr>
<td><strong>Cohesion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>-.01</td>
<td>-.01 .434</td>
<td>-.11</td>
</tr>
<tr>
<td>Control</td>
<td>-.03</td>
<td>-.03 .288</td>
<td>.09</td>
</tr>
<tr>
<td><strong>Beliefs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.24</td>
<td>.25 &lt; .001</td>
<td>.28</td>
</tr>
</tbody>
</table>

-- Value less than .005.
*p < .05 (one-tailed test).

Table 4 Continued
Table 4 (Continued)

Direct Effects Between Constructs Contained in the Perceptions of Property Crime Models, by Awareness Status and Differences in Path Coefficients (N = 680)

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>Consequences</th>
<th>Likelihood</th>
<th>Worry</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aware (A)</td>
<td>Unaware (U)</td>
<td>A-U</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>β</td>
<td>p</td>
<td>b</td>
</tr>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.19</td>
<td>.20</td>
<td>&lt; .001</td>
<td>.20</td>
</tr>
<tr>
<td>Worry</td>
<td>.15</td>
<td>.16</td>
<td>&lt; .001</td>
<td>.11</td>
</tr>
<tr>
<td>Control</td>
<td>-.05</td>
<td>-.05</td>
<td>.171</td>
<td>-.09</td>
</tr>
<tr>
<td>Worry</td>
<td>-.01</td>
<td>--</td>
<td>.456</td>
<td>-01</td>
</tr>
</tbody>
</table>

-- Value less than .005.
*p < .05 (one-tailed test).

Table 3 contains several noteworthy findings. First, all but two of the relationships hypothesised in Figure 1 are supported in the “aware” model of personal crime victimisation, when tested at the $\alpha = .10$ level. The two exceptions were the cohesion-control ($b < .005, p = .477$) and control-worry ($b = .05, p = .121$) relationships. Second, except for the consequences-worry association ($b = -.01, p = .867$), the same significant paths that were observed in the “aware” model were also observed in the “unaware” model; again, in the hypothesised directions. Third, there was evidence that being aware of Council programs strengthened some attitudes towards personal victimisation, but it weakened most.

For example, the association between perceptions of control and worrying about personal crime was significantly stronger for those who were reportedly aware of Council programs, compared to those who were not ($z = 1.68, p = .046$). Conversely, awareness status weakened the observed relationships between (a) perceptions of the consequences of personal victimisation and the likelihood of being victimised ($z = -2.12, p = .013$); (b) the perceived likelihood of personal victimisation and crime worry ($z = -2.59, p = .004$); and (c) perceptions of neighbourhood incivilities and cohesion ($z = 1.94, p = .026$).

3.5.3 Fear of property victimisation and awareness status. In Table 4, regression coefficients of model pathways for the “aware” and “unaware” group models are presented
FEAR OF CRIME IN TIME AND PLACE

for perceptions of property crime victimisation, along with z-scores associated with the differences between them. Compared to the results presented in Table 3, analysis of the property crime data reveal that fewer paths for both the “aware” and “unaware” groups were statistically significant. Only one of the coefficients that were compared between the group models was significantly different. Namely, the negative association between perceived neighbourhood incivilities and cohesion was significantly weaker for the “aware” group, when compared to the “unaware” group ($z = 2.14, p = .016$).

3.6 Discussion

The primary focus of this study was to assess whether perceptions of crime are influenced by awareness of community crime prevention/reduction initiatives that are administered by local governments. Two particular outcomes of the current study speak directly to this research question and warrant further discussion.

Firstly, the association between awareness status and perceptions of crime varies depending on the type of criminal victimisation considered (i.e., personal versus property crime). We find that the community survey data used in the current study fit a social-psychological process model of crime worry better for those who are reportedly aware of programs designed to fight crime, compared to those who are reportedly unaware of them. This is only true, however, when participants are asked to reflect on crimes against persons. The opposite pattern emerges when considering perceptions of property crime.

Secondly, we find that certain dimensions of victimisation worry and risk perception may be moderated by an individual’s awareness of community crime-fighting efforts. Awareness status appears to strengthen associations between some dimensions of crime fear, while weakening the relationships between others; but most of these patterns are only observed in the personal crime model. A summary of the moderating affects that awareness status has on fear of crime and that are observed in the current study is presented in Table 5.
Table 5
A Summary of The Types of Moderating Affects That Increased Awareness of Council Crime Prevention/Reduction Programs Has on Dimensions of Crime Fear, by Crime Type

<table>
<thead>
<tr>
<th></th>
<th>Personal Crimes</th>
<th>Property Crimes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strengthened</td>
<td>Strengthened</td>
</tr>
<tr>
<td>Control → Worry</td>
<td>Incivility → Cohesion</td>
<td>None</td>
</tr>
<tr>
<td>Consequences → Likelihood</td>
<td></td>
<td>Incivility → Cohesion</td>
</tr>
<tr>
<td>Likelihood → Worry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All other paths between constructs contained in the social-psychological process model of crime fear that is depicted in Figure 1 are unaffected by awareness status.

The observed relationship between individuals’ perceptions of the consequences of being a personal crime victim and the perceived likelihood of being personally victimised, for example, is significantly weaker for those reportedly aware of Council programs, compared to those who are reportedly unaware of them (Table 5). A similar pattern between the likelihood and worry dimensions of crime fear is also observed in the two personal crime models (i.e., the aware and unaware model). However, awareness status fails to moderate either of these associations when individuals reflect on property crimes.

The current findings suggest that being aware of community crime prevention/reduction programs influences the way in which people fear crime; but it affects them differently, depending on the type of victimisation considered. Furthermore, a person’s awareness status does not affect all dimensions of fear—represented by Jackson’s (2005) social-psychological model—in the same way. For example, some paths in the model are strengthened, while others are weakened. Collectively, these results provide guidance for future fear of crime research and for local governments’ responses to crime problems.

In terms of future scholarly research, the current study does not address whether the relationships between awareness and fear are similar for those who participate in community programs or who modify their behaviour in response to them. Further research is needed to determine how active participation in community programs and/or reactions to them effect fear of crime. For example, future studies might test, specifically, whether behavioural
modification (e.g., changes in security measures, built environment, or guardianship) as a result of being aware of programs affects perceptions of crime (i.e., does it lead to hyper-vigilance and/or more anxieties about crime prevalence in the community).

In addition, the current study examines whether awareness of community crime prevention programs moderates residents’ perceptions of crime. Given that we identify that awareness status has a direct effect on certain dimensions of victimisation worry, future work could explore the possibility of creating a more robust social-psychological model of crime fear. This could include a model where awareness status is a potential mediator of crime fear. In doing so, we could advance our existing understanding of the various dimensions of fear of crime proposed by Jackson (2005) and the mediational effects between the various paths in his model.

In terms of program administration, our findings suggest that increasing awareness of local crime prevention programs affects public perceptions of crime risk (i.e., the perceived consequences of victimisation, the perceived likelihood of victimisation, and the perceived control over being victimised), but that relationships between the dimensions of risk perception are impacted differently. Therefore, targeted “messages” about particular aspects of crime risk should be integrated into local governments’ crime fighting initiatives in ways that could help reduce overall levels of crime fear. This approach would be consistent with recent research into fear of crime reduction strategies by focusing on particular elements that make up “typologies” of victimisation worry (i.e., the consequences of victimisation) (Hart, 2016).

For example, administrators should consider communicating—as part of their broader crime prevention/reduction strategies and campaigns—specific information about self-protection or avoidance measures that individuals can take to help prevent personal victimisation. In doing so, there could be an overall decrease in levels of personal crime
worry throughout the community, given that the control-worry relationship is stronger among those who are aware of crime reduction/prevention efforts. Campaigns/strategies that stress how victims of crime are supported by the community and/or local agencies when personal crime occurs and how the likelihood of experiencing personal victimisation is relatively low could also help to reduce overall levels of crime worry throughout a community, given the role that these two dimensions of risk play in the overall process of crime fear.

3.6.1 Limitations. Despite the contribution to existing fear of crime literature the current study makes and the guidance it provides to public administrators, it is not without certain limitations that must be acknowledged. For example, most fear of crime research relies on cross-sectional data—as did the current investigation. Therefore, a true understanding of the “process” by which attitudes towards crime are affected by increased awareness in crime prevention/reduction programs cannot be produced from the models used in the current study. This would require longitudinal data. As Rosenbaum (1988) notes, cross-sectional data do not easily allow for causal inferences. In this case, some of the differences in the models analysed may not be attributable solely to awareness of programs, but possibly pre-existing differences between groups.

For example, the gender bias evident in our sample may impact the inferences that we can draw about the relationship between awareness of crime prevention programs and fear of crime. Women are often found to be more fearful of crime than men, thus women may be more likely to express a greater fear of crime and level of perceived risk, despite being reportedly aware of existing crime prevention programs (Hale, 1996). Although, some research does suggest that the effect of gender on fear of crime appears to reduce with increasing age, this limitation of the current study should be addressed in future research (Cops & Pleysier, 2011). In future, researchers may wish to attempt to control for demographics when assessing the moderating influence of crime prevention awareness on
fear of crime. However, before doing so, it would be important to consider the possible issues that may arise as a result of attempting to control for a number demographic variables (i.e., gender, age, SES status) in an SEM model (e.g., convergence issues)\textsuperscript{6}.

Another limitation of the current study is the differences observed in model performance. These differences suggest that there is some group variation in Jackson’s (2005) original model of victimisation worry. Other external factors, which are not accounted for by the five dimensions in the model, may affect perceptions of crime in specific subgroups. Further refinements to the model used in the current study may reduce this effect (e.g., including measures of constrained/preventative behaviour).

Finally, the sample used in the current study was somewhat different from the general population of Gold Coast residents. Despite having a pool of potential respondents selected randomly from throughout the study area, those who returned completed questionnaires reflect an over-representation of women, older residents, and those reportedly married at the time of the survey. Although the limitations noted above restrict inferences that can be made about the relationship between fear of crime and awareness of community programs designed to address crime problems, they do not limit our conclusions about how agencies can develop empirically-based strategies for reducing fear of crime and specific aspects of risk perception when community programs are introduced.

\textbf{3.6.2 Conclusion.} In summary, our findings highlight some of the challenges facing public administrators responsible for the safety and security of community residents, particularly the effect that awareness of community crime prevention programs can have on public perceptions of crime and risk. When developing community programs designed to prevent/reduce crime, public administrators need to move beyond targeting just “perceptions of safety.” Rather, they must target the different ways people think about crime and disorder within local areas, including residents’ perceptions of risk and vulnerability posed by crime
and disorder. In doing so, administrators will minimise the chances that efforts designed to combat crime within local environments will do more harm than good.

ENDNOTES

1 The Gold Coast is located in Southeast Queensland, Australia. It is the second most populous city in the state, with approximately 537,844 residents (ABS, 2010). The Gold Coast covers about 1,379km².
2 For the analyses that follow both the incivility and the cohesion measures were reverse coded to more accurately reflect the hypothesised relationships between these and other constructs in Jackson’s Model (see Figure 1).
3 Due to the measurement of the variables of interest to the study, factor scores were created to enable model estimation with SEM. Factor scores were created using Maximum Likelihood Estimation (MLE) and the regression method. This is consistent with the approach used to originally assess Jackson’s model.
4 SEM using IBM AMOS cannot be performed with missing data; therefore, listwise deletion was used to exclude missing values from subsequent analyses. The revised number of cases belonging to each group (aware vs. unaware) can be found in Table 2 of the manuscript.
5 Because Kenny, Kaniska, and McCoach (2011) caution that indices such as the RMSEA may be problematic and misleading when estimated models have small degrees of freedom, such as the current models do, fit statistics exclude RMSEA, and instead rely on alternative indices of absolute and approximate fit (e.g., GFI, NFI, and IFI).
6 The authors note that media perceptions may also affect crime prevention awareness and key constructs within Jackson’s model. However, the intention of the present study was not to assess the processes by which participants became aware of crime prevention in their area, rather we were interested in whether awareness status moderates the relationship between processes defined in the tested model. The authors recognise that the processes by which people become aware of crime prevention through publicity may be a future avenue of research, but this was out of the scope of the current study.

Funding
The current study was not supported by grant funding from any public, commercial or not-for-profit organisation.
3.7 References


3.8 Chapter Summary

In Chapter 3, a published manuscript was presented using data collected from Study 1—the 2014 Gold Coast Community Survey. This manuscript builds upon the data collected and analysed in Chapter 2 of the dissertation where an established social-psychological process model and measures of fear of crime were validated using a sample of Australians. Specifically, Chapter 3 examines whether residents’ awareness of community crime prevention efforts underway in their neighbourhood influences the theoretical relationships between dimensions contained in the model of victimisation worry. The manuscript answers research question two: *What new knowledge can be produced in relation to particular questions about fear of crime when applying an established model of victimisation worry?*

Results presented in Chapter 3 indicate that Gold Coast residents’ awareness of community crime prevention efforts may influence some dimensions of crime fear proposed in the model. Furthermore, observed differences in the aware vs. unaware models are dependent on fear of specific types of crime. For example, the relationship between individuals’ perceptions of the consequences of being a personal crime victim and the perceived likelihood of being personally victimised is significantly weaker for those reportedly aware of Council programs, compared to those who are reportedly unaware of them. This new knowledge about the impact that awareness of community crime prevention has on attitudes towards crime was made possible by the application of the validated model in Chapter 2.

The next chapter (Chapter 4) presents another manuscript that further demonstrates how the application of the validated model in Chapter 2 can produce new knowledge, regarding an old topic—the gender-victimisation paradox. Specifically, data from Study 1 were used to examine gender differences in fear of crime and risk perception formation.
CHAPTER 4: A SOCIAL-PSYCHOLOGICAL PROCESS OF ‘FEAR OF CRIME’ FOR MEN AND WOMEN: REVISITING GENDER DIFFERENCES IN FEAR OF CRIME

This chapter includes a co-authored paper submitted for review. The bibliographic details of the co-authored paper, including all authors, are:


My contribution to the paper involved:

As first author of the current manuscript I assisted in the recruitment of participants for the 2017 Gold Coast Community Survey, acquisition of data, all subsequent data cleaning/screening and analyses of SEM and CFA models. I was responsible for writing all sections of the manuscript for initial review. Dr Hart was responsible for initial edits/revisions to the manuscript prior to submission to the journal.

(Signed) ___________________________ (Date) 23rd February 2018
Michael Chataway (Corresponding Author)

(Countersigned) ___________________________ (Date) 23rd February 2018
Supervisor: Dr. Timothy C. Hart
4.1 Abstract

Prior research has identified gender as a significant predictor of crime fear. Specifically, women are typically more fearful of crime than men, despite being relatively less likely to be victimised. The current study examines different ways men and women may think about crime and victimisation within their neighbourhoods. Data were collected from a sample of community residents ($N = 713$) living on the Gold Coast of Queensland, Australia. Results suggest that men’s and women’s fear of crime and perceptions of victimisation threat are dependent on crime type and can be represented by a number of relationships among different social-psychological dimensions of victimisation worry. The study concludes with practical implications for researchers seeking to examine the complex associations between gender and fear of crime.

*Keywords.* Attitudes Towards Crime; Gender; Social-Psychological Dimensions of Crime Fear; Gender-Fear-Victimisation Paradox.
4.2 Introduction

The fear of crime-paradox suggests that women are generally more fearful of crime than men, despite being significantly less likely than men to be crime victims. Most empirical evidence supporting this paradox is produced from studies in the United States and Europe and predates recent developments in the measurement of fear of crime as a social-psychological process (Jackson, 2009; Chataway & Hart, 2016; Chataway et al., 2017). In response, the present study re-examines the relationship between gender and fear of crime using gender-specific models and measures derived from Jackson’s (2005) social-psychological model of victimisation worry.

4.3 Literature Review

The relationship between gender and attitudes towards crime has interested social scientists for decades. During this time, several empirically-based explanations have emerged for why women are generally more fearful of crime than men, even though they are relatively less likely than men to be crime victims. This scholarship includes observed gender differences in perceptions of vulnerability and threat (Baumer, 1978; Hale, 1996; Jackson, 2009; Killias, 1990), inaccuracies of self-report victimisation of certain crimes (e.g., rape and sexual assault [Skogan, 1987]), notions of victim helplessness in patriarchal societies (Hollander, 2001), the “shadow sexual assault hypothesis” (Ferraro, 1995, 1996), and the way in which fear of crime and other associated features of crime fear are measured, particularly early fear of crime studies that focused on “formless” fear (Jackson, 2005).

4.3.1 Perceptions of vulnerability and threat. One explanation for gender differences in fear of crime is that women are more sensitive than men to risk and vulnerability (Hillinski, Pentecost Neeson, & Andrews, 2011; Warr, 1990). Women are perceived to be less able to defend themselves against victimisation, making them more likely to believe that the consequences of crime would have a greater impact on them—in
terms of both physical injury and psychological trauma (Killias, 1990; Smith, Torstenson, & Johansson, 2001).

Research examining vulnerability perceptions among men and women has implicated the role of vulnerability in fear of crime. Cook and Fox (2012) found that fear of physical harm was a more significant predictor of fear of home invasion, robbery, and murder for men and women than fear of sexual assault. Reasons for this finding may be linked to individual’s assessments of physical assault and its consequential impacts (e.g., harms) as being greater than that of sexual assault. Lane and Fox (2013) also demonstrate that perceived risk of victimisation, specifically likelihood of victimisation, is a significant predictor of fear of property crime, violent crime, and gang crime for men in their study of jail inmates in Florida.

Killias (1990) notes that high levels of fear of crime cannot be fully accounted for by exposure to direct risk, which has led him and others (e.g., Jackson [2006]) to propose an analytical framework of vulnerability—one that consists of perceived risk exposure, perceived consequences of victimisation, and levels of perceived control over victimisation. Killias’s schematic framework and the vulnerability hypothesis have been substantiated in international studies investigating fear of crime and safety perceptions among men and women. Carcach and Mukherjee (1999) found evidence for the vulnerability hypothesis and women’s fear of crime in a study of Australian women, noting that women’s perceptions of economic vulnerability, in particular social vulnerability, played a significant role in perceptions of safety. Similarly, Smith and Torstenson (1997) found that Swedish women’s fear of crime was accounted for by greater ecological vulnerability, explaining that women tended to see more crime risk in urban and public housing contexts than men. The authors also reported evidence that men tended to discount their feelings of risk and worry more than women, which explained the tendency for them to report being less fearful of crime.
4.3.2 **Self-report inaccuracies.** Inaccuracies in self-report victimisation that are related to certain crimes is an alternative explanation for gender differences in fear of crime. Researchers argue that official crime data fail to identify the full extent of female victimisation (Sacco, 1990). As a result, factors such as hidden violence are not taken into account when the nature of women’s “fear”—and what it is actually a response to—is studied empirically (Hale, 1996). Sacco (1990) argues that if such factors are considered, then disproportionate levels of fear of crime between men and women may be less pronounced than once thought.

Contemporary investigations like those by Reid and Konrad (2004) support Sacco’s argument, often finding that men tend to worry more about crime and have higher levels of perceived risk than women, if the type of crime considered is one that men are more likely than women to experience (e.g., robbery). Existing research also identifies socially desirable responses to self-report survey questions (Sutton & Farrall, 2005) and the “hegemonic masculine ideal” (i.e., an inability to express feelings of vulnerability, threat, and fear in response to the traditional view of what it means for a man to be “a man” or “masculine”) (Goodey, 1997) as other possible explanations for the fear of crime-paradox.

4.3.3 **Feminist perspectives.** Feminist criminology offers another explanation for observed differences in vulnerability perceptions among men and women. According to Stanko (1995), women’s anxiety about danger “is largely a fear of men [or male violence] and reflects women’s location in a gendered world” (p. 539). Furthermore, Reid and Konrad (2004) suggest that the disproportionate levels in fear of crime among men and women may, in part, be a product of how men and women are socialised to accept alternative assumptions about criminality and victimisation (see also, Chan & Rigakos, 2002; Goodey, 1997; Hollander, 2001).
Existing scholarship supports feminist perspectives, showing that higher rates of fear expressed by women may reflect broader concerns of sexual harassment and assault (Ferraro, 1995; Pain, 2001; Reid & Konrad, 2004; Stanko, 1995). Moreover, official crime statistics show that women are more likely to be the victims of sexual offences, which could generate a pervasive fear of sexual victimisation and vulnerability (Schafer et al., 2006). These findings have given rise to what is referred to in the fear of crime literature as the “shadow sexual assault hypothesis” (Ferraro, 1995, 1996), which has been substantiated by early research on fear of rape as a “daily part of every woman’s consciousness” (Griffin, 1971, p. 25; Warr, 1985).

Some empirical research has confirmed the link between women’s underlying fear of sexual intrusion and their more general fear of crime (see for example, Ferraro, 1996; Fisher & Sloan, 2003; May, 2001b). In reference to individuals fear of specific types of crime, research has identified larger effect sizes between fear of sexual intrusion and fear of personal crimes in contrast to fear of non-violent crimes (Dobbs et al., 2009). Lane and Fox (2013), mentioned above, also found that along with perceived risk of victimisation, fear of sexual assault significantly predicted female prison inmates fear of property, violent and gang crime. More recent work by Pettit and colleagues (2017) found that fear of sexual harm and risk perception had the most significant effect on fear of crime for both genders. Moreover, the authors note that fear of sexual harm among female respondents had a significant impact on their fear of violence. Other contemporary work has explored the interactions between contemporaneous offences, gender, ethnicity, and fear of crime. Britto, Stoddart, and Ugwu (2017), for example, found that their sample of African-American women had higher levels of fear towards violent crime, but when fear of rape was included in their model, African-American men were subsequently more fearful of violent crime, suggesting the presence of a “sex-fear paradox”.
Despite this empirical evidence, some research has found that fear of sexual assault has a lessened effect on fear of violent crime for both men and women (e.g., home invasion) and that fear of harm may be a more significant predictor of general patterns of crime fear (Cook & Fox, 2012). This would suggest that vulnerability perceptions involving an assessment of the consequences of potential victimisation exert a significant influence on general worry about crime than focal concerns about sexual assault. This has led some researchers to suggest that men and women are actually quite similar in terms of what drives their fear of crime (Cook & Fox, 2012).

4.3.4 Measuring fear of crime. Gender differences in fear of crime may also be due to the way in which it is measured. Farrall and colleagues (1997) argue that a range of methodological problems have been identified within early measures of fear of crime, which raise the possibility that it may be significantly misrepresented, and inaccurately operationalized. Subsequently, scholars have argued for theoretical clarification of the meaning and measurement of “fear of crime” (Covington & Taylor, 1991; Ditton et al., 1996; Gabriel & Greve, 2003; Jackson, 2005).

In response, research in the field of psychology has explored the nature and meaning of crime fear. Gabriel and Greve (2003) adopt a psychological approach when theorizing about fear of crime, describing it as a multifaceted concept. First, they postulate that crime fear must be grounded in the experience of feeling fearful (affective fear). Second, they argue that affective fear must be accompanied by perceptions of a threatening object or situation. The event experienced must also be perceived as threatening or dangerous to elicit an affective reaction, regardless of later perceptual ambiguity or false alarm. Cognitive appraisal of threat may not only include perceptions of the likelihood of victimisation, but be broadened to include the anticipated consequences of victimisation if it were to occur, and the degree of perceived control or self-efficacy an individual has over potential criminal
victimisation (Killias, 1990). Finally, there is usually an expressive component to crime fear, or a behavioural/physiological reaction (i.e., avoidance and withdrawal from an unpleasant fear provoking stimuli).

Despite Gabriel and Greve’s (2003) efforts (see also, May et al., 2010), inconsistencies around the influence that gender may have on the affective and cognitive componentry of fear of crime remain. These inconsistencies may be attributed to an overreliance in early studies on fear of crime that used perceptions of safety questions as a proxy for measuring dispositional states of fear. As Farrall et al. (1997) argue, perceptions of safety questions measure formless fear as opposed to concrete expressions of fear. Formless fear refers to generalised patterns of vulnerability that may not necessarily be associated with a specific concrete experience of criminal victimisation (Keane, 1998). When comparing responses to questions measuring formless fear and concrete fear, research shows inconsistencies in safety perceptions and their subsequent effect on fear of crime; specifically, perceptions of safety questions often fail to measure concrete fearful reactions to crime and disorder (Jackson, 2004). It is difficult, therefore, to determine whether gender differences in perceptions of safety are associated with a specific type of crime or a specific location. Furthermore, it is challenging to establish whether such questions are even measuring a specific state of crime fear or worry (Pain, 2001).

In response to the shortcomings of early measures of perceived safety, Farrall et al. (1997) argue that (a) there needs to be more attempts made to validate measures of fear of crime; (b) fear of crime can be measured as a multifaceted phenomenon (Gabriel & Greve 2003); and (c) questions should attempt to measure on-going as opposed to intermittent fears of victimisation. In doing so, we may achieve a greater conceptual understanding of fear of crime and related constructs (i.e., risk perception).
Researchers have recently offered structural process models of victimisation worry in an attempt to provide a more comprehensive approach to understanding fear of crime (see, for example, Farrall et al. [1997], Taylor and Hale [1986], and Van der Wurff, et al., [1989]). For example, Jackson (2005) was the first to propose a conceptual model of crime fear comprised of five distinct dimensions: (a) frequency of crime worry; (b) perceptions of the likelihood of victimisation; (c) perceptions of the consequences of victimisation; (d) perceptions of control over crime; and (e) beliefs about the prevalence of crime within the local area. These five dimensions of crime fear are further shaped by perceptions of the social and physical environment (e.g., perceptions of incivility and social cohesion), which are linked to previous work in sociology on broken windows (Wilson & Kelling, 1982; McGarrell et al., 1997) and work on collective efficacy and neighbourhood social cohesion (Gibson et al., 2002; Sampson & Groves, 1989). Jackson’s Model of Victimisation Worry is depicted in Figure 1, along with the hypothesised relationships between related constructs.

Figure 1. Jackson’s Social-Psychological Model of Victimisation Worry

+ / - represent the hypothesised directions of relationships
Jackson asserts that fear of crime consists of worry events, subjective risk assessments, and interpretations of the immediate social and physical environment. It is important to identify the rationale for measuring frequency of worry, rather than “fear” in this model, given existing debate around the conceptual differences between fear as a mental event, and worry as a mental state that varies in intensity (Hough, 2004). Jackson argues that fear is a strong physical reaction to a momentary stimulus (e.g., a gun being pointed directly at your head is likely to elicit an immediate fearful response to flee or move your body out of the gun’s path), and is perhaps “too strong a word for the more common situations an individual may find themselves in” (p. 5).

On the other hand, using the word “anxiety” to describe crime fear may be too diffuse and generalized, and may not refer to a specific situation or experience of threat posed by crime and/or disorder in the immediate environment (Jackson, 2005). Finally, “worry” encompasses an emotional evaluation of a momentary event, as well as concerns about potential danger of imminent or distant threats that may occur in the future (Jackson, 2004) (e.g., a mental state of dispositional fear). Thus, the inclusion of worry indicators to test fear of crime may provide a more accurate conceptualisation of how risk is interpreted and encoded in a cognitive capacity, and how appraisal of risk is associated with an affective response to crime or imminent danger at a specific point in time and particular location. Validation studies of Jackson’s model have demonstrated that it has good scaling properties, and that the five factors of victimisation worry it contains have good reliability and internal consistency. Specifically, cross-cultural validity of the model has been shown in studies conducted in Europe (Jackson, 2005; 2009) and Australia (Chataway & Hart, 2016).

Jackson (2009) also argues differences exist in the psychological dimensions of vulnerability/appraisal of threat (i.e., within his model, vulnerability/risk perception formation is represented by the following dimensions: consequences, control, and likelihood),
as well as their mediational relationship with physical ability to defend oneself and relative risk judgment. Specifically, he found that females worry more frequently than males about victimisation partly because (a) they feel less able to physically defend themselves, (b) they have lower perceived self-efficacy (i.e., control), (c) they have higher perceived negative impact, and (d) they see the likelihood of victimisation as higher for themselves and for their social group. However, it is important to note that some research contradicts Jackson’s findings when considering the crimes men and women are more likely to be exposed to and their subsequent fear of these types of crime (Reid & Konrad, 2004).

4.3.5 The present study. Existing research is yet to explore whether gender moderates the strength and direction of hypothesised relationships between all five victimisation-worry constructs depicted in contemporary social-psychological process models. Theoretically, established research suggests that risk perception and vulnerability may be gendered. That is, men and women may view risk differently, and this may affect the relationship between risk and worry about crime and/or imminent threat. Thus, further attempts should be made to test whether the social-psychological processes proposed in Jackson’s model (as presented in Figure 1) are different for men and women.

Existing research is also yet to explore whether one’s gender influences the relationship between perceptions of the physical and social environment and the five core constructs proposed in Jackson’s model. Research exploring the relationship between endogenous environmental characteristics and risk perception/appraisal of threat suggests that perceptions of incivility may have a stronger impact upon worry about crime for women, than it does for men (Carcach et al., 1995).

Jackson’s model shows promise in advancing our understanding of the multifaceted nature of fear of crime and related constructs of vulnerability and risk perception. More specifically, the model can be tested to see if the cognitive and affective components of fear
of crime in neighbourhoods differ among men and women, and how risk perception may differ among genders. This ultimately would provide a more detailed picture of the unique ways men and women differ with respect to how they perceive crime and add insight into existing—and sometimes competing—explanations. The present study begins to address these gaps in the contemporary literature by exploring the hypothesised dimensions of victimisation worry proposed by Jackson (2005) and their interconnections with gender. Specifically, the current research examines whether gender moderates specific paths/dimensions of Jackson’s model.

4.4 Methodology

Data used in the current study were collected during the 2014 Gold Coast Community Survey (GCCS), a self-administered mail survey of residents 18 years of age and older living on the Gold Coast of Southeast Queensland, Australia. Of the 2,354 randomly sampled households contacted and asked to participate, a total of 713 questionnaires were completed and returned. Demographic characteristics of GCCS participants are presented in Table 1 and show that the typical participant was a 56-year-old Australian female, who was currently married at the time of the survey, and who had lived in her neighbourhood for approximately 10 years.

Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>254</td>
<td>36.13</td>
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<tr>
<td>Female</td>
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</tr>
<tr>
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<td>234</td>
<td>32.96</td>
<td></td>
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<td>Yes</td>
<td>476</td>
<td>67.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently Married(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>29.81</td>
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<tr>
<td>Yes</td>
<td>492</td>
<td>70.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>692</td>
<td>18</td>
<td>93</td>
<td>56.02</td>
<td>15.93</td>
<td></td>
</tr>
<tr>
<td>Time at current residence (months)</td>
<td>691</td>
<td>1</td>
<td>1062</td>
<td>119.67</td>
<td>123.44</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values under the percentage columns reflect the percentage of valid responses.
\(^1\) Currently married includes *de facto* marriage.
The current study utilises Jackson’s model depicted in Figure 1 to test our research hypotheses. Therefore, measures associated with perceptions of neighbourhoods and the five constructs associated with fear of crime were collected during the GCCS.

4.4.1 Dimensions of crime fear. Each of the five dimensions of fear depicted in Figure 1 (i.e., worry, likelihood, consequences, control, and belief) was measured during the GCCS. Worry was measured using a 4-item response set, where 1 indicates “Not once in the last month” and 4 corresponds to “Everyday” ($M = 1.38; SD = 0.51$). Likelihood of victimisation was measured on a 7-point scale, where only the endpoints were labeled: 1 = “Definitely not going to happen” and 7 = “Certain to happen” ($M = 2.36; SD = 1.12$). Participants’ attitudes about the consequences of criminal victimisation were also measured on a 7-point scale, with only the endpoints labeled: 1 = “Not at all” and 7 = “To a very great extent” ($M = 5.45; SD = 1.54$). Using the same 7-point scale, GCCS participants’ were asked about the extent to which they had control over becoming a crime victim ($M = 3.70; SD = 1.62$). Finally, participants were asked how often they believe that crime would occur in their neighbourhood during the next month (i.e., belief). A 4-point scale that ranges from 1 “Never in the next month” to 4 “Every day in the next week” was used to measure this dimension of fear ($M = 1.75; SD = 0.63$).

4.4.2 Neighbourhood characteristics. In order to assess perceptions of neighbourhood characteristics, seven questions were used to measure attitudes towards both physical and social incivility. Participants were asked how much a problem they felt the following conditions were in their neighbourhood: (a) vandalism/graffiti; (b) rubbish in the streets; (c) dogs out of control/creating a mess; (d) drug-taking in the open; (e) drinking in the street; (f) teenagers hanging around; and (g) not enough things for young people to do. On average, participants rated their neighbourhoods 3.07 out of 4.00 ($SD = 0.62$), where 1
Seven questions were also used to measure informal social control and social capital (i.e., social cohesion). Participants were asked how much they agreed with the following statements: (a) the people who live here can be relied upon to call the police if someone is acting suspiciously; (b) if any of the children or young people around here are causing trouble, local people will tell them off; (c) if I sensed trouble whilst in this area, I could raise attention from people who live here for help; (d) this area has a close, tight-knit community; (e) this area is a friendly place to live; (f) this area is a place where local people look after each other; and (g) most people who live in this area trust one another. Using a 5-point scale, where 1 corresponds to “Very strongly agree” and 5 corresponds to “Very strongly disagree,” on average, participants indicated that the area in which they lived is somewhat socially cohesive ($M = 2.37; SD = 0.89$).

### 4.4.3 Crime types.

Questions about the five dimensions of fear were asked in the context of a specific crime. For the models that follow, consideration was given to both personal and property offenses. Incidents of personal victimisation include (a) being attacked by a stranger in the street; (b) being robbed or mugged in the street; and (c) being harassed, threatened, or verbally abused in the street. Property victimisation considered in the GCCS include (a) having someone break into a resident’s home whilst they are there; and (b) having someone break into a resident’s home whilst they are away.

### 4.4.4 Analytic Strategy.

A series of Structural Equation Models (SEMs) were estimated to test whether gender moderated five social-psychological dimensions of victimisation worry and risk perception depicted in Figure 1. Models were estimated using Maximum Likelihood Estimation procedures in IBM SPSS and Analysis of Moment Structures. We test the measurement model and direct effects using multigroup SEM
approaches, which have been regarded as a viable statistical strategy for comparing groups in relation to theoretical constructs contained in structural process models (Acock, 2013). We also use the multigroup SEM strategy to calculate the chi-square test of difference between the two gender categories and each structural model of victimisation worry. This multigroup strategy allows researchers to determine whether there are significant differences between multigroup models. Structural equation modeling is also preferred over multiple regression approaches because they allow for model constructs to be tested simultaneously. Finally, where a significant difference in the chi-square test is noted, we report the results of the path analysis between the various dimensions of the model, separated by gender.

### 4.5 Results

Does gender moderate relationships between the multiple dimensions of crime fear depicted in Jackson’s (2009) model? And if so, does it weaken or strengthen the direction of the hypothesised relationships in his social-psychological model of victimisation worry? To address these questions, we first report relevant fit statistics for both the group models, which are estimated to determine whether the model fits the data appropriately. Next, results of SEMs testing fear of personal and property victimisation for both groups (i.e., males and females) are reported. Results of gendered models are reported at a one-tailed test of significance, given the hypothesised directions of Jackson’s model noted in Figure 1.

#### Table 2

<p>| Model Fit Statistics for Multigroup Gender Model of Victimisation Worry |
|---------------------------|-----------|----------|-----------|-----------|-----------|-----------|</p>
<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>df</th>
<th>$\chi^2$</th>
<th>$p$</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Crime Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>248</td>
<td>9</td>
<td>41.02</td>
<td>&lt; .001</td>
<td>.95</td>
<td>.95</td>
<td>.89</td>
<td>.91</td>
</tr>
<tr>
<td>Females</td>
<td>430</td>
<td>9</td>
<td>31.73</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.95</td>
<td>.93</td>
<td>.95</td>
</tr>
<tr>
<td><strong>Property Crime Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>246</td>
<td>9</td>
<td>31.89</td>
<td>&lt; .001</td>
<td>.96</td>
<td>.92</td>
<td>.89</td>
<td>.92</td>
</tr>
<tr>
<td>Females</td>
<td>430</td>
<td>9</td>
<td>40.73</td>
<td>&lt; .001</td>
<td>.97</td>
<td>.93</td>
<td>.92</td>
<td>.93</td>
</tr>
</tbody>
</table>

*Note. Since chi-square statistics $\chi^2$ are sensitive to large sample sizes, relative fit statistics were estimated to provide a clearer picture of model fit and specification (see Bentler and Bonett, 1980; Jöreskog, 1981).*
Table 2 contains fit statistics for personal and property crime models, grouped by participants’ gender\textsuperscript{10}. For fear of crime against persons, data fit both models satisfactorily. Measures of fit indicating marginal to good fit are based on the existing guidelines for the following indices GFI, CFI, and IFI (see Bollen & Long, 1993; Hu & Bentler, 2009). The NFI indicates a poor fitting model for male’s fear of personal crime (NFI = .89). However, the NFI is not always recommended for model interpretation, since the index is positively correlated with the number of parameters in a model. Thus, it is suggested that researchers assess additional fit indices such as the CFI (provided in Table 2, and within appropriate cut off ranges), or the TLI (Bollen & Long, 1993).

A similar pattern was observed in fit indices for fear of property crime, with data from both models indicating marginal to good fit (once again, with exception to the NFI for the male model = .89). Collectively, these results suggest that data from both males and females, in relation to their perceptions of personal and property crime in their neighbourhoods, fit Jackson’s model adequately.

\subsection*{4.5.1 Fear of personal victimisation.} The chi-square test of difference for the multigroup fear of personal crime model was statistically significant ($\chi^2 = 21.08$, $p = .049$), indicating that there were significant differences between males and females fear of personal victimisation. As differences were identified in fear of personal crime among men and women, additional tests were performed to identify the specific paths that differed significantly among men and women in relation to fear of personal crime. Tables 3 and 4 contain values associated with (a) the unstandardized and standardized coefficients for each direct path produced from the gender (“male” and “female”) process models (see Figure 1); and (b) $z$-scores of the differences between the models’ regression coefficients (Brame et al., 1998). Table 3 presents these results when data were limited to perceptions of crimes against
persons, whereas Table 4 conveys this information for attitudes towards *property* victimisation.

Table 3
Direct Effects Between Constructs Contained in the Perceptions of Personal Crime Models, by Gender and Differences in Path Coefficients

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>Male (M)</th>
<th>Female (F)</th>
<th>M-F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$\beta$</td>
<td>$p$</td>
</tr>
<tr>
<td>Incivilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>-0.37</td>
<td>-0.39</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Belief</td>
<td>0.56</td>
<td>0.54</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.25</td>
<td>0.24</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Worry</td>
<td>0.10</td>
<td>0.10</td>
<td>.087</td>
</tr>
<tr>
<td>Cohesion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>-0.19</td>
<td>0.18</td>
<td>.002</td>
</tr>
<tr>
<td>Control</td>
<td>0.01</td>
<td>0.01</td>
<td>.898</td>
</tr>
<tr>
<td>Beliefs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.21</td>
<td>0.21</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.18</td>
<td>0.19</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Worry</td>
<td>0.04</td>
<td>0.05</td>
<td>.400</td>
</tr>
<tr>
<td>Likelihood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worry</td>
<td>0.50</td>
<td>0.50</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>-0.15</td>
<td>-0.15</td>
<td>.004</td>
</tr>
<tr>
<td>Worry</td>
<td>-0.03</td>
<td>-0.03</td>
<td>.628</td>
</tr>
</tbody>
</table>

-- Value less than .005
* $p < .05$ (one-tailed test)

Table 3 contains several noteworthy findings. First, all but three of the relationships hypothesised in Figure 1 are supported in the “male” model of personal crime victimisation (when tested at the $\alpha = .10$ level). Second, except for the incivilities-likelihood association ($b = .08, p = .206$), the same significant paths that were observed in the “male” model were also observed in the “female” model; again, in the hypothesised directions. Third, there was evidence that depending on an individual’s gender certain relationships hypothesised in the model were either strengthened or weakened.

For example, the association between perceptions of incivility in a neighbourhood and perceptions of the likelihood of personal victimisation was significantly stronger for men,
compared to women ($z = 1.90, p = .029$). This suggests that perceptions of incivility have a greater effect on perceptions of the likelihood of victimisation for men, but not women in the sample. Similarly, the association between perceptions of social cohesion in a neighbourhood and perceptions of the likelihood of personal victimisation was significantly stronger for men, compared to women in the sample ($z = -1.99, p = .024$). This suggests that perceptions of social cohesion within an area have a greater effect on perceptions of the likelihood of victimisation for men, but not women in the sample.

Finally, the association between perceptions of the likelihood of personal victimisation and worry about becoming the victim of a personal crime was strengthened for men, compared to women ($z = 2.40, p = .008$). This suggests that for men, perceptions of the likelihood of victimisation have a greater effect on the frequency in which they worry about becoming the victim of a personal crime. It also suggests that men may be more sensitive to victimisation risk than women.

4.5.2 Fear of Property Victimisation. The chi-square test of difference for the multigroup fear of property crime model was significant at the $\alpha = .10$ level ($\chi^2 = 19.11, p = .08$). In Table 4, regression coefficients of model pathways for gender are presented for perceptions of property victimisation, along with the $z$-scores associated with differences between models by gender. Compared to the results presented in Table 3, analysis of the property victimisation data reveals that fewer paths for both males and females were statistically significant. Specifically, only one of the coefficients that were compared between the group models was meaningful. Similar to the personal crime data, the association between perceptions of incivility and perceptions of the likelihood of property victimisation was stronger for men than for women ($z = 3.21, p < .001$). This suggests that perceptions of incivility had a greater effect on perceptions of the likelihood of victimisation for men, but not women in the sample.
Table 4
*Direct Effects Between Constructs Contained in the Perceptions of Property Crime Models, by Gender and Differences in Path Coefficients*

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>Male (M)</th>
<th>Female (F)</th>
<th>M-F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$\beta$</td>
<td>$p$</td>
</tr>
<tr>
<td>Incivilities</td>
<td></td>
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<tr>
<td>Cohesion</td>
<td>-0.39</td>
<td>-0.40</td>
<td>&lt;.001</td>
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<tr>
<td>Belief</td>
<td>0.45</td>
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<td>&lt;.001</td>
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<tr>
<td>Likelihood</td>
<td>0.29</td>
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<tr>
<td>Worry</td>
<td>0.09</td>
<td>0.09</td>
<td>.114</td>
</tr>
<tr>
<td>Cohesion</td>
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<td>.317</td>
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<tr>
<td>Likelihood</td>
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<td>Consequences</td>
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<tr>
<td>Likelihood</td>
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<td>&lt;.001</td>
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<tr>
<td>Control</td>
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<td>.323</td>
</tr>
<tr>
<td>Worry</td>
<td>--</td>
<td>--</td>
<td>.937</td>
</tr>
</tbody>
</table>

Value less than .005

* $p < .05$ (one-tailed test)

4.6 Discussion

Gender is often found to be a significant predictor of fear of crime, and typically these findings show that women are more fearful of crime than men. However, limited research has investigated whether men and women differ in respect to how they think about crime and disorder within their community. The present study begins to address this gap within the contemporary literature by examining whether an individual’s gender moderates the relationships between specific social-psychological dimensions of victimisation worry. There were a number of notable findings in the present study that speak directly to this research question and warrant further discussion.
First, the present study found that gender moderates some of the specific dimensions of Jackson’s social-psychological model of victimisation worry, and this association between gender and victimisation worry is dependent on crime type. Specifically, there were more significantly different pathways between constructs in the personal crime model (i.e., Incivilities-Likelihood; Cohesion-Likelihood; & Likelihood-Worry) compared to the property crime model (i.e., Likelihood-Worry). This suggests that the degree to which men and women think similarly about crime may be crime-type dependent, and related to a higher order structure of personal versus property crime perceptions. Our research has expanded on previous work in this area, which has tended to examine the effect of gender on fear of single crime types (i.e., fear of assault) (Cook & Fox, 2012).

Our findings are further supported by Reid and Konrad (2004) who found that fear of crime differed among men and women, when controlling for the types of crime that men and women were more likely to experience—in terms of direct victimisation. Our findings somewhat mirror those by Reid and Konrad. Specifically, we found that for fear of personal crime the likelihood-worry relationship (i.e., perceived risk) is statistically stronger for men, than it is for women—notably, likelihood of victimisation significantly contributes to worry of personal victimisation for both genders.

Second, in terms of explaining gender differences in fear of personal victimisation, our findings suggest that one must consider the relationships between particular fear constructs (e.g., Likelihood and Worry), as certain constructs differ among men and women, while others do not (e.g., Beliefs and Likelihood). Additionally, to suggest that there is a paradoxical relationship between fear of crime and gender is too simplistic, and researchers need to consider the complex social-psychological processes of victimisation worry and risk perception formation in order to better understand the reasons for why men and women may perceive crime risk differently. Although the present study explores whether gender
moderates the processes (i.e., changes the direction and strength of relationships) defined in Jackson’s model, the current findings can be applied to existing research that explores more specific mediational features of risk perception and sensitivity to risk.

For example, Jackson (2009) found that perceptions of risk differ among men and women, when considering the social-psychological characteristics of risk (e.g., likelihood of victimisation, consequences of victimisation, and control over crime). These findings also support Chan and Rigakos’ (2002) argument that risk and risk perception is gendered—more specifically, in the current study, fear of personal crime appears to be gendered. That is, one’s gender, influences the nature of the relationships between risk perceptions and frequency of worry about personal victimisation (specifically, the likelihood-worry relationship).

Finally, although some differences are noted between men and women in regards to the process of victimisation worry (or fearing), for the most part, the paths in Jackson’s process model are statistically similar and not directly affected by one’s gender. This would suggest that the processes of fearing for men and women are quite similar, and dependent upon specific dimensions of victimisation worry (i.e., perceptions of victimisation risk has a direct influence on worry about personal/property crime in both men and women in our sample). This finding is consistent with previous research that has found that drivers of fear of personal crime are quite similar between men and women (Cook & Fox, 2012).

Theoretically, some of the significant paths between dimensions of the model would support the vulnerability hypothesis (outlined above). For example, for both men and women, we found that perceiving more serious consequences of personal and property victimisation resulted in higher levels of perceived risk towards these types of crime. This finding is supported by existing research highlighting the impact of vulnerability perceptions (particularly assessments of the seriousness or consequences of victimisation) on fear of property and personal crime among men and women (Lane & Fox, 2013).
4.6.1 **Future directions.** Collectively, current findings provide guidance to researchers exploring the role gender plays in fear of crime and risk perception formation. The present research shows that parts of the environmental backdrop (e.g., *incivility* and *social cohesion*) appear to influence risk perception differently among gender groups, which is also consistent with research presented above (Carcach et al., 1999). Future research is needed to explore the specific reasons for why perceptions of the physical environment may have a more salient impact on crime fear for a specific gender (in this study men were more sensitive to incivility in their neighbourhoods). This could involve testing whether men and women differ in respect to their levels of crime construal (see Gouseti and Jackson [2015] for more information).

Additionally, future research might wish to consider the role socially desirable responding has on the various dimensions of Jackson’s social-psychological model of victimisation worry, given that a consistent number of studies have found that men are more likely to respond in socially desirable ways when asked about their levels of fear of crime on quantitative surveys instruments (Smith & Torstenson, 1997; Sutton & Farrall, 2005). Future models may include and test social desirability measures as a mediator of frequency of worry and indicators of risk perception in Jackson’s model. This may provide a more detailed understanding of the differences in fear levels and associations between specific paths of victimisation worry in relation to gender, by potentially reducing measurement inaccuracies that have been found in previous research that has tested the impact of gender on fear of crime.

4.6.2 **Limitations.** The current study used cross-sectional data for all analyses. Jackson’s model is a process model; thus, time series data is needed to accurately determine how subjective assessments of risk vary as a function of neighbourhood conditions. Additionally, we do not investigate whether the influence that gender has on the various
dimensions of victimisation worry remains stable over time. This may be important to examine given research by Cops and Pleysier (2010), who found that the effect that gender has on levels of fear diminishes across the life course of an individual. This may mean that confounding factors such as the age of the individual may exert influence on levels of fear of crime at later stages of development. Additionally, feminist perspectives argue that difference and diversity among women in respect to race, age, sexuality, and other socio-demographic characteristics may influence women’s perceptions of the built environment and their feelings of safety. Therefore, future research might consider combining specific demographic groups together, in order to determine what effect these different combinations may have on fear of crime using Jackson’s structural process model.

The current study also appears to show that there are consistently poor associations among specific dimensions of Jackson’s model of victimisation worry. Specifically, we found that control over crime appeared to have weak relationships with specific dimensions of Jackson’s model (i.e., likelihood, worry, and cohesion). This is inconsistent with Jackson’s original research, and requires further investigations to determine whether the model should be modified to exclude perceptions of control, given the very weak associations with other hypothesised dimensions of the model when considering gender.

It must also be acknowledged that the current study does not account for other neighbourhood level measures that are not perceptual, but may further shape fear of crime and risk perception. These may include neighbourhood crime rates during the data collection period, the number of active local crime fighting organisations proximate to respondents, the number of friends a person has, or their level of social interaction with their neighbours. However, it is important to note that some research has identified that other neighbourhood-level measures such as social process, neighbourhood structure, and neighbourhood crime
In addition, the current study does not control for perceived risk of sexual assault and how this may mediate fear of personal and property crime offences. Although, our primary focus for the current study is on whether the processes of fearing in men and women (as hypothesised in Jackson’s (2005) model) differ, we do acknowledge that a considerable literature has identified that women’s fear of crime may be driven by an underlying fear of sexual intrusion/assault (Dobbs et al., 2009; Fisher & Sloan, 2003; Lane & Meeker, 2003; May, 2001). This underlying fear may contribute to fear of personal crime in women in our sample. Therefore, future work may consider investigating the effect contemporaneous offences (fear of sexual intrusion) have on the five fear dimensions in Jackson’s model and the two crime types tested. This would allow researchers to test the underlying reasons for why women may fear crime and isolate significant variables, such as “vulnerability” along with testing the fear-victimisation paradox further.

Furthermore, the current study does not assess momentary reactions to crime and disorder across an individual’s movements in time and place, but rather we measure ongoing reactions to crime and disorder within one particular location (i.e., the respondent’s neighbourhood). This was in line with Farrall et al.’s (1997) recommendations, based on their evaluation of existing measurement strategies used to test fear of crime. However, contemporary research using mobile technology has suggested that fear of crime events can be captured at the micro-level (i.e., fear of crime is context-dependent) (Solymosi et al., 2015; Chataway et al., 2017). In other words, as people go about their daily routine activities, their fear of crime and perceptions of immediate threat/risk may fluctuate in different public spaces. Thus, it may be important for researchers to assess how fear of crime among men and women differs across their everyday movements in the physical
environment, given previous research that suggests ecological vulnerability as a driver of perceptions of crime and victimisation risk.

Finally, because the current study relied on survey questions and corresponding response sets that were derived directly from Jackson’s (2005) original survey, this may have introduced some item-response bias, question order effects, or forced choice bias in participant’s responses to survey items. Therefore, future studies may consider adjusting the sequences/order of questions in future surveys using such measures to test for such effects (for detailed guidance see Dillman [2000] and Smyth et al. [2006]).

4.6.3 Conclusion. Despite its limitations, the current study has demonstrated that men and women may think differently about crime and disorder within their neighbourhoods. The current study found that some social-psychological dimensions of victimisation worry are moderated by gender, whilst others do not significantly change by gender. Collectively, the current study provides researchers with the opportunity to further explore the underlying psychological (e.g., cognitive and affective) processes that may impact fear of crime and perceptions of disorder among both men and women. Further research exploring gender differences and its influence on fear of crime and risk perception formation may provide criminal justice professionals with valuable information that can be used to develop more targeted and cost-effective fear reduction strategies that focus on the different elements of crime and disorder, which may drive fear perceptions in men and women.

ENDNOTES

1 It is important to note that for some types of crime (i.e., sexual assault) women are more likely to be the victim.
2 In the current manuscript the term “general fear of crime” encompasses fear of personal and property victimisation. However, it is important to note that other researchers have drawn distinctions between “general” or “pragmatic” fear (e.g., generalised anxiety) and fear of crime (see Chadee & Ng Ying, 2013).
3 The Gold Coast is located in Southeast Queensland, Australia. It is the second most populous city in the state, with approximately 537,844 residents (ABS, 2011). The Gold Coast covers about 1,379km².
4 Demographic characteristics of the sample are somewhat consistent with the general population living on the Gold Coast. Participants within the current sample differ on the following characteristics of age, housing tenure and marital status with reference to the general population according to data published by the Australian Bureau of Statistics (ABS, 2011). The current sample has somewhat similar demographic characteristics with reference to place of birth and Aboriginal descent to the general population living on the Gold Coast.
For the analyses that follow, both the incivility and the cohesion measures were reverse coded to more accurately reflect the hypothesised relationships between these and other constructs in model shown in Figure 1.

Assessing these crime indicators separately using first generation regression analyses (i.e., linear regressions) would limit interpretations of Jackson’s model dimensions and proposed factors of personal and property crime. Therefore, it is logical to test this model with more robust statistical analyses that allow for simultaneous assessment of model coefficients, such as SEM, which accounts for the degree of correlation that may be shared between both personal and property crime indicators.

Due to the measurement of the variables of interest to the study, factor scores were created to enable model estimation with SEM. Factor scores were created using Maximum Likelihood Estimation (MLE) and the regression method in IBM SPSS 22.0.

We assess model fit before testing mean differences by gender because as demonstrated in our review of literature many gender-fear studies continue to use single item measures, despite many scholars cautioning against their reliability and validity. Due to this, it is logical to first test whether these more sophisticated measures of victimisation worry fit men and women’s fear of crime, before comparing mean differences in gender models.

We also fit Jackson’s model of victimisation worry, irrespective of gender. The fit statistics for the personal crime model were: (GFI = 0.98; CFI = 0.93; NFI = 0.92; TLI = 0.84). Non-significant paths in this model are consequences-control and control-worry. The fit statistics for the property crime model were: (GFI = 0.98; CFI = 0.93; NFI = 0.92; TLI = 0.83). Non-significant paths in this model are the same as the personal crime model. Despite some non-significant relationships, both full models have satisfactory to reasonable fit when assessing them irrespective of individual differences.

Because Kenny, Kaniska, and McCoach (2011) caution that indices such as the RMSEA may be problematic and misleading when estimated models have small degrees of freedom, such as the current model, fit statistics exclude the RMSEA. Instead alternative indices of absolute and approximate/relative fit (e.g., GFI, CFI, NFI, IFI) are presented (Kenny, Kaniskan, & McCoach, 2011). The CFI in this case is reported instead of the TLI, because these two indices are highly correlated. Hu and Bentler (2009) suggest that for models using MLE, the desired cut-off for the CFI be close to .95.
4.7 Appendix

Frequency of worry about personal and property victimisation was measured by asking respondents the question: ‘During the past month, how often have you worried about the following…’ in relation to the five crime types of interest. Likelihood of victimisation was measured by asking respondents the question: ‘In the next 12 months, how likely do you think it is that you will fall victim to the following…’ in relation to the five crime types. Consequences of victimisation was measured by asking respondents ‘To what extent would your life be affected if you were to experience the following…’ in relation to each crime type. Control over victimisation was measured by asking respondents ‘To what extent do you feel that you have control over whether you will become the victim of the following…’ in relation to each crime type. Finally, beliefs about the prevalence of crime were measured by asking respondents ‘During the next month, how often do you think the following will occur in your neighbourhood…’ in relation to each crime type. All questions were referenced to the respondent’s neighbourhood.
4.8 References

LookupAttach/4102.0Publication30.06.105/$File/41020_WhosAfraid.pdf.


4.9 Chapter Summary

Chapter 4 presented a manuscript that investigated whether gender moderated specific dimensions of the social-psychological process model. Some paths in the victimisation worry model are significantly stronger depending on gender of the respondent. For example, for fear of personal crime the likelihood-worry relationship (i.e., perceived risk) is statistically stronger for men than it is for women. However, overall, most paths in the model did not differ by gender. This suggests that the processes behind fear of crime are quite similar for men and women in line with previous research. The manuscript presented in Chapter 4 shows how the social-psychological model in its current form can be used to produce new knowledge about the fear of crime among men and women, thereby answering the second research question of the current dissertation.

The results of Study 1, presented in Chapters 2 through 4 demonstrate that although the model of victimisation worry is applicable in an Australian context and can be used to impart new knowledge on particular issues relevant to fear of crime, we are still limited in our understanding of crime fear because of the associated limitations of the way in which data are collected. Data in Study 1 are collected using a cross-sectional paper-pencil survey. As mentioned in Chapter 1 (Section 1.4.2) of this dissertation, existing cross-sectional survey methods do not allow researchers to examine contextual variability in fear of crime, despite scholars alluding to the context-dependent nature of fear of crime and risk perception. This deficiency in our understanding of fear of crime is not due to a lack of disinterest, but rather shortcomings in the traditional methods used to capture fear of crime events in time and place. Without the development and piloting of new methods designed to capture fear of crime in the proximate environment, the ecological validity of the fear of crime constructs contained in the established model of victimisation worry tested in the previous chapters will be stymied.
The next chapter, Chapter 5, presents the findings from the second study of this dissertation, which explored whether mobile technology could be leveraged to collect reliable context-dependent data on fear of crime and risk perception using the established social psychological measures of victimisation worry from Study 1, and a mobile application called iExperience (IE).
CHAPTER 5: THE GEOGRAPHY OF CRIME FEAR: A PILOT STUDY
EXPLORING EVENT-BASED PERCEPTIONS OF RISK USING MOBILE
TECHNOLOGY

This chapter includes a co-authored paper. The bibliographic details of the
co-authored paper, including all authors, are:

fear: A pilot study exploring event-based perceptions of risk using mobile technology.

My contribution to the paper involved:

As first author of the current manuscript I assisted in the development of the mobile app to be
used for data collection. I also recruited participants independently from Griffith
University’s Gold Coast Campus for the current study. I conducted all subsequent data
cleaning/screening and analyses of logistic regression models in the results of the current
manuscript. I was responsible for writing all sections of the manuscript for initial review.
My supervisors assisted with the final editing process before submission. I was responsible
for responding to all reviewer comments and revisions under the supervision of Dr. Hart and
Professor Coomber. Dr. Hart, Professor. Coomber and Associate Professor. Bond provided
feedback on revisions of the manuscript at both the initial submission and the subsequent
revision.

(Signed) ________________________________ (Date) 23rd February 2018
Michael Chataway (Corresponding Author)

(Countersigned) ________________________________ (Date) 23rd February 2018
Supervisor: Dr. Timothy C. Hart
5.1 Abstract

The current pilot study explores whether mobile technology can be leveraged in survey research to gather meaningful context-dependent data on fear of crime and risk perception formation. A series of Ecological Momentary Assessments (EMAs) were administered to students enrolled at an Australian University (N = 20), using a smartphone application. Analysis of data collected from participants in their everyday activity spaces a) show strong internal consistency among multiple measures of crime fear; b) indicate that perceptual measures of social cohesion are significant predictors of victimisation worry; and c) support most hypothesised associations between concepts contained in contemporary models of crime fear. Unfortunately, some aspects of the pilot study design could not be implemented as planned, which have implications for future research. Specifically, we found that triggering participant’s surveys based on their location (rather than time), produced data that was not conducive to robust place-based analysis. In spite of this limitation, we offer alternative means of measuring the effects of place on fear of crime using mobile devices.

Keywords: Fear of crime; reliability; measurement; place-based perceptions
5.2 Introduction

Public perceptions of crime have an important influence on policy decisions in relation to community safety and the operational activity of law enforcement. Place-based information collected from residents about their perceptions of crime may provide critical information about the state of crime fear within communities, and provide opportunities for managing it more effectively and efficiently. However, most fear of crime research fails to consider the impact that “place” has on fear of crime. Despite recent advancements in geographic technologies, there has been little in the way of methodological improvements to the way we measure fear of crime amongst individuals within their natural environment.

The purpose of this pilot study is to examine whether mobile technology can be leveraged in survey research to gather meaningful context-dependent data on fear of crime and risk perception formation. With exception of recent work by Solymosi and colleagues (2015), no known research has examined this important question. We argue that using mobile technology as a tool to collect information about context-dependent perceptions of crime requires a greater recognition of the complexity of fear of crime and its measurement as a social-psychological construct. Furthermore, we argue that a more thorough conceptualisation of “place”—and what it means with respect to an individual’s fear of crime—is long overdue. Finally, we conclude that future work utilising mobile technology to test fear of crime should consider it as a dynamic emotional response to crime and disorder grounded in the everyday experiences of individuals within their proximate environment.

5.3 Literature Review

5.3.1 The geography of crime fear. The physical landscape and social geography of “places” affect perceptions of crime, which has been documented in the literature at varying scales. In terms of the physical landscape, macro-level sociological theories have long argued that neighbourhood structural factors can disrupt a community’s ability to self-
regulate, which in turn causes crime and delinquency (Park & Burgess, 1925; Shaw & McKay, 1942). Existing contemporary research also shows that perceptions of neighbourhood disorder and physical decay influence perceptions of crime (Brunton-Smith & Sturgis, 2011). Moreover, extant literature suggests that adverse perceptions of crime can cluster within socially disorganised neighbourhoods, similar to the way that crime patterns form hot spots (Wyant, 2008).

At the micro-level, criminology-of-place scholars argue that crime concentrates and endures in relatively smaller units of geography, including street segments (Weisburd, Benasco, & Bruinsma, 2009; Weisburd & Eck, 2004). Furthermore, these scholars purport that the environmental backcloth is supportive of victim and offending behaviour within these small geographic “places” (Brantingham & Brantingham, 1999), and that the physical characteristics of the environmental backcloth can influence attitudes towards crime, as well as individual responses to it (i.e., constrained behaviours) (Pain, 2000; Warr, 1990).

In terms of social geography, existing research demonstrates a strong correlation between the social meaning of “places” and attitudes towards them, including attitudes towards crime. Research within this field has linked fear of crime, for example, to how people view their quality of life and the urban environment in which they live (Pacione, 2003). This perspective reflects a more humanistic interpretation of place (Tuan, 1977), where “spaces become ‘places’ as they become imbued with meaning through lived experiences” (Stedman, 2003, p. 672). This means that we must better understand the way in which individuals interact with their proximate environment if we are to better understand how their attitudes, such as fear of crime, are affected by it.

With few exceptions (e.g., Solymosi et al. [2015]), most studies largely ignore the interaction between people and their proximate environment and how this interaction affects perceptions of crime. This deficiency in the existing empirical scholarship may not be a result
of disinterest, but rather shortcomings in the traditional methods used to study fear of crime and the common measures used to assess it. Without new methodological approaches to studying—and innovative ways of measuring—this important social issue, our ability to disentangle the role “place” plays in risk perception formation will be stymied.

5.3.2 **Measures and methods in fear of crime research.** Scholars have debated the validity and reliability of traditional measures of fear of crime for many years, especially perceptions of safety questions such as, “How afraid are you of walking alone in your neighbourhood at night” (Farrall et al., 1997; Jackson, 2005). Results from various national surveys indicate that when asked about perceptions of safety at night in an area, individuals tend to indicate that they are somewhat fearful, with most fearful respondents being women and the elderly (e.g., ABS, 2010). However, scholars have argued that perceptions of safety questions such as these are simply too narrow for measuring complex processes that may be associated with fear of crime, as they tend to disregard physiological and emotional responses to criminal events (Jackson, 2005; Hale, 1996). Additional criticisms of traditional measures of crime fear are that they a) ignore the frequency with which respondents feel fearful of crime; b) fail to identify whether fear varies over time; and c) ignore important features related to risk perception formation such as perceptions of control and consequences of victimisation (Killias, 1999).

In response, more valid and reliable indicators of victimisation worry have been developed. These alternative measures are framed in reference to existing research on risk perception formation (Killias, 1999) and social-psychological theories of fear, evaluating the *physical* and *social* environment, general beliefs about the frequency with which crime occurs, whether an individual can *control* becoming a victim of crime, and the perceived *consequences* of victimisation if it were to occur (Jackson, 2004). Furthermore, tests of these alternative indicators of crime fear in robust social-psychological models of victimisation
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worry (e.g., Jackson, 2004, 2005, 2009; Chataway & Hart, 2016) show that they are valid and reliable measures of this complex, multi-dimensional concept (see Figure 1).

![Figure 1. Jackson’s (2005) Social Psychological Model of Victimisation Worry](image)

*+/ - represent the hypothesised directions of relationships

**Figure 1.** Jackson’s (2005) Social Psychological Model of Victimisation Worry

Although this alternative conceptualisation of crime fear has been validated in many countries, it is yet to be tested with emerging technologies that are designed to gauge fear of crime in real-time/place. Specifically, it is unknown whether the quality of contemporary indicators of victimisation worry can be retained if they are derived from methods other than traditional paper-pencil surveys; and perhaps more importantly, whether alternative methods for collecting these measures can further our empirical understanding of the impact that place has on perceptions of crime, disorder, and victimisation risk.

**5.3.3 Fear of crime research methods.** Most of our empirical knowledge about individual’s fear of crime is derived from survey research. Unfortunately, paper-pencil surveys tend to produce data that lack ecologically valid information that is needed to assess fear of crime within a person’s natural environment (Gray et al., 2011; Pain, 2001). It is not clear, for example, whether individuals’ reactions to crime within the environment are stable
across time and different “places”, when paper-pencil methods are used (Solymosi et al., 2015). Likewise, most models designed to explain the processes behind crime fear and risk perception formation are tested using cross-sectional survey data—limiting conclusions that can be drawn about the stability of crime fear over time and different places (Jackson, 2005).

One possible way to resolve this issue is to measure fear of crime by conducting Ecological Momentary Assessments (EMAs) (Csikszentmihalyi & Larson, 1992). In the health, medical, and psychological sciences, EMAs are often administered as a Short Message Service (SMS) (i.e., text messages) that are sent to study participants’ mobile devices’ and designed to illicit feedback/responses while participants are in their natural settings. Alternatively, EMAs can be delivered to study participants as part of a mobile application. Several commercial applications exist that support EMA research, which are designed to test social behaviour using temporal and spatial sensors already built into smartphones. Because EMAs gather data from individuals while in their natural settings, they are capable of producing data with greater ecological validity, compared to retrospective paper-pencil surveys (Brewer, 2000).

EMA participation and completion rates tend to be relatively high, often ranging between 70% and 90%. These high rates of completion may be due, in part, to EMAs being relatively quick and easy to complete with mobile technology, which can also help reduce respondent fatigue and reactivity effects (Collins et al., 2003; Muessing et al., 2013). Empirical evidence also suggests that measures of concepts delivered through momentary assessments have strong concurrent and construct validity (Serre et al., 2012).

Despite the benefits of EMAs, some evidence suggests that self-selection bias may occur during participant recruitment and when respondents receive an EMA signal to record their data (Larson et al., 2002). Similarly, hard-to-reach populations such as the homeless or those without easy access to—or understanding of—modern technology may be difficult to
study. Additional training for participants and/or strategies that allow subjects to choose their preferred means of communication with researchers (e.g., texting versus emailing data) have been used in past research to ameliorate some of the problems associated with using EMAs to study unique populations (Muessing et al., 2013).

With respect to fear of crime research, there has been only one study to our knowledge that has used EMAs to assess reactions to crime and risk within the natural environment. This study was conducted by Solymosi et al. (2015) and consisted of a sample of six London residents. Solymosi and her colleagues developed the Fear of Crime Application (FOCA) and regarded perceptions of crime as an event that was situated in the individual’s immediate environment and personal activity space.

FOCA used temporal triggering logic to “push” surveys to participant’s mobile phones, during peak transportation times, in London. Using a single-item measure of “fear,” participants were asked how worried they were about crime in the present moment. If respondents indicated they were worried, they were asked to describe what type of crime they were worried about and to identify where they were worried by dropping a digital pin on a digital map. Results of this study suggest that fear of crime can be potentially mapped as a dynamic mode of perception and that worry about criminal victimisation changes as a function of time and place.

Although Solymosi et al. (2015) demonstrated that mobile devices can be used to test fear of crime within transportation journeys, important questions about the use of mobile technology to study fear of crime and risk perception remain, including a) the long-term feasibility of this approach, b) its application to an individual’s regular day-to-day movements, c) whether more sophisticated measures of victimisation worry can be delivered as part of momentary assessments, d) whether using additional built-in sensors to ping participants a survey (e.g., GPS) can produce reliable and valid spatial data about fear of
crime within local areas, and e) whether these data fit contemporary models of victimisation worry.

We argue that moving away from traditional measures of crime fear and paper-pencil survey methods may offer an improved understanding of the spatial and temporal factors that may affect risk/threat perception and fear of crime. However, to date, there remains little insight into the benefits and possible unintended consequences of using mobile technology to measure fear of crime and perceptions of risk across movements in time and place. Guided by the extensive body of literature on mobile EMAs in the health, medical, and psychological sciences, Solymosi and her colleagues (2015) have provided a useful mechanism for answering these shortcomings in relation to measuring context-dependent fear of crime—mobile apps. However, there remains limited insight into whether more ambitious retrospective measures of worry and risk can be administered using mobile technology.

5.3.4 Current study. Using mobile technology to deliver EMA’s of crime fear and risk perception, the present investigation begins to fill existing gaps in our knowledge about attitudes towards crime, with particular focus on the measurement of key constructs in real time and place. Specifically, this pilot study aims to examine whether mobile devices can be used to collect meaningful data about the spatio-temporal context of fear of crime and risk, by using alternative retrospective measures.

5.4 Methodology

A convenience sample of students \((N = 20)\) enrolled at an Australian university and who lived on the Gold Coast\(^2\) of Queensland volunteered for the pilot study designed to measure perceptions of crime in real time/place, using EMAs. Information about the study, how to download the smartphone app, and activate the EMAs was provided to each volunteer. Volunteers were required to use their own smartphone device\(^3\) and data plan; and were not incentivized to participate.
The app used GPS sensors built into participants’ smartphones to trigger the EMAs, based on their movements within the study area. A total of 10 locations were geofenced, representing various parts of the study area that participants were likely to travel (e.g., shopping centres, central business district, local beaches, etc.) during the three-month data collection period. Images of the mobile interface of the app are displayed in Figure 2. Participants were allowed to skip questions delivered during the EMA; and at the end of the data collection period, a total of 50 EMAs were submitted. Four were excluded from analysis due to a large number of incomplete responses.

*Figure 2.* Mobile Interface for Perceptions of Crime Survey Delivered Using Mobile App.

The smartphone app contained two data collection instruments. First, a pre-experiment demographic questionnaire was provided to volunteers once they activated the app on their smartphone. Second, a fear of crime instrument that included Jackson’s (2005) questions relating to perceptions of worry, likelihood of victimisation experience, consequences of victimisation, perceived control over crime, beliefs about the incidence of crime, and perceptions of the social and physical environment (incivility and social cohesion) was delivered as an EMA, when triggered by a participant entering a geofenced location.
Frequency of worry about personal victimisation was measured using a 4-item response set, where 1 indicates “Not once in the last month” and 4 corresponds to “Everyday” ($M = 1.57; SD = 0.60$). Likelihood of personal victimisation was measured on a 7-point scale, where only the endpoints were labeled: 1 = “Definitely not going to happen” and 7 = “Certain to happen” ($M = 3.04; SD = 0.96$). Attitudes about the consequences of personal victimisation were also measured on a 7-point scale, with only the endpoints labeled: 1 = “Not at all” and 7 = “To a very great extent” ($M = 4.70; SD = 1.66$). Using the same 7-point scale, participants’ were asked about the extent to which they had control over becoming a victim of a personal crime ($M = 3.42; SD = 1.52$). Finally, participants were asked how often they believed that crime would occur in the area during the next month (i.e., belief). A 4-point scale that ranges from 1 “Never in the next month” to 4 “Every day in the next week” was used to measure this dimension of fear ($M = 1.89; SD = 0.68$).

In order to assess perceptions of the participants’ proximate environment, seven questions were used to measure attitudes towards both physical and social incivility. Participants were asked how much of a problem they felt the following conditions were in the immediate area: (a) vandalism/graffiti; (b) rubbish in the streets; (c) dogs out of control/creating a mess; (d) drug-taking in the open; (e) drinking in the street; (f) teenagers hanging around; and (g) not enough things for young people to do. On average, study participants rated the areas around them 2.49 out of 4.00 ($SD = 0.52$), where 1 indicates incivilities are “Not a problem at all” and 4 indicates that they are “A very big problem”.

Seven questions were also used to measure informal social control and social capital (i.e., social cohesion). Participants were asked how much they agreed with the following statements: (a) the people who live here can be relied upon to call the police if someone is acting suspiciously; (b) if any of the children or young people around here are causing trouble, local people will tell them off; (c) if I sensed trouble whilst in this area, I could raise
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attention from people who live here for help; (d) this area has a close, tight-knit community; (e) this area is a friendly place to live; (f) this area is a place where local people look after each other; and (g) most people who live in this area trust one another. Using a 5-point Likert scale, where 1 corresponds to “Very strongly disagree” and 5 corresponds to “Very strongly agree,” on average, participants indicated that the area around them was somewhat socially cohesive ($M = 3.18; SD = 0.93$).

5.4.1 Analyses. In Jackson’s (2005) original study, scaling properties of his social-psychological process model of victimisation worry were assessed using Confirmatory Factor Analysis. Due to the sample size constraints in the current study, we were unable to estimate the full structural models of victimisation worry using this statistical technique. Instead, we produced reliability coefficients (Cronbach’s Alpha) to test the internal consistency of all scales used in the piloted mobile instrument. Cronbach’s Alpha is appropriate to use for small samples as it is calculated from the average correlation and the number of items included in the potential scale (Carmines & Zeller, 1979).

In addition to these reliability assessments, logistic regression models were estimated, to assess a) the effect that perceptions of the physical and social environment had on the probability of worrying about personal crime; and b) the hypothesised relationships between perceptions of threat (i.e., the likelihood, consequences, and control constructs) and their impact on the probability of worrying about three types of personal victimisation considered in the current study (i.e., being attacked, robbed/mugged, and harassed).  

Binary logistic regression was used due to sampling constraints. Preferred statistical tests, such as ordinal regression, were not possible given the sample size and the skewed distribution of some variables (i.e., worry about crime). To assist with interpretation of the first logistic regression model, semi-standardized beta coefficients were calculated using predicted probabilities as a reference point. These coefficients allow for an assessment of the
relative strengths of relationships involving variables measured in different metrics (see King, 2007). For the second model, our interpretation of findings is based on the odds ratios produced by the logistic regression model, as additional interpretation of semi-standardized beta coefficients with only dichotomous predictor variables cannot provide meaningful information about the relative strengths of relationships within the model (Menard, 2011).

In the first model, individuals’ perceptions of incivility and social cohesion within their immediate area were averaged by calculating the mean of all response alternatives for incivility and social cohesion indicators, respectively. For perceptions of incivility, the higher the average score, the more perceived incivility within the participant’s immediate area. For perceptions of cohesion, the lower the average score, the less perceived cohesion within the participant’s immediate area.

In the second model the five key dimensions of Jackson’s measures of victimisation worry were recoded into dichotomous variables by splitting the original scale for each dimension of the model at their mid-points (refer to Table 1 for coding labels). For example, the response alternatives for the likelihood of becoming the victim of a personal attack question were recoded so that participants who perceived an attack as 1 = Definitely not going to happen, through to a 3 on the scale were recoded into a 0 = Not Likely to be Victimised. In contrast, participants who responded with a 4 through to a 7 = Definitely going to happen were recoded into a 1 = Likely to be Victimised.

The dependent variable for both estimated models is frequency of worry. For the three personal crime indicators of worry about: being attacked, being robbed/mugged, and being harassed/threatened in the area, response alternatives were dichotomised so that any occurrence/event of worry about the different types of victimisation over the period of one month were recoded as a 1 = Worried about victimisation. Remaining participants who had not worried about being attacked, being robbed/mugged, and being harassed/threatened in the
area were coded as a 0 = Not worried about victimisation. Table 1 displays the labels for the binary variables used in the current study.

Table 1  
*Binary Recoding of Dimensions of Victimisation Worry for Logistic Regression Models*

<table>
<thead>
<tr>
<th>Model Dimensions</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Worry(^D)</td>
<td>0 = Not Worried About Being Victimised</td>
</tr>
<tr>
<td></td>
<td>1 = Worried About Being Victimised</td>
</tr>
<tr>
<td>Likelihood of Victimisation</td>
<td>0 = Not Likely to be Victimised</td>
</tr>
<tr>
<td></td>
<td>1 = Likely to be Victimised</td>
</tr>
<tr>
<td>Consequences of Victimisation</td>
<td>0 = Not Affected by Being Victimised</td>
</tr>
<tr>
<td></td>
<td>1 = Affected by Being Victimised</td>
</tr>
<tr>
<td>Control Over Victimisation</td>
<td>0 = Cannot Control Being Victimised</td>
</tr>
<tr>
<td></td>
<td>1 = Can Control Being Victimised</td>
</tr>
</tbody>
</table>
\(^D\) = Dependent Variable

5.5  **Results**

The reliability of Jackson’s (2005) measures was assessed using Cronbach’s Alpha to determine whether data measuring these dimensions are reliable when collected from participants using EMAs delivered on mobile technology. Table 2 presents the reliability coefficients, which indicate how closely related the set of items are as a group, for each dimension of Jackson’s model. Coefficients are produced for each of the three indicators of personal crime.

Table 2  
*Descriptive Statistics and Cronbach’s Alpha Coefficients for Personal Crime Model (N = 46)*

<table>
<thead>
<tr>
<th>Scale/Dimension</th>
<th>Min</th>
<th>Max</th>
<th>(M)</th>
<th>(SD)</th>
<th>(\alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry</td>
<td>1</td>
<td>3</td>
<td>1.57</td>
<td>0.60</td>
<td>.78</td>
</tr>
<tr>
<td>Likelihood</td>
<td>1</td>
<td>5</td>
<td>3.04</td>
<td>0.96</td>
<td>.87</td>
</tr>
<tr>
<td>Consequences</td>
<td>1</td>
<td>7</td>
<td>4.70</td>
<td>1.66</td>
<td>.89</td>
</tr>
<tr>
<td>Control</td>
<td>1</td>
<td>6</td>
<td>3.42</td>
<td>1.52</td>
<td>.99</td>
</tr>
<tr>
<td>Belief</td>
<td>1</td>
<td>3</td>
<td>1.89</td>
<td>0.68</td>
<td>.84</td>
</tr>
<tr>
<td>Incivility</td>
<td>1</td>
<td>3</td>
<td>2.49</td>
<td>0.52</td>
<td>.73</td>
</tr>
<tr>
<td>Social Cohesion</td>
<td>1</td>
<td>5</td>
<td>3.18</td>
<td>0.93</td>
<td>.91</td>
</tr>
</tbody>
</table>

*Note. N=46 reflects the number of location based surveys completed by respondents.*
As shown in Table 2, all dimensions of the social psychological model have good internal consistency/reliability (α > .75). In addition, measures used to gauge perceptions of the physical and social environment also have good-to-excellent internal consistency when delivered across multiple environments (e.g., incivility, α = .73 and social cohesion α = .91). Collectively, scaling properties of each measure of victimisation worry represented in Jackson’s model have good reliability, based on data collected using mobile EMAs.

Next, the hypothesised association between disorder, social cohesion, and worry about crime was tested using logistic regression. Table 3 provides results of logistic regressions examining the association between disorder and social cohesion on each indicator of personal victimisation worry.

Table 3
Logistic Regression Results of Incivility/Cohesion and Frequency of Worry About Personal Crime (N = 46)

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>b</th>
<th>SE</th>
<th>β</th>
<th>OR</th>
<th>Wald</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry About Attack&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivility</td>
<td>-0.18</td>
<td>.70</td>
<td>-0.02</td>
<td>.84</td>
<td>.07</td>
<td>.399</td>
</tr>
<tr>
<td>Social Cohesion</td>
<td>-1.22</td>
<td>.42</td>
<td>-0.27</td>
<td>.30</td>
<td>8.50</td>
<td>.002</td>
</tr>
<tr>
<td>Constant</td>
<td>4.08</td>
<td>2.35</td>
<td>--</td>
<td>--</td>
<td>3.03</td>
<td>.082</td>
</tr>
<tr>
<td>Worry About Robbery/Mugging&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivility</td>
<td>-0.92</td>
<td>.77</td>
<td>-0.12</td>
<td>.40</td>
<td>1.43</td>
<td>.116</td>
</tr>
<tr>
<td>Social Cohesion</td>
<td>-1.67</td>
<td>.50</td>
<td>-0.36</td>
<td>.19</td>
<td>11.02</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Constant</td>
<td>7.00</td>
<td>2.79</td>
<td>--</td>
<td>--</td>
<td>6.31</td>
<td>.012</td>
</tr>
<tr>
<td>Worry About Harassment&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivility</td>
<td>-0.57</td>
<td>.71</td>
<td>-0.07</td>
<td>.57</td>
<td>.63</td>
<td>.215</td>
</tr>
<tr>
<td>Social Cohesion</td>
<td>-1.28</td>
<td>.42</td>
<td>-0.29</td>
<td>.28</td>
<td>9.08</td>
<td>.003</td>
</tr>
<tr>
<td>Constant</td>
<td>5.44</td>
<td>2.47</td>
<td>--</td>
<td>--</td>
<td>4.29</td>
<td>.028</td>
</tr>
</tbody>
</table>

<sup>a</sup>Nagelkerke R² = .283; <sup>b</sup>Nagelkerke R² = .405; <sup>c</sup>Nagelkerke R² = .304
β = semi-standardized beta weight using the mean predicted probability of each DV outcome as a reference value.

As seen in Table 3, perceptions of incivility within the immediate area did not predict worry about any type of personal victimisation. Additionally, the odds ratios did not appear to be in the hypothesised directions of the model provided in Figure 1. For example, a one-unit increase in perceived incivility actually decreased the likelihood of worrying about being
attacked over the period of one month by 16%. Similarly, a one-unit increase in perceived incivility decreased the odds of worrying about being robbed/mugged over the period of one month by 40%. Finally, a one-unit increase in perceived incivility decreased the odds of worrying about being harassed, threatened or verbally abused over the period of one month by 43%.

In contrast, perceptions of social cohesion within participants’ immediate surroundings predicted worry about all types of personal victimisation that were measured—and odds ratios were in the expected directions. Additional inspection of semi-standardized coefficients in Table 3, indicate that perceptions of social cohesion—in comparison to incivility perceptions, are a stronger predictor of worry about personal victimisation. Specifically, a one-unit increase in perceived cohesion decreased the odds of worrying about being attacked in the area by 70%. Moreover, a one-unit increase in perceived cohesion decreased the odds of worrying about being robbed/mugged in the area by 81%. Finally, a one-unit increase in perceived cohesion decreased the odds of worrying about being harassed, threatened, or verbally abused by 72%.

Finally, the hypothesised associations between perceptions of vulnerability/appraisal of threat and frequency of worry about personal crime within the proximate environment were assessed. Table 4 provides results of the logistic regressions used to test the association between perceptions of vulnerability/threat and worry about crime for each indicator of personal victimisation.
Table 4

Logistic Regression Results of Vulnerability Model and Frequency of Worry About Personal Crime (N = 46)

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>$b$</th>
<th>SE$^b$</th>
<th>$\beta$</th>
<th>OR</th>
<th>Wald</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry About Attack$^a$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>0.73</td>
<td>0.80</td>
<td>0.09</td>
<td>2.08</td>
<td>0.84</td>
<td>.180</td>
</tr>
<tr>
<td>Consequences</td>
<td>2.01</td>
<td>0.77</td>
<td>0.24</td>
<td>7.49</td>
<td>6.88</td>
<td>.004</td>
</tr>
<tr>
<td>Control</td>
<td>1.07</td>
<td>0.72</td>
<td>0.13</td>
<td>2.91</td>
<td>2.23</td>
<td>.068</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.27</td>
<td>0.83</td>
<td>--</td>
<td>--</td>
<td>7.44</td>
<td>.003</td>
</tr>
<tr>
<td>Worry About Robbery/Mugging$^b$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>1.80</td>
<td>0.95</td>
<td>0.21</td>
<td>6.03</td>
<td>3.58</td>
<td>.029</td>
</tr>
<tr>
<td>Consequences</td>
<td>0.77</td>
<td>0.90</td>
<td>0.09</td>
<td>2.15</td>
<td>0.73</td>
<td>.197</td>
</tr>
<tr>
<td>Control</td>
<td>2.18</td>
<td>0.86</td>
<td>0.26</td>
<td>8.83</td>
<td>6.40</td>
<td>.005</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.71</td>
<td>1.05</td>
<td>--</td>
<td>--</td>
<td>6.71</td>
<td>.005</td>
</tr>
<tr>
<td>Worry About Harassment$^c$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>1.92</td>
<td>0.85</td>
<td>0.24</td>
<td>6.81</td>
<td>5.04</td>
<td>.013</td>
</tr>
<tr>
<td>Consequences</td>
<td>1.03</td>
<td>0.79</td>
<td>0.13</td>
<td>2.80</td>
<td>1.69</td>
<td>.097</td>
</tr>
<tr>
<td>Control</td>
<td>1.56</td>
<td>0.76</td>
<td>0.20</td>
<td>4.77</td>
<td>4.22</td>
<td>.020</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.44</td>
<td>0.97</td>
<td>--</td>
<td>--</td>
<td>6.30</td>
<td>.043</td>
</tr>
</tbody>
</table>

$^a$Nagelkerke $R^2 = .301$; $^b$Nagelkerke $R^2 = .308$; $^c$Nagelkerke $R^2 = .279$

$\beta$ = semi-standardized beta weight using the mean predicted probability of each DV outcome as a reference value.

As seen in Table 4, all but two of the dimensions significantly predicted the probability of being worried about a particular type of personal victimisation at the $\alpha < .10$ level, with exception to the likelihood of victimisation predicting whether participants reportedly worry about being attacked and the consequences of victimisation predicting whether participants reportedly worry about being robbed or mugged ($b = .77, p = .180; b = .73, p = .197$, respectively).

When looking at individual dimensions of risk perception and vulnerability and their effect on worry about specific types of personal crime in the immediate area, it can be seen in Table 4 that those who believed that harassment was likely in an area had an increased likelihood of being worried about harassment over a period of one month ($OR = 6.81$). Similarly, those who believed that they would be affected by harassment in the immediate location had an increased likelihood of being worried about this type of victimisation over a
period of one month ($OR = 2.80$). However, inconsistent with Jackson (2005), those who perceived they had control over becoming the victim of harassment within the area had a higher likelihood of being worried about harassment over a period of one month ($OR = 4.33$). Results of all remaining logistic regression models for worry about personal attack and worry about robbery are provided in Table 4.

5.5.1 Placing fear of crime. Rather than triggering surveys at time points, the current study set out to use mobile GPS sensors to trigger surveys to participants when they entered a specific location or area. Unfortunately, this alternative method for collecting spatial information about fear of crime and disorder patterns was not feasible. There were two noteworthy reasons for our inability to execute this aspect of our study design. First, our sample size was not sufficient to conduct spatial analyses on fear of crime, given the number of completed and returned EMAs.

Second, we were unable to group all respondents who were pinged as a result of entering the geofenced locations into one group, in order to represent one unique “place”. Theoretically, this is important because in the current study “place” is defined by a physical location within a pre-defined area—however, there may be significant spatial and temporal variability between participants who submit a survey within the same pre-defined area. Thus, participants who responded to the EMAs in the same location may have had contrasting opinions of the environment they were in (i.e., an individual may perceive the location as their neighbourhood, and another as a less familiar public space), and this may have subsequently affected their perceptions of crime and other local problems within that area. We discuss alternative avenues for exploring place and its potential relationship with fear of crime using mobile technology in the discussion section below, based on our findings, and existing research on the geography of place.
5.6 Discussion

This pilot study explored the feasibility of using mobile devices to collect information about context-specific fear of crime. Results of our pilot investigation indicate that some dimensions of victimisation worry are significant predictors of worry about personal crime, while others are not. Further confirmatory studies are needed to explore the associations between dimensions of the model that are not consistent with how these associations have been documented in past studies (Jackson, 2005; Chataway & Hart, 2016).

First, we found that retrospective measures of worry are reliable when delivered on smartphones. Our results indicate that the five dimensions of victimisation worry, as well as indicators of incivility and social cohesion within a particular area, have good internal consistency and reliability. This mirrors previous work by Chataway and Hart (2016), who found strong support for the reliability of Jackson’s (2005) model of victimisation worry when tested using paper-pencil survey methods in Australia.

Second, the current results suggest that risk perception formation and appraisal of threat in reference to personal crime victimisation is represented by the combination of two unique factors of the social-psychological model of victimisation worry—the likelihood of victimisation and the consequences of victimisation. Although the strength and significance of these two factors (likelihood and consequences) on worry about crime varies depending on the type of personal crime measured, our findings are somewhat consistent with previous work by Jackson (2009), who has tested the underlying features of risk perception formation.

However, our logistic regression models indicate that the relationship between perceived control over crime and frequency of worry is in the opposite direction to what has been hypothesised in Jackson’s (2005) model. That is, the odds of being worried about personal crime within an area were found to be higher for those who perceived they had control over personal victimisation. This may be a consequence of the EMA approach, given
that paper-pencil surveys using Jackson’s measures in the Australian context have supported the hypothesised direction of the control-worry relationship (see Chataway & Hart, 2016). These disparate findings may be due to the paper-pencil approach being cross-sectional in nature, and restricted to the participant's own neighbourhood. Thus, we may find that when asked about control over victimisation across a number of places people may respond differently than when asked to generalize such perceived experiences within their own neighbourhood. However, further confirmatory studies are needed to explore the control-worry relationship with larger samples using the EMA approach.

Third, results of the current study suggest that indicators of incivility do not appear to significantly influence worry about different types of personal crime, but perceptions of social cohesion in an area do. This finding is somewhat inconsistent with the literature on fear of crime; and more specifically, the strong positive associations that have been noted between highly disordered environments and fear of crime in past empirical investigations (Brunton-Smith & Sturgis, 2011). Due to the small sample size in the current study, we caution this finding and suggest once again that larger confirmatory studies using the EMA approach are needed to test this hypothesised relationship between incivility and worry about crime.

5.6.1 Limitations. The current study demonstrated that retrospective measures of victimisation worry could be administered using mobile devices; however, a number of challenges were identified. First, we found that triggering participant’s surveys based on their location (rather than time), produced data that was not conducive to robust spatial analysis. Therefore, we argue that researchers interested in using mobile devices to measure fear of crime in the natural environment rethink what is meant by the term “place”. As Solymosi et al (2015) argues, “it is important to consider fear of crime events at the smallest possible
scale to be able to un-erroneously associate them with elements of the environmental backcloth such as incivilities, crime, and disorder” (p.198).

One way to “tease out” the effect place may have on fear of crime, is to ask respondent’s questions about the “place” in which they are currently located, in addition to estimating the specific geographical coordinates of that particular place. Specifically, questions might ask how familiar participants are with the current location (i.e., their awareness space) (Brantingham & Brantingham, 1984), do they feel generally anxious within this location, and how often do they frequent this place.

For example, an individual may feel quite comfortable in a semi-private place that is not necessarily their home, but has meaningful significance to them such as their place of work. Thus, they may be more likely to notice small irregularities/peculiarities (i.e., a person or object that looks out of place) within this familiar environment—in turn this may affect their concerns for safety and levels of perceived risk posed by crime (Innes, 2004). Future work could collect this more detailed EMA data on perceptions of place to explore a) how fear of crime differs among perceived places (i.e., home, school, work, and public spaces); and b) how familiarity/attachment with these places affects fear of crime and other related constructs (i.e., disorder and place-dependent anxiety).10

Second, although we found that retrospective measures of victimisation worry could be administered using mobile devices, the sample size in the current study did not allow us to accurately examine the stability of the various dimensions of worry over the course of time. Thus, larger confirmatory studies are needed to investigate possible temporal features of victimisation worry. More importantly, despite finding that retrospective indicators of victimisation worry used in the current study have good reliability and internal consistency, we support Solymosi and her colleagues’ (2015) assertions that retrospective questions
provide a static picture of an event that has occurred in the past, and that future work might consider adopting momentary measures of fear of crime and risk.

We hope the current study will lead to future research exploring place-based perceptions, and more specifically research that expands original process models of victimisation worry (i.e., Jackson’s 2005 model) to a momentary approach. This is especially important, considering the relationships found between risk perception (likelihood of victimisation and consequences of victimisation) and context dependent worry about crime in the current study, and other research (Jackson, 2009). Adapting these process models of victimisation worry to a momentary event-related model of fear of crime may provide a clearer picture of the underlying psychological processes behind fear of crime and risk when it is experienced within the proximate environment.

5.6.2 Conclusion. The current pilot study aimed to advance our existing understanding of the relationship between place and fear of crime, by testing alternative measures of crime fear using mobile technology. We argue that criminologists and researchers-alike need to move away from traditional measures of fear of crime (i.e., perceptions of safety questions, and single item measures), that are collected using paper-pencil surveys, so that a better insight into the spatial and temporal factors that may affect risk perception formation and fear of crime within the proximate environment can be established. Our pilot study confirms that mobile devices may be a reliable alternative to measuring fear of crime, and some aspects of retrospective worry about crime in particular—within the immediate environment. It is suggested that researchers should make use of this relatively cost effective, and reliable data collection tool for measuring complex social phenomena, such as fear of crime, and disorder perceptions. The more that we know about fear of crime events, and how the environmental backcloth interacts with an individual’s
specific movements within time and place, the better informed our interventions will be that are designed to reduce the prevalence of fear of crime in the community.

ENDNOTES

1 Here “ecological validity” refers to the extent to which results from surveys can be generalised to everyday life and social actions (Shiffman, Stone, & Hufford, 2007).
2 The Gold Coast is located in Southeast Queensland, Australia. It is the second most populous city in the state, with approximately 537,844 residents (ABS, 2011). The Gold Coast covers about 1,379km².
3 The app used to collect information about attitudes towards crime was only available on the iOS platform (i.e., Apple mobile devices). In January 2016, it was estimated that the iOS operating system had a market share of 41.2% in Australia.
4 Analysis was restricted to 10 geofenced locations on the Gold Coast. Apple’s regulatory requirements for mobile apps that use spatial triggering limit the number of geofenced locations to 20. The other 10 geofenced locations were retained for use in another survey delivered using the same app platform. Due to the nature of the study, we were unable to report participation/completion rates for these geofenced locations. As this this was a pilot fear of crime study to test spatial triggers for delivering EMAs, we recommend that future research utilising the same design strategy record the number of geofenced pings received, and subsequent responses by location points.
5 In contrast to Jackson’s (2005) original questionnaire, retrospective questions were framed in relation to the participant’s geofenced location, rather than their neighbourhood. Furthermore, we chose to only examine fear of personal crime within reference to the participant’s location at the time of the survey. Specifically, three indicators of personal victimisation were examined: a) being attacked in the area; b) being robbed or mugged in the area; and c) being harassed, threatened, or verbally abused in the area.
6 In general, a small sample size limits the level of power, precision and confidence that we have in our sample estimates and may result in large standard errors, and wide confidence intervals. However, we have made it clear that our findings have been produced from a hypothesis-generating study and that a larger confirmatory study is still needed (Hackshaw, 2008).
7 This approach to dichotomisation of quantitative variables is a common approach within the social sciences for assessing group differences (see MacCallum et al., 2002)
8 The level of analysis for the current study is the situation in which individuals were surveyed. The authors recognise that future work is required to tease out the concepts of ‘situational fear’ from ‘dispositional fear’ that is driven by trait anxiety.
9 The control-worry relationship was in the opposite direction to the hypothesised model for all indicators of personal victimisation. We explore possibilities for this finding in the discussion section.
10 Another avenue of future research may be to test the effect psychological distance has on context dependent fear of crime, specifically the dimensions of temporal and spatial distance, which can be easily captured with EMA techniques (Gousetti, & Jackson, 2015).
5.7 References


Retrieved on 21 March 2014 from


5.8 Chapter Summary

Chapter 5 presented findings from a pilot study (Study 2) using mobile technology to collect context-dependent data on fear of crime. The main aim of this paper was to examine whether mobile apps could be used to gather meaningful information about fear of crime within the local environment, thereby answering research question three. Results presented in Chapter 5 indicated that this approach to collecting data about fear of crime in the natural environment was feasible and reliable. However, it was argued that there are some considerations that should be made in relation to future revisions or development of apps that test fear of crime in the local environment. These recommendations guide the final study (Study 3) and the manuscript to be produced from it.

It was argued that using spatial triggering logic to deliver EMAs on fear of crime does not allow researchers to accurately examine within-subject variation in worry about crime. This is due to the fact that ping locations selected in the pilot study represent arbitrary geographical locations, making it difficult to determine how a respondent’s perceptions of the immediate area affected their feelings of safety and overall perceptions of victimisation risk (see Chapter 5, Section 5.5.1).

Moreover, it was proposed that one effective way to deal with this issue is to develop apps that use temporal triggering logic; thereby reconceptualising the idea of place to include a participant’s own self-reports about their activity space (e.g., whether they are at home, or at the shopping centre, and so forth). This allows researchers to potentially examine within-subject variability in fear of crime by recording the spatial location of the respondent at the time of surveying, along with data about the activity they are engaging in at the time of surveying. It was argued that this approach will produce more reliable and spatially valid data about fear of crime in the local environment, and is also in line with previous work that
has used EMAs in the context of verifying people’s accounts of their day-to-day activities (Solymosi et al., 2015).

Finally, in addition to reconceptualising our understanding of place and triggers of EMA surveys, it was recommended that future research evaluate momentary fear of crime measures. As Solymosi et al. (2015) argue, existing retrospective measures of fear of crime present a static picture of an event that has occurred in the past. At present, the established social-psychological process model of victimisation worry tested in Chapters 2 through 5 includes a mixture of retrospective and momentary questions. The model is yet to be extended to a complete momentary model that better fits the mobile app-driven methodology.

The previous chapters of this dissertation have shown that the established social-psychological process model of victimisation worry is reliable and valid using data collected from Australian samples (Chapter 2); that new knowledge can be produced from the validated model (Chapters 3 and 4), and that mobile technology can be leveraged to collect more ecologically valid information about fear of crime using the contemporary fear of crime measures contained in the victimisation worry model (Chapter 5). This work lays the foundation for further advancements to be made to first generation models of victimisation worry. Specifically, the existing model of victimisation worry conceptualises worry about crime retrospectively (i.e., worry is gauged by asking respondents to reflect back on events of crime and disorder that have occurred over the period of one month). This has limited our knowledge of how concerns relating to crime and disorder are associated with events that occur in the proximate environment of an individual. Moreover, researchers still do not know how factors such as momentary risk perception affect immediate concerns about criminal victimisation, and if these theoretical relationships are the same as the first-generation models of fear of crime tested in Europe (Jackson, 2005) and now in Australia (see Chapters 2 through 5).
Based on the findings presented in Chapters 2 through 5, the final study of this dissertation proposes a new momentary model of victimisation worry. The new momentary model of victimisation worry considers the interactions between time, place and psychological state, risk perception, and momentary fear of crime. Guided by the findings of Study 2, the new model aims to better capture the social-psychological ‘process’ of fearing crime, by reconceptualising fear as an event that occurs within the ‘here and now’, opposed to a set of experiences or remembered events of crime and disorder that have occurred over a long period of time (see Chapter 5, Section 5.6.1).

The final study addresses the following research question: *Can momentary models of fear of crime be developed to consider interactions between time, place, and psychological states; and if so, how can these new theoretical models inform our existing knowledge of the social-psychological processes of fearing crime?* The model is developed from data collected using a new mobile app (MetricWire). Based on the findings of Study 2, modifications to the triggering logic of the survey to respondents, the use of momentary measures, and measures of place perceptions were introduced in Study 3. Results of Study 3 are presented in the form of a manuscript in Chapter 6.
CHAPTER 6: THE SOCIAL-PSYCHOLOGICAL PROCESS OF FEARING CRIME: DEVELOPING A NEW MOMENTARY MODEL OF VICTIMISATION WORRY USING MOBILE TECHNOLOGY

This chapter includes a co-authored paper submitted for review. The bibliographic details of the co-authored paper, including all authors, are:


My contribution to the paper involved:

As first author of the current manuscript I was responsible for the redevelopment of the survey instrument to be delivered using an alternative commercial app platform—MetricWire. I was solely responsible for recruiting participants for the study using targeted social media advertisements. Myself and Dr. Hart worked on the analyses together for the current paper, given the complex nature of the data. I wrote all sections of the manuscript, with my supervisors providing feedback in the final editing stage before submission of the manuscript.

(Signed) ______________________________ (Date) 23rd February 2018
Michael Chataway (Corresponding Author)

(Countersigned) ______________________________ (Date) 23rd February 2018
Supervisor: Dr. Timothy C. Hart
6.1 Abstract

The current study describes and tests a new momentary model of victimisation worry, based on data collected from a smartphone app. We assess whether a momentary model provides further insight into the situated nature of fear of crime and risk perception. Data were collected from a sample of young adults living in Southeast Queensland, Australia who completed momentary surveys on fear of crime ($N = 499$) that were administered on their mobile devices. Results suggest that constructs contained in our proposed momentary model of victimisation worry fit the data appropriately and that associations between dimensions of victimisation worry are all statistically significant based on their expected directions (i.e., increased perceptions of victimisation risk in the immediate area significantly predicts increased momentary worry about crime). We conclude with a discussion of the theoretical and practical implications of our findings, limitations of the current study, and direction for future research.
6.2 Introduction

Fear of crime has been of significant interest to scholars for decades, yet the current state of measurements and methods used to examine perceptions of crime within an individual’s natural environment are limited. In response, the present study investigates the context-dependent nature of victimisation worry as it is experienced within the proximate environment of young people. We build on existing scholarship using data collected from smartphone apps designed to measure fear of crime (e.g., Solymosi et al. [2015] and Chataway et al., [2017]) while study participants engage in their everyday routine activities. From these data, we propose a new momentary model of victimisation worry. This model includes multiple dimensions of fear of crime, perceptions of disorder/social cohesion perceived in the proximate environment, and an individual’s momentary psychological state. In doing so, we advance existing social-psychological models of victimisation worry found in the contemporary fear of crime literature (e.g., Jackson, 2005).

We begin our article with a discussion of the criminology of place, and why it is important to test the spatial and temporal distribution of fear of crime. Next, we discuss how researchers have measured fear of crime previously, focusing specifically on question items, methods, and models used to inform our current understanding of fear of crime and related constructs (e.g., risk perception). From this discussion, we outline key shortcomings of this literature, which inform the current investigation, and present our momentary model of victimisation worry. This is followed by a description of the methods used test the model and the results of our assessment of it. Finally, we discuss the implications and limitations of the present study, with specific focus on how scholars and policy makers can utilise information collected from participants about their momentary attitudes towards crime and victimisation risk in the future.
6.3 Literature Review

6.3.1 Measuring fear of crime in time and place. Criminologists and social scientists have long been interested in the spatial and temporal features of crime. Like crime events, individuals’ perceptions of crime have been found to vary across time and space (Fisher & Nasar, 1995). To better understand the spatio-temporal features of fear of crime, scholars have called for more location specific studies. Although some scholars have responded to this call (Ferraro & LaGrange, 1987; Fisher & Nasar, 1995; McCrea et al., 2005; Wyant, 2008), extant research highlights key weaknesses of traditional measures used to understand fear of crime and risk perception in place and time.

Previous research has employed different measures to describe and assess fear of crime, including those that capture perceptions of safety, intensity of victimisation experiences, and frequency of worry about crime. Unfortunately, these measures typically do not allow for an accurate assessment of the spatio-temporal features of fear of crime. For example, scholars have suggested that perceptions of safety questions (i.e., “How safe do you feel walking alone in this area at night?”) do not measure concrete fearful reactions to crime events, and fail to account for spatial variability in perceptions of safety and risk (Hale, 1996). Moreover, questions that aim to summarize the intensity of victimisation assume that fear of crime is stable over time and in different situations, but this is not the case (Gray et al., 2008).

More refined question items measuring frequency of worry aim to resolve some of the issues associated with traditional fear of crime measures. These questions ask respondents to reflect back on a period in time where they felt worried, concerned, or fearful about falling victim to a particular type of crime (Farrall & Gadd, 2004; Jackson, 2005). Although studies have demonstrated the reliability and validity of frequency questions (Chataway & Hart, 2016, 2017; Chataway et al., 2017; Gray et al., 2010; Jackson, 2005; Tseloni & Zarafonitou,
some scholars suggest that these types of questions present a static picture of an event that is not in the “here and now” (Solymosi, et al., 2015). Moreover, asking people about the frequency with which they worry about crime, retrospectively, may produce errors in recall. Therefore, it is recommended that researchers assess whether reliable information about fear of crime can be retrieved from questions that ask individuals about their levels of worry in the present moment/situation as this could provide more ecologically valid information about fear of crime and risk perception.

### 6.3.2 New methods used to capture fear of crime in time and place.

In order to improve how we measure fear of crime in the here and now, we require methods capable of collecting valid and reliable fine-grain spatial and temporal data from individuals. Until recently, researchers have relied on longitudinal paper-pencil survey data to understand spatial and temporal variability in fear of crime. However, with the rapid development of technology, especially mobile technology, researchers have begun exploring the feasibility of collecting context-dependent data on fear of crime using smartphone devices. This approach to momentary data collection is consistent with methodologies referred to as Ecological Momentary Assessments (EMAs) (Collins et al., 2003) in other disciplines.

Only two known studies have examined whether mobile technology can be leveraged to collect meaningful information about context-dependent fear of crime (Chataway et al., 2017; Solymosi et al., 2015). First, Solymosi and her colleagues developed the Fear of Crime Application (FOCA) to determine whether fear of crime could be mapped as a context-dependent everyday experience that varied in time and place. Six participants living in London, England were asked to download the FOCA app and report their feelings of worry during their daily activities. Data collection lasted for one month. During this time, participants were “pinged” up to four times a day at random times, within peak travel, and asked about their levels of fear of crime. The app used a single item measure of momentary
worry (i.e., how worried are you about falling victim to a crime in the present moment). Data showed that attitudes towards crime were dynamic, changing within persons, across places, and during different times. Between-participant variation was also observed. In other words, the researchers determined that participants did not perceive an entire neighbourhood as safe or unsafe, but that specific places within neighbourhoods, at specific times, were viewed differently.

Second, Chataway et al. (2017) used a smartphone app to gauge victimisation worry among a sample of college students. Measures used in this study were retrospective in nature and referenced worry over the previous month. The authors suggest that delivering retrospective measures of victimisation worry, using mobile devices, may provide a clearer picture of fear of crime and its stability over longer periods of time and address some of the limitations of Solymosi’s FOCA study (Leitner & Kounadi, 2015). In contrast to Solymosi’s research, the fear of crime surveys administered by Chataway et al were triggered based on the participant’s physical location. Chataway and colleagues found that measures of victimisation worry were reliable when delivered using mobile technology and that important associations between dimensions of victimisation worry could be replicated using data collected from this type of technology.

Collectively, both studies provide insight into how mobile technology can be used to examine context-dependent fear of crime. However, limitations remain with respect to this approach. For example, Chataway et al. (2017) notes that researchers must carefully consider how fear of crime surveys are triggered to respondents via mobile phones, as the type of triggering used (i.e., spatial triggering) may not provide reliable data for spatial analyses. They propose that researchers use temporal triggering logic in future studies and encourage researchers to ask more detailed questions about the place where the respondent is located at
the time a survey is administered, in order to assess the influence of the physical and social environment on fear of crime.

6.3.3. **New theoretical perspectives of fear of crime in time and place.** Mobile technology has recently been leveraged to collect context-dependent fear of crime data, but theoretical models recognising the momentary nature of attitudes towards crime have yet to be developed. Momentary models of fear of crime would contribute significantly to our existing knowledge on the social-psychological processes involved in fearing crime by enabling researchers to determine what individual- and situational-level factors are important for driving momentary worry about crime and victimisation risk.

Jackson’s (2005) social-psychological model of victimisation worry provides a foundation from which a momentary model of victimisation worry can be developed. His model includes a range of distinct, but related, constructs that constitute fear of crime: the likelihood of victimisation, the perceived consequences of victimisation if it were to occur, levels of perceived control over crime and beliefs about the prevalence of crime (Figure 1). Collectively, these constructs reflect the interplay between emotion, risk perception, and environmental perception.

These five dimensions of Jackson’s (2005) model are presented in Figure 1 and represent an individual’s appraisal of threat and are directly linked to existing research on vulnerability and fear of crime (Killias, 1990). For example, research has shown that perceptions of victimisation risk are a significant predictor of worry and anxiety about crime (Jackson, 2009) and that varying levels of risk perception may account for individual differences in fear of crime in respect to gender (Farraro, 1996; Schafer et al., 2006) and age (LaGrange & Ferraro, 1989).
Note. + / - indicates the directions of hypothesised relationships in the model.

Figure 2. Jackson’s (2005) Social Psychological Model of Victimisation Worry

According to Jackson’s model, an individual’s cognitive appraisal of threat is further mediated by their assessment of the physical (incivilities) and social (community cohesion) environment. Both of these features of the environment have been shown to significantly affect individual’s fear of crime; specifically, individuals who are fearful of crime have been found to consistently report higher levels of perceived incivility within their neighbourhoods (Brunton-Smith & Sturgis, 2011; Wyant, 2008). Researchers have also found strong mediational links between the key features of vulnerability contained in Jackson’s model (i.e., perceived victimisation risk) and incivility perceptions (LaGrange et al., 1992; Jackson, 2009). More contemporary work has also supported this finding, suggesting that neighbourhood level differences in incivilities can be linked to neighbourhood fear through shared views about victimisation risk (Wyant, 2008). Jackson’s original model is presented in Figure 1 showing the hypothesised connections between each construct.

Retrospective frequency questions were originally used to measure each dimension of Jackson’s (2005) model; and, no known research has aimed to expand the measurement
model further to include indicators that consider a person’s proximate environment (i.e., questions that specifically ask about individual’s levels of worry within their current location). Such advancements in the model could allow researchers to address shortcomings of methods and measures used to examine context-dependent fear of crime and provide a unique picture of how hypothesised relationships within original social-psychological process models explain individuals’ attitudes towards crime.

In addition, Jackson’s (2005) original model does not contain variables measuring dispositional states of an individual and their interaction with perceptions of place (i.e., incivility and social cohesion), despite it being a “social-psychological” model. We argue that adding measures of momentary psychological state to a momentary victimisation worry model provides further insight into how predisposed psychological characteristics of an individual may influence their immediate perceptions of place and subsequent fear of crime and risk perception. This would align with existing research exploring the connections between mood and affective states and fear of crime (e.g., Gabriel & Greve, 2003; Stafford et al., 2007). Furthermore, we propose that psychological factors within a person may shape their judgments of risk, fear of crime, and perceptions of the physical and social environment; but to date, no known empirical study has attempted to examine these interactions.

6.3.4 Current study. The current study advances existing models of victimisation worry by introducing new measures of momentary fear of crime collected from a smartphone app. We also add to the existing fear of crime scholarship by assessing how momentary psychological state—specifically mood—affects immediate perceptions of the physical and social environment and subsequent worry about crime, using a new momentary model of victimisation worry.
6.4 Methodology

6.4.1 Data and sample. Data for the current study were collected from a sample of young adults living in southeast Queensland, Australia. Study participants were recruited through an online social media advertising campaign on Facebook and Instagram newsfeeds from 21 April through 13 May 2017. Study participants were required to download a free app and complete a pre-experiment questionnaire. The participants were required to use their own data plan in order to be eligible for the study. During the 3-month data collection period, study participants were issued EMAs that included a fear of crime instrument (outlined below). In total, participants completed 499 EMAs. A total of 82% of enrollees remained in the study for the full 3-month period.

6.4.2 The mobile application. The mobile application used to collect context-dependent information on fear of crime was developed by MetricWire (2017), a cloud based data collection and analytics platform that allows users to log, analyse, and visualise data collected from smartphones, tablets, and the web. Fear of crime EMAs were triggered on participants’ smartphones through the MetricWire app using temporal triggering logic. Specifically, surveys were sent every three days, at two random time points, with a 5-hour interval in between each time-point. It is important to note, that there is no agreement among researchers on the number of time-points that should be used to trigger EMAs during a single day (Shiffman, 2009).

6.4.3 Data collection instrument. The smartphone app contained two data collection instruments. First, as mentioned previously, a pre-experiment demographic questionnaire was provided to volunteers once they enrolled in the study and activated the MetricWire app on their smartphones. The following information was collected from participants: gender, age, housing tenure, Aboriginal/Torres Strait Islander status, and type of device used. Demographic characteristics of participants are included in Table 1.
Second, the fear of crime instrument contained momentary measures of victimisation worry adapted from Jackson (2005). These included momentary measures of worry, belief, consequences, control, and likelihood. Momentary worry about crime was assessed by asking the participant, “How worried are you about the following, in your current location?” Response alternatives for the current question were: 1 = Not at all worried; 2 = Not very worried; 3 = Fairly worried; and 4 = Very worried ($M = 1.76, SD = 0.59$). Perceptions of victimisation likelihood were measured by asking the participant, “How likely do you think it is that you could fall victim to the following, in your current location?” Response alternatives were labeled only on the endpoints, where 1 = Definitely not going to happen and 7 = Definitely going to happen ($M = 2.56, SD = 1.02$). Similarly, momentary threat perception (i.e., appraisal of threat) was assessed with indicators of momentary perceptions of the consequences of victimisation experience, which was gauged by asking participants, “To what extent would your life be affected if you experienced the following, in your current location?”
location?” Only the endpoints of the response alternatives were labeled, where 1 = Not at all and 7 = A very great extent ($M = 4.98, SD = 1.47$). Momentary perceptions of control over criminal victimisations were measured by asking the participant: To what extent do you feel you have control over whether you will become a victim of the following, in your current location. The same scale was used for the control question item, where 1 = Not at all and 7 = A very great extent ($M = 4.06, SD = 1.51$). Finally, participants’ beliefs about the prevalence of crime within the immediate location were measured by asking, “During the next month, how often do you think the following will occur, in your current location?” Response alternatives for the current question consisted of: 1 = Never in the next month; 2 = 1-2 times in the next month; 3 = 1-2 times in the next week; and 4 = Every day in the next week ($M = 1.70, SD = 0.60$).

Perceptions of the physical and social environment were measured using two momentary indicators of area incivility and social cohesion. Participants were asked how much of a problem they felt the following nine conditions were in the current location: (a) vandalism/graffiti; (b) rubbish in the streets; (c) dogs out of control/creating a mess; (d) drug-taking in the open; (e) drinking in the street; (f) teenagers hanging around; (g) not enough things for young people to do; (h) people urinating in public; and (i) people hooning or driving erratically in the area. On average, study participants rated the areas around them 1.99 out of 4.00 ($SD = 0.66$), where “1” indicates incivilities are “Not a problem at all” and “4” indicates that they are “A very big problem”.

Seven questions were used to measure informal social control and social capital (i.e., social cohesion). Participants were asked how much they agreed with the following statements: (a) the people who live or frequent here can be relied upon to call the police if someone is acting suspiciously; (b) if any of the children or young people around here are causing trouble, locals or people who frequent here will tell them off; (c) if I sensed trouble
whilst in this area, I could raise attention from people who live or frequent here for help; (d) this area feels like it is a close, tight-knit community; (e) this area is a friendly place to live; (f) this area is a place where locals or people who frequent the area look after each other; and (g) most people who live in or frequent this area trust one another. Using a 5-point Likert scale, where “1” corresponds to “Very strongly disagree” and “5” corresponds to “Very strongly agree,” on average, participants indicated that the area around them was somewhat socially cohesive ($M = 3.39; SD = 0.84$).

Consistent with previous research (e.g., Chataway et al., 2017; Jackson, 2005, 2009, 2013), we measured fear of personal crime using three unique crime types: being attacked in the immediate location; being robbed/mugged in the immediate location and being harassed, verbally abused, and/or threatened in the immediate location. According to Jackson (2005), these three crime types, collectively, represent fear of personal crime. Many cross-national studies support the methodological rigor of this personal crime model (Chataway & Hart, 2016; Jackson, 2005, 2009, 2013).

Finally, participants’ momentary psychological state was assessed using the Positive Affectivity and Negative Affectivity Scale (PANAS) (Watson, Clark, & Tellegen, 1998). The PANAS consists two 10-item scales measuring positive and negative affective states. Participants were asked to indicate the way they felt in the present moment using an “I feel” statement for the following positive affect items: (a) attentive; (b) active; (c) alert; (d) excited; (e) enthusiastic; (f) determined; (g) inspired; (h) proud; (i) interested; (j) strong ($M = 2.03; SD = 0.82$); and for the following negative affect items: (k) hostile; (l) irritable; (m) ashamed; (n) guilty; (o) distressed; (p) upset; (q) scared; (r) afraid; (s) jittery; and (t) nervous ($M = 1.35; SD = 0.54$). The response alternatives for both the positive and negative affectivity question items were labeled with 1 = “Very slightly or not at all”; 2 = “A little”; 3 = “Moderately”; 4 = “Quite a bit”; and 5 = “Extremely”.
6.4.4 Analytic strategy. In order to test the momentary model of victimisation worry, results are presented in two stages. First, we produce reliability coefficients (Cronbach’s Alpha) to examine the internal consistency of all scale items used in the momentary model. Cronbach’s Alpha is calculated from the average correlation and the number of items included in the potential scale, allowing the researcher to determine the reliability of each scale (Carmines & Zeller, 1979). Second, we examine the momentary model of victimisation worry using Structural Equation Modelling. Models were estimated using Maximum Likelihood Estimation procedures in IBM SPSS and Analysis of Moment Structures. We test the measurement model and path coefficients using SEM because it allows for model constructs to be tested simultaneously and is more robust than multiple regression techniques.

Figure 2 illustrates the relationships implied by the proposed momentary model of victimisation worry, which includes momentary psychological states of positive and negative affectivity, and immediate risk perception/appraisal of threat. We evaluated this model first by assessments of model fit, using agreed upon fit statistics for SEM. Next, model coefficients between measures of psychological state (i.e., positive and negative affectivity) and perceptions of place (i.e., incivility and social cohesion) were derived. Finally, we evaluated the model coefficients for the remaining momentary dimensions of risk perception and appraisal of threat.
Note. +/- indicates the directions of hypothesised relationships in the model.

Figure 2. Momentary Model of Victimisation Worry Adapted from Jackson (2005)

6.5 Results

6.5.1 Construct Reliability. Table 2 presents the reliability coefficients of the proposed momentary measures of victimisation worry, which indicate how closely related the set of items are as a group, for each dimension of the proposed model. These findings show that all dimensions of the momentary social-psychological model of victimisation worry have very good internal consistency/reliability ($\alpha > .80$). Measures used to gauge perceptions of the physical and social environment also have excellent internal consistency when delivered across multiple environments (e.g., incivility [$\alpha = .93$] and social cohesion [$\alpha = .95$]). In addition, the momentary measures of psychological state have very good to excellent internal consistency (positive affectivity [$\alpha = .93$] and negative affectivity [$\alpha = .89$]). This is consistent with previous studies exploring the consistency of the PANAS when using a momentary approach (Steptoe et al., 2007). Collectively, scaling properties of each measure of victimisation worry represented in Jackson’s model have good reliability, based on data collected using mobile EMAs.
Table 2
Descriptive Statistics and Cronbach's Alpha Coefficients for Personal Crime Model (N = 499)\(^a\)

<table>
<thead>
<tr>
<th>Scale/Dimension</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry</td>
<td>1.00</td>
<td>4.00</td>
<td>1.76</td>
<td>0.59</td>
<td>.90</td>
</tr>
<tr>
<td>Likelihood</td>
<td>1.00</td>
<td>6.33</td>
<td>2.56</td>
<td>1.02</td>
<td>.89</td>
</tr>
<tr>
<td>Consequences</td>
<td>1.00</td>
<td>7.00</td>
<td>4.98</td>
<td>1.47</td>
<td>.80</td>
</tr>
<tr>
<td>Control</td>
<td>1.00</td>
<td>7.00</td>
<td>4.06</td>
<td>1.51</td>
<td>.90</td>
</tr>
<tr>
<td>Belief</td>
<td>1.00</td>
<td>4.00</td>
<td>1.70</td>
<td>0.60</td>
<td>.84</td>
</tr>
<tr>
<td>Incivility</td>
<td>1.00</td>
<td>3.78</td>
<td>1.99</td>
<td>0.66</td>
<td>.93</td>
</tr>
<tr>
<td>Social Cohesion</td>
<td>1.00</td>
<td>5.00</td>
<td>3.39</td>
<td>0.84</td>
<td>.95</td>
</tr>
<tr>
<td>Positive Affectivity</td>
<td>1.00</td>
<td>5.00</td>
<td>2.03</td>
<td>0.82</td>
<td>.93</td>
</tr>
<tr>
<td>Negative Affectivity</td>
<td>1.00</td>
<td>5.00</td>
<td>1.35</td>
<td>0.54</td>
<td>.89</td>
</tr>
</tbody>
</table>

\(^a\)N = 499 reflects the number of location based surveys completed by respondents

6.5.2 Momentary Model Assessment. An important starting point in assessing the proposed new momentary model of victimisation worry is to estimate fit indices to determine whether the model depicted in Figure 2 fits the momentary data collected. We assessed fit of our data to the momentary model shown in Figure 2 using a series of performance indicators: Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Normative Fit Index (NFI) and the Incremental Fit Index (IFI)\(^{12}\). Values that range between .90 and .95 indicate reasonable fit for a model, with values in excess of .95 indicating very good fit (Hu & Bentler, 1999). Based on these indexes and thresholds, our data fit the momentary model reasonably well (GFI = .96; CFI = .94; NFI = .92; IFI = .94), and further tests can be conducted to examine the hypothesised relationships between constructs.

6.5.3 Positive and Negative Affectivity and Perceptions of Place. Results presented in Table 3 show the effect positive and negative affectivity have on immediate perceptions of place (i.e., incivility and social cohesion). As feelings of positive affect increase, perceptions of incivility in the immediate location significantly decrease ($\beta = -0.10$, $p = .024$); conversely, as feelings of negative affect increase, perceptions of incivility in the immediate location also significantly increase ($\beta = 0.18$, $p < .001$).
Table 3  
**Regression Weights and Standardized Coefficients for Constructs Contained in the Momentary Perceptions of Personal Crime Model (N = 499)**

<table>
<thead>
<tr>
<th>Path: From/To</th>
<th>$b$</th>
<th>SE</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Affectivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivilities</td>
<td>-.09</td>
<td>.042</td>
<td>-.10</td>
<td>.024</td>
</tr>
<tr>
<td>Cohesion</td>
<td>.32</td>
<td>.034</td>
<td>.33</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Negative Affectivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incivilities</td>
<td>.17</td>
<td>.042</td>
<td>.18</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.14</td>
<td>.034</td>
<td>-.14</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Incivilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.43</td>
<td>.035</td>
<td>-.43</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Belief</td>
<td>.59</td>
<td>.034</td>
<td>.61</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Likelihood</td>
<td>.31</td>
<td>.045</td>
<td>.31</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Worry</td>
<td>.22</td>
<td>.038</td>
<td>.22</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.11</td>
<td>.044</td>
<td>-.11</td>
<td>.012</td>
</tr>
<tr>
<td><strong>Beliefs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.36</td>
<td>.047</td>
<td>.35</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Consequences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood</td>
<td>.15</td>
<td>.036</td>
<td>.15</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.18</td>
<td>.034</td>
<td>-.19</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Likelihood</td>
<td>.48</td>
<td>.039</td>
<td>.48</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Worry</td>
<td>-.07</td>
<td>.037</td>
<td>-.07</td>
<td>.049</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Likelihood</td>
<td>-.07</td>
<td>.037</td>
<td>-.07</td>
<td>.049</td>
</tr>
<tr>
<td>Worry</td>
<td>-.15</td>
<td>.032</td>
<td>-.15</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Model Fit Estimates: $\chi^2 = 93.05$, $df = 18$, $p < .001$; GFI = .96; CFI = .94; NFI = .92; IFI = .94

When considering perceptions of the social environment, associations between momentary positive and negative affect and perceptions of social cohesion were also observed in the hypothesised directions. As feelings of *positive affect* increase, perceptions of *social cohesion* within the immediate location also increase ($\beta = 0.32$, $p < .001$); likewise, as feelings of *negative affect* increase, perceptions of *social cohesion* within the immediate location decrease ($\beta = -0.14$, $p < .001$).

6.5.4 Perceptions of place, risk, and worry about crime in the proximate environment. All other hypothesised paths in the momentary model of victimisation worry are statistically significant and in implied directions (see Figure 2). For example, as
presented in Table 3, perceptions of incivility within the immediate environment are positively correlated with momentary worry about personal crime ($\beta = 0.22, p < .001$). The negative relationship between incivility and cohesion is also supported by the momentary model: as perceptions of incivility in the immediate environment increase, perceptions of social cohesion within the area decrease ($\beta = -0.43, p < .001$).

Turning to risk perception formation, we also observe significant associations between perceptions of likelihood of victimisation in the immediate location and momentary worry about crime—once again, supporting the hypothesised directions within the momentary model displayed in Figure 2. Specifically, as perceptions of victimisation risk (i.e., likelihood) in the immediate location increase, momentary worry about crime also increases ($\beta = 0.48, p < .001$). Cognitive appraisal of threat within the immediate environment also significantly influences momentary worry about crime, with both consequences of victimisation and control over victimisation mediating perceptions of victimisation threat within the immediate environment (consequences-likelihood [$\beta = 0.15, p < .001$]; control-likelihood [$\beta = -0.07, p = .049$]). All other significant associations between paths in the momentary model are presented in Table 3.

### 6.6 Discussion

The current study set out to determine whether a momentary model of victimisation worry could be used to understand the underlying processes behind fear of crime as it is experienced within the proximate environment. Our findings suggest that momentary models of victimisation worry can provide important information about the connections between risk perception, an individual’s psychological state, and their perceptions of the physical and social environment. We argue that advancements made to existing victimisation worry models represent a significant contribution within the fear of crime literature and in particular
our understanding of transitory experiences of fear and crime risk. Specifically, our findings advance three areas of the fear of crime scholarship, as discussed below.

6.6.1 Measuring fear of crime as a transitory experience in time and place.

First, our results suggest that momentary measures of fear of crime and risk perception are reliable and have good scaling properties. Specifically, we found that all measures contained in our momentary model have very good to excellent internal consistency/reliability. As discussed in our literature review, there have been very few assessments of fear of crime measures designed to capture context-dependent fear of crime (with the current research focus largely dependent on retrospective questions items for informing our understanding of fear of crime). Thus, the current study is one of the first to show that reliable information about context-dependent fear of crime and related constructs can be collected from individuals as they go about their day-to-day activities.

It is worth noting that in the current study we cannot compare path coefficients between retrospective and momentary models of victimisation worry given that these models aim to capture two very distinct types of fear of crime, which we will refer to as reflective and transitory (or context-dependent) fear. The former is not based on single events/experiences of crime, but rather the sampling of a number of fearful events/episodes experienced over a period of time from the respondent’s memory—whereas the latter type of fear assesses an immediate reaction to a threatening stimulus within the individual’s proximate environment. Nevertheless, our assessments of a new momentary model show that we can advance Jackson’s (2005) original measurement model to capture transitory fear of crime and risk when it occurs in the proximate environment, and support the hypothesised relationships between paths contained in this model.
6.6.2 **Advancing data collection methods.** Second, our results show that mobile technology may be a useful tool for collecting reliable information about fear of crime and risk as it is experienced in the proximate environment. Earlier, we discussed that existing methods used to test fear of crime often utilise paper pencil survey methods, which have limited our understanding of how fear of crime is embedded within experiences of threat, and alarm in the immediate environment. Our findings align with those presented above by Chataway et al. (2017) and Solymosi et al (2015) who have both found support for using mobile technology to measure fear of crime.

6.6.3 **Theoretical perspectives of transitory fear of crime.** Finally, our results show that a number of key dimensions of victimisation worry help to explain transitory reactions to crime and disorder. Specifically, two important theoretical advancements were made here to the fear of crime literature. First, our findings suggest that an individual’s psychological state at the time of completing an EMA on fear of crime significantly influences their perceptions of the immediate environment around them. For example, we note that negative affectivity is strongly associated with increasing perceptions of incivility within the immediate location. This shows the link between a person’s psychological disposition and their subjective perceptions of the social and physical environment, and aligns with previous research exploring such connections (see for example, Garbriel & Greve, 2003).

Second, our results support the theoretical connections between risk perception, perceptions of the physical and social environment and momentary worry about crime. Specifically, we find that an individual’s cognitive appraisal of a threatening event within their immediate environment (i.e., increasing severity of consequences and lack of control over victimisation) mediates their perceived victimisation risk which in-turn results in worry about crime within the immediate location. This finding is supported by numerous studies
discussed above, which have shown strong links between perceived victimisation risk, vulnerability perceptions and fear of crime (Jackson, 2009; LaGrange et al., 1992; McCrea et al., 2005).

Perceptions of incivility and social cohesion within the immediate location also mediate momentary perceptions of victimisation risk, as shown in the momentary model. This finding is once again supported by literature showing that a reasonable amount of variance in neighbourhood incivility perceptions can be accounted for by perceived victimisation risk (Wyant, 2008). That is, as perceived incivility within an area increases, so does perceptions of victimisation risk. We lay further support to this finding in our momentary model assessment, finding that both heightened levels of incivility in the immediate area and a perceived lack of social cohesion in the area produce higher levels of perceived victimisation risk, which in turn produces momentary worry about crime.

6.6.4 Study implications. The current study provides a significant contribution to the existing fear of crime scholarship by improving the measurement and methods used to capture fear of crime in time and place—and advancing our existing understanding of the underlying social-psychological processes involved in responses to immediate crime risk. This study provides researchers with future guidance for assessing context-dependent fear of crime. We argue that future work might wish to explore place perceptions further in relation to this momentary model. Chataway et al. (2017), for example, highlight that it would be interesting for researchers to examine how place attachment and familiarity impact fear of crime within a particular area. For example, are individuals who are symbolically attached to their immediate location more likely to notice situational cues of disorder that look “out of place” within their environment, and subsequently experience heightened levels of fear and perceived risk when this happens. This would also align with current research on the Signals Crime Perspective (see Innes, 2004 for a detailed review).
We also recommend that researchers aim to test momentary psychological states further, using more ambitious measurements of personality. For example, it is not known whether certain types of personality traits (i.e., having neurotic and/or conscientious traits) may influence momentary fear of crime, risk perception and assessments of neighbourhood incivility and social cohesion. By asking additional questions about the individual and their personality profile, researchers may be better able to tease out or isolate the impact of psychological, situational and social level variables on momentary worry about crime.

It would also be interesting to assess other individual-level variables and their influence on momentary worry about crime. Given that a substantial literature suggests variability in risk perception in respect to gender (Farraro, 1996; Schafer et al., 2006) and age (LaGrange & Ferraro, 1989), researchers may wish to test, for example, whether men and women differ in respect to their momentary levels of worry and risk perception. This is especially important given the incongruence found between actual victimisation risk and high levels of fear of crime among women.

Finally, although our current study focuses primarily on the quantitative assessment of fear of crime in the proximate environment, we argue that qualitative researchers should investigate the use of mobile technology to collect momentary qualitative information from individuals about their fear of crime. A growing body of qualitative work has made significant contributions to our understanding of fear of crime being grounded in the lived experiences of individuals (Sparks et al., 2001; Innes, 2004). Qualitative researchers have also argued that techniques such as ethnography have been useful for drawing out the situated nature of fear of crime (Pain, 2000). Therefore, mobile apps may allow qualitative-and-mixed methods researchers to trigger surveys with open ended questions about fear of crime. Additionally, applications like MetricWire, have built-in features allowing participants to take photos and record audio messages when triggered surveys. Researchers, for example,
could ask participants to capture real-time disorder through their mobile device’s camera—this would further disentangle the role of the physical environment in fear of crime and allow researchers to determine how incivilities may vary across movements in physical space.

6.6.5 Limitations. This study is not without its limitations, and these limitations should guide future research on fear of crime in time and place, as well as EMA research. First, due to sampling constraints (i.e., participant compliance during our mobile EMA) we were unable to perform preferred statistical assessments of the momentary model using multilevel modelling and other recommended approaches (such as Regression Tree Modelling; or Generalised Linear Models) (Richardson, et al., 2017). Based on our experience of data collection using EMAs, we suggest two lines of enquiry to address this research limitation. First, we recommend that future research evaluate the challenges associated with collecting reliable EMA data, given that many EMA research papers within the literature do not address or comment on how to overcome these challenges to data collection (Modecki & Mazza, 2017). Researchers need to generate possible statistical alternatives to dealing with these common challenges experienced when collecting EMA data (such as the tapering off, of EMA response rates over time). Second, we recommend that future research aim to draw out recruitment timeframes to as long as possible, and consider offering monetary incentives to all participants based on compliance with EMAs. This should improve overall sample size, and lead to better assessments of momentary data on fear of crime and related constructs.¹³

Finally, we acknowledge that characteristics of our sample in the current study indicate an over-representation of young women and that this may introduce measurement bias to our momentary model. We recommend that future research using social media advertisements as a recruitment strategy, carefully monitor clicks on survey advertisements and cease or “turn off” advertisements showing to female respondents in order to increase
participation and enrolment rates for male respondents. This strategy, may alleviate over-representation of women in convenient samples drawn from social media/web based recruitment.

### 6.6.6 Conclusion

Despite the above limitations, the current study has significantly advanced the existing measurement, methods, and theory used to capture fear of crime in time and place. We found that asking people about their fear of crime in the proximate environment provides a rich understanding of the various factors that may influence momentary fear states, such as risk perception, appraisal of threat, incivilities, social cohesion and psychological mood. We argue that this work makes a significant leap forward within the fear of crime literature, and that researchers should make better use of mobile technology and momentary models of fear of crime in order to better understand what fear of crime is actually a response to within the immediate environment. In doing so, more cost effective and predictive strategies for reducing fear and preventing crime and disorder within communities can be implemented based on empirically valid fear of crime data.

### ENDNOTES

1. Existing research suggests that targeted social media recruitment for survey research is an appropriate recruitment tool (Baltar & Brunet, 2012; Ramo, & Prochaska, 2012)

2. During the pre-experiment questionnaire, participants were provided with the option to enter a two-tiered prize draw as an incentive for their participation in the current study. The incentives offered were in line with current ethical standards defined by the National Statement on Ethical Conduct in Human Research (NSHR, 2015).

3. All eligibility requirements were outlined in the ethics information sheet that was provided to those considering participating prior to enrolling.

4. The typical participant was a 22-year old Australian born female, who at the time of the survey was not married, and lived in a rental property (see Table 1 for participant characteristics). The authors acknowledge that characteristics of the sample highlight an over-representation of female respondents, in comparison to males. Data were not weighted in the current study, because our focus was not on gender differences in momentary fear of crime. We do acknowledge that gender may impact momentary fear of crime, but the focus of this study was to assess the implied relationships between dimensions of the proposed momentary model of victimisation worry. Future research might wish to evaluate individual level differences in momentary fear of crime, at present no study within the literature has assessed this, mainly due to the constraints of sample size in these existing mobile app studies (including the current study).

5. Further response/completion rates were calculated for participants who remained enrolled in the study. Survey completion rates from when the participant enrolled to when they last refreshed the mobile app ranged from, 1% to 100% based on the number of possible survey triggers that could be received by the respondent. On average participants completed around 35% of all surveys within the time they enrolled and when they last refreshed the app. Further to this, the fear of crime survey item completion rate ranged from 99.6% to 100%.

6. Temporal triggering of the fear of crime EMA was based on recommendations identified in both Solymosi et al. (2015) and Chataway et al. (2017).

7. Jackson’s (2005) original social-psychological measures of victimisation worry included measures of fear of
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property victimisation. However, in the current study, we are interested in victimisations that occur when out in public space and chose to only measure fear of personal crime victimisation.

The assessment of different psychological “states” allow us to pool data from the same participant, it is argued that dependency in respect to the individual is not problematic because of the variation evidenced in time, place, and positive/negative affectivity.

The level of analysis for the current study is the place and time in which individuals were surveyed. The authors acknowledge the dependencies present in the current data (e.g., repeated observations for the same individuals in different times and places). However, the authors also wish to note that additional investigations of the momentary mood data collected from our participants indicate significant variability in negative and positive affectivity, so much so that all participants who had completed more than 1 survey in the current study had varying mood states at each point of surveying. We argue that this may show that individuals completing these fear of crime surveys were somewhat “different” in respect to their personality characteristics at the time and location of completing each survey, and therefore dependence in respect to the “individual” may not be as significant as first thought. Nevertheless, future work should attempt to validate this assertion by collecting more personality information from respondents and determining just how stable personality is when surveyed in different locations and times.

Due to the measurement of the variables of interest to the study, factor scores were created to enable model estimation with SEM. Factor scores were created using Maximum Likelihood Estimation (MLE) and the regression method in IBM SPSS 22.0.

In addition to Endnote 9, the authors wish to provide further justification for the statistical technique. We acknowledge that SEM procedures may not be the most preferred statistical procedure for dealing with EMA data. Many researchers recommend using Multilevel Modelling and Regression Tree Modelling to deal with the complex data collected from EMAs, but these analyses are only possible when EMA data meets the conditions of these statistical tests (Modecki & Mazza, 2017). Many EMA journal articles do not discuss the challenges of collecting useful, reliable, and valid EMA data from populations of interest (Modecki & Mazza, 2017). These challenges were experienced in the current study in respect to: enrolment, compliance, and engagement in the EMA, and all affect our ability to use recommended statistical techniques for EMA data. We argue that more research is needed to investigate whether alternative data techniques such as Bayesian models (that are less sensitive to issues of sample size) (see for example, McNeish, 2016) can be used to examine EMA data, when the data collected do not meet the requirements of preferred statistical tests.

Because Kenny, Kaniska, and McCoach (2011) caution that indices such as the RMSEA may be problematic and misleading when estimated models have small degrees of freedom, such as the current models do, fit statistics exclude RMSEA, and instead rely on alternative indices of absolute and approximate fit (e.g., GFI, NFI, and IFI).

We acknowledge that monetary incentives based on compliance during an EMA would need to meet ethical requirements and relevant risk assessments be undertaken assessing the coercive nature of such incentives.
6.7 References


MetricWire, Inc. (2017). MetricWire (Version 3.5.1) [Mobile application software].


Chapter 6 presented the results of Study 3 utilising the MetricWire mobile application. This study was designed to answer the final research question of this dissertation: *Can momentary models of fear of crime be developed to consider interactions between time, place, and psychological states? And if so, how can these new theoretical models inform our existing knowledge of the social-psychological processes of fearing crime.?*

Results of Chapter 6 suggest that the new theoretical model tested can inform our understanding of how momentary psychological state, perceptions of the immediate social and physical environment, and risk perception in the immediate environment affect momentary worry about crime. All relationships hypothesised in the new momentary model of victimisation worry were significant and in the expected directions. Results presented in Chapter 6 demonstrate how researchers can begin to expand our existing theoretical knowledge on fear of crime to consider how features of the physical and social environment shape momentary crime risk. The final chapter of this dissertation (Chapter 7) presents a synthesis of all the previous chapters and the key findings of each study conducted in the current dissertation.
CHAPTER 7: DISCUSSION AND CONCLUSIONS

7.1 Overall Assessment of Research Significance and Innovation

The present body of work has advanced our existing empirical knowledge on fear of crime by using alternative measures, innovative technologies, and contemporary theoretical models to examine fear of crime and risk perception. Three studies were designed to collect data about fear of crime: The 2014 Gold Coast Community Survey (GCCS) (i.e., Study 1), the iExperience pilot study (i.e., Study 2), and the MetricWire mobile application study (i.e., Study 3). From these studies, five manuscripts were produced. Collectively, these studies and manuscripts answer the overarching research question of this dissertation: How can we better understand fear of crime and perceived victimisation experiences in time and place using alternative measures of crime fear, innovative technologies, and momentary models of victimisation worry? Underneath this overarching question were four focused research questions. Responses to these questions are described below in more detail.

Results reported in the first three manuscripts showed that alternative retrospective social-psychological measures of victimisation worry are reliable and valid when administered in the Australian context, and that the process model derived from these measures can be used to explain connections between various predictors of fear of crime among Australian residents. Subsequently, findings from the first three manuscripts answer Research Questions 1 and 2 of the current dissertation. The remaining manuscripts in this dissertation show how researchers can further advance the validated social-psychological measures and model of victimisation worry in two ways: (a) by collecting context-dependent information on fear of crime using mobile technology; and (b) by developing and testing momentary models of victimisation worry. By advancing existing measures, methods, and models, Research Questions 3 and 4 of the current dissertation were answered. Below is a detailed summary of the contribution of each study and manuscript to addressing (a)
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shortcomings of the fear of crime literature; and (b) answering each focused research question of the current dissertation.


As discussed in Chapters 1 and 2, a number of quantitative question items have been developed to measure fear of crime. In particular, researchers have relied upon perceptions of safety questions to gauge fear of crime for several years. Yet, these traditional measures of fear of crime have been criticised because of their narrow operationalisation of crime fear (Hale, 1996; Farrall & Gadd, 2004). These criticisms of traditional fear of crime measures have resulted in the development of new questions items used to gauge the intensity of emotional reactions to crime risk (Farrall & Gadd, 2004), and the frequency of emotional episodes of fear (Hough, 2004; Jackson, 2004). Despite the development of new measures for testing fear of crime, researchers have continued to call for more validation studies assessing the reliability and validity of fear of crime measures (Farall et al., 1997; Jackson, 2005, 2009). In addition to these calls, researchers have recommended that fear of crime be treated as a multidimensional construct, and that future measures account for the complex interplay between affective, behavioural, and cognitive components of fear of crime (Farrall et al., 1997; Gabriel & Greve, 2003; Jackson, 2004).

To address these shortcomings with the measurement of fear of crime, a study was conducted to determine whether contemporary measures of crime fear, which have been used in European countries, are valid and reliable indicators of fear of crime when tested in an Australian context. Moreover, Study 1 assessed whether an established process model of victimisation worry (consisting of these measures) could be used to understand Australians reactions to crime and disorder (Jackson, 2005). In order to advance the model and measures of victimisation worry further it was important to first determine whether this model
appropriately fitted data collected from Australian samples. The cross-cultural validity of these alternative measures of fear of crime were assessed using survey data collected from residents living in Southeast Queensland, Australia. Results of the Gold Coast Community Survey were reported in three manuscripts, designed to answer the first two research questions of the current dissertation.

The first research question answered by this study was: *Are established measures of fear of crime and risk perception reliable and valid when administered in Australia?* Results presented in Chapter 2 of the current dissertation support the cross-cultural validity of the contemporary measures of fear of crime and the model derived from these measures using data collected from an Australian sample. Specifically, all measures used to gauge fear of crime had acceptable scaling properties, aligning with previous studies assessing the reliability of these contemporary measures in the European context (Jackson, 2005, 2006, 2009, 2013). Furthermore, most of the relationships between measures contained in the established process model of victimisation worry were found to be in the hypothesised directions. Exceptions to this finding were the non-significant associations identified between consequences-worry, control-worry and cohesion-control relationships for fear of personal and property victimisation (see Chapter 2, Section 2.5.3).

Provided with the knowledge that these measures were valid and reliable, the next step of this dissertation was to examine what new knowledge could be produced from the validated victimisation worry model. The next two Chapters (Chapters 3 and 4) were designed to answer the second research question of this dissertation: *What new knowledge can be produced in relation to particular questions about fear of crime when applying an established model of victimisation worry?* Specifically, the manuscripts provided new insight into two issues relating to fear of crime (i.e., the effect of community crime prevention awareness on crime fear and the effect of gender on crime fear). The manuscript presented in
Chapter 3 identified that some dimensions contained in the model of victimisation worry were moderated by an individual’s awareness of community crime prevention underway in their neighbourhood (i.e., incivility-cohesion, consequences-likelihood and likelihood-worry paths were all significantly weakened when an individual was aware of community crime prevention in their neighbourhood). Based on these findings, recommendations were made to improve the effectiveness of crime prevention awareness campaigns on reducing fear of crime and risk perception (see Chapter 3, Section 3.6).

The manuscript presented in Chapter 4 showed how dimensions contained in the victimisation worry model could be used to provide new insight into old debates in the fear of crime literature (i.e., the gender-victimisation paradox). For example, gender was found to moderate some dimensions of the victimisation worry model. More precisely, results suggested that perceptions of incivility within the neighbourhood affect perceptions of the likelihood of personal victimisation differently for men, compared to women. In other words, the relationship between perceptions of incivility and likelihood of victimisation experience was stronger for men than it was for women. Despite some variation in the dimensions contained in the model of victimisation worry (i.e., incivility-likelihood), most relationships between paths contained in the model did not differ when separating models by gender. This suggested that men and women perceive crime and disorder in a similar manner (see Chapter 4, Section 4.6).

Collectively, results of Study 1 and the three manuscripts produced from it indicate that contemporary measures of fear of crime are reliable when tested in an Australian context, and that the model of victimisation worry derived from these measures can be used to understand reactions to crime and disorder. Moreover, the model can produce new knowledge about fear of crime (i.e., the effect of crime prevention awareness on crime fear and gender differences in crime fear). Given that the measurement of fear of crime could be
improved by considering the interplay between the affective, cognitive, and environmental components of fear, and that established process models of victimisation worry could be validated within new contexts, the next step of this dissertation was to investigate how the existing model could be further advanced. The first step to advancing the model of victimisation worry, was to investigate whether emerging techniques for collecting more ecologically valid fear of crime data could be combined with the measures of victimisation worry tested in Study 1 to provide a clearer picture of the context-dependent nature of fear of crime and risk perception. Specifically, Study 2 aimed to assess whether these emerging methods (i.e., mobile technology) could be used to collect viable context-dependent data on fear of crime.

7.3 iExperience Pilot: Introducing a New Method for Collecting Fear of Crime Data

Just like crime, researchers have identified spatio-temporal patterns in fear of crime and risk perception (Fisher & Nasar, 1995; Solymosi et al., 2015; Wyant, 2008). However, our ability to capture the spatio-temporal features of fear of crime has been restricted by the existing methods used to examine crime fear. For example, as described in Chapter 5, Section 5.3, fear of crime data is typically collected from paper-pencil surveys that ask respondents to reflect back on events that have occurred in one particular location. This has limited researchers’ ability to examine whether emotional reactions to crime and risk vary within time and space. Contemporary research has begun to explore whether mobile technologies can be used to address this problem by capturing context-dependent attitudes towards crime (Solymosi et al., 2015). However, these assessments have been limited in respect to their measurement and operationalisation of fear of crime constructs.

Moreover, prior to conducting the current research, it was unknown whether more complex measures of fear of crime that were validated in Australia using the GCCS in Chapter 2 could be administered on mobile devices and yield reliable data about fear of
crime. Therefore, Study 2 aimed to expand on the existing validation work presented in Chapter 2 by exploring whether novel data collection methods, namely mobile technology, could provide further insight into fear of crime and risk that is experienced in the proximate environment.

Study 2 piloted a smartphone application called iExperience (IE). The IE application collected information from respondents about their fear of crime and levels of risk perception, using victimisation worry measures (those that were validated in Study 1). Specifically, the pilot study was designed to answer research question three of the current dissertation: *Can mobile technology be leveraged to collect meaningful context-dependent data on the various dimensions of fear of crime and risk perception contained in established social psychological process models of victimisation worry?* Results of Study 2 were presented in the form of a published manuscript in Chapter 5 and suggest that mobile technology can be used to collect meaningful information about fear of crime. For example, it was found that Jackson’s measures of victimisation worry had strong reliability/internal consistency when administered using mobile technology. The findings presented in Chapter 5 suggest that more ecologically valid data about fear of crime as it is experienced across different places can be produced from a mobile EMA approach to data collection.

Furthermore, most of the hypothesised relationships between constructs contained in established process models of victimisation worry were supported in the IE pilot study. This is with exception to the relationship between perceived incivilities and worry about crime, which was found to be in the opposite direction, suggesting that when perceptions of incivility increased, worry about crime decreased (see Chapter 5, Section 5.6). This finding is inconsistent with the fear of crime literature, which has identified a strong positive relationship between incivility and fear of crime (Brunton-Smith & Sturgis, 2011; Farrall et al. 2007; Hale, 1996). It is argued that because of the sample size in the IE pilot study, that
Further confirmatory tests would need to be undertaken to examine why increasing incivility perceptions may reduce fear of crime. One possible explanation for this finding is that individuals in the study may have become desensitised to incivility within the pinged locations as result of repeated measurement, and subsequently the effect of incivility perceptions on worry perceptions within new locations was reduced.

Study 2 showed how mobile technology could be leveraged to collect meaningful information about fear of crime and risk perception. Because this method of collecting more ecologically valid data about fear of crime was deemed viable, the final step of this dissertation was to examine how established models of victimisation worry could be extended to a momentary model using mobile technology. The final study of this dissertation introduced and tested a new momentary model of victimisation worry, that extended upon the first-generation models of fear of crime tested in Europe (Jackson, 2005, 2009, 2013) and Australia (Chataway & Hart., 2016, 2017, 2018). Specifically, the new *momentary* model of victimisation worry is a more process-oriented model that considers interactions between time, place, psychological state, risk perception and momentary worry about crime. The new model was outlined in Chapter 6 of this dissertation, and was validated using data collected from a sample of young adults, using a mobile application called MetricWire.

7.4 **MetricWire Study: Developing a New Momentary Model of Fear of Crime**

Although mobile technology has been used to collect context-dependent fear of crime data, theoretical models recognising the momentary nature of attitudes towards crime have remained untested, until now. In Study 3 of this dissertation, the model of victimisation worry tested in Chapters 2 through 5 provided the foundations from which a momentary model of fear of crime was developed. Prior to Study 3, the models tested in Study 1 and 2 utilised retrospective frequency questions to measure worry about crime, with no known research expanding the measurement model further to include indicators that consider a
person’s proximate environment (i.e., questions that specifically ask about individual’s levels of worry within their current location). In addition, the traditional victimisation worry model (Jackson, 2005) did not contain variables measuring dispositional states of an individual and their interaction with perceptions of place (i.e., incivility and social cohesion). Adding measures of momentary psychological state to a momentary victimisation worry model provides further insight into how an individual’s general emotional state influences their immediate perceptions of place and subsequent fear of crime and perceptions of crime risk.

Therefore, to address these theoretical shortcomings of the current fear of crime literature in relation to momentary models of crime fear, Study 3 introduced and developed a momentary model of victimisation worry tested using mobile data collected from a smartphone application called MetricWire. Results of MetricWire study were presented in Chapter 6 of the current dissertation. Results suggest that momentary models can allow researchers to address shortcomings of methods and measures used to examine context-dependent fear of crime and provide a unique picture of how hypothesised relationships within original social-psychological process models explain individuals’ momentary attitudes towards crime.

Specifically, results presented in Chapter 6, Section 6.5.2 indicate that momentary measures of victimisation worry are reliable and that all hypothesised connections between momentary measures of victimisation worry are significant and in the implied directions. Two notable advancements to theory were identified in Chapter 6. First, an individual’s psychological state at the time of completing an ecological momentary assessment on fear of crime significantly influenced their perceptions of the immediate environment around them. For example, positive affectivity was strongly associated with decreasing perceptions of incivility within the immediate location of the respondent. The opposite pattern was observed when considering the effect of negative affectivity on incivility perceptions in the
immediate environment. These results show the link between a person’s psychological disposition and their subjective perceptions of the social and physical environment. Moreover, these findings build upon previous research exploring connections between psychological state and fear of crime using retrospective measures of worry to measure fear of crime (Garbriel & Greve, 2003; Stafford, 2009). The findings in Chapter 6, Section 6.5.3 support the view that a person’s emotional state affects their assessment of physical and social cues within the proximate environment and this in turn shapes their perceptions of immediate crime risk and concern about victimisation.

Second, results of Study 3 that are presented in Chapter 6, Section 6.5.4 support the theoretical connections between risk perception, perceptions of the physical and social environment, and momentary worry about crime. Specifically, it was found that an individual’s cognitive appraisal of a threatening event within their immediate environment (i.e., increasing severity of consequences and lack of control over victimisation) mediated their perceived victimisation risk, which in-turn resulted in worry about crime within the immediate location. This finding is supported by numerous studies, which have shown strong links between perceived victimisation risk, vulnerability perceptions, and fear of crime (Jackson, 2009; LaGrange et al., 1992; McCrea et al., 2005).

Perceptions of incivility and social cohesion within an individual’s immediate location were also found to mediate momentary perceptions of victimisation risk. This finding is once again supported by the existing literature that has identified that a reasonable amount of variance in neighbourhood incivility perceptions can be accounted for by perceived victimisation risk (Wyant, 2008). That is, as perceived incivility within an area increases so do perceptions of victimisation risk. Results presented in Chapter 6 lay further support to this finding. Specifically, they suggest that both heightened levels of incivility and a perceived lack of social cohesion in an area produce higher levels of perceived
victimisation risk, which in turn produces momentary worry about crime. Study 3 has significantly advanced upon traditional process models of victimisation worry, and has shown that when considering place, time and psychological state in these new models, novel insights about fear of crime as it is experienced within the proximate environment can be produced.

7.5 Synthesis of Limitations and Future Directions

The current research, although advancing our empirical and theoretical knowledge on fear of crime, is not without its limitations. Moreover, given the complexity of fear of crime as a topic, there are a number of ways that future work can build upon the current dissertation. The limitations presented below represent a mixture of measurement, methodological, and theoretical limitations of the current body of work, more specific limitations of each study and manuscript are provided in Chapters 2 through 6.

7.5.1 Measurement and methodological limitations and future directions.

Participant recruitment for the iExperience and MetricWire studies (i.e., Studies 2 and 3) presented the most significant challenge to conducting the current research. Although existing studies utilising mobile technology to examine social behaviour yield similar samples to the current research, it is acknowledged that an increased sample size may have allowed for more significant spatial and temporal analyses to be undertaken with the fear of crime data collected from these apps. Unfortunately, methods for addressing compliance and engagement issues in mobile app research remains understudied within the social sciences (Modecki & Mazza, 2017). Scholars have recommended that more research be undertaken to determine how to improve participant compliance and engagement in mobile app studies and how to deal with data issues relating to lack of engagement in EMAs (Modecki & Mazza, 2017). Some improvements in sample size and compliance have been noted when respondents are incentivised based on their level of participation/involvement in a study,
rather than using single prize draw incentives (Moore, et al., 2014). However, more work is required to determine what alternative statistical strategies can be used to deal with EMA data that contain complex time and place dependencies.

Moreover, although mobile apps may be a useful method for collecting momentary data about fear of crime, scholars have recently questioned whether such methods sensitise individuals to fear of crime and make crime appear to be more proximal within their environment (Lee & Ellis, 2017; Jackson & Gouseti, 2016). It is important to note that existing work using mobile devices to measure fear of crime—including the research presented in the current dissertation—has found that most individuals are not fearful of crime in their immediate location, and this does not appear to significantly change with repeated measurement (Solymosi et al., 2015). This point is further lamented in additional textual data that was collected during Study 3 of the current dissertation; for example, one participant when asked by the mobile app, “In your own words, why are you not at all worried about becoming the victim of an attack in this current location”, simply responded with “Why would I be?” This suggests that despite the repeated measurement of fear of crime in mobile studies, respondents are nevertheless capable of forming their own opinions on crime and disorder in their immediate environment and may not become sensitised to fear as a result of repeated measurement. Nevertheless, the issue of sensitisation is an important one to consider in future fear of crime research using mobile technology. Researchers may wish to collect additional data about the individual (i.e., their levels of perceived self-control) to determine how susceptible they may be to repeated survey measurement and fear sensitisation.
In addition to the above limitations, the current dissertation focuses on the measurement of only two crime types: fear of personal and property victimisation. In future studies, it may be worthwhile examining fear of other types of crime along with the measures contained in the new momentary model of victimisation worry proposed in Chapter 6. For example, momentary questions about fear of terrorism, cyber victimisation, and/or sexual victimisation/harassment could be included in future momentary models. This would allow researchers to assess whether the momentary worry dimensions shift depending on an individual’s response to a specific type of crime. Moreover, the current dissertation measures the affective components of fear of crime (frequency of worry) and cognitive components of threat appraisal (i.e., likelihood of victimisation, consequences of victimisation, and control over crime). Unfortunately, the current research does not include behavioural measures of fear of crime (i.e., presence of avoidant behaviour). Therefore, future research may wish to consider incorporating behavioural indicators of fear of crime into the new momentary models validated in Chapter 6. For example, researchers may ask a respondent how likely they are to return back to the current location. This would allow researchers to assess the interplay between affective, behavioural and cognitive features of crime fear.

Finally, the current research is limited to a quantitative evaluation of fear of crime. Although the research presented in this dissertation clearly demonstrates how useful information about the social-psychological processes involved in fear of crime can be gathered from a quantitative approach, it is argued that future work considers triangulating quantitative and qualitative data/methods. In doing so, researchers may be able to paint a clearer picture of the micro and macro features that constitute worry about crime and risk perception (Lee & Ellis, 2017). For example, a mixed methods study on fear of crime may use mobile assisted data collection to collect qualitative data on fear (i.e., asking people to

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26 Fear of property victimisation was assessed in Chapters 2 through 4, all remaining chapters and manuscripts assessed fear of personal victimisation in public locations.
describe in their own words why they are worried or not at all worried about a particular type of crime in their proximate environment based on their responses to quantitative question items). Avenues for qualitative research using mobile technology are discussed in further detail in Chapter 6, Section 6.6.4.

7.5.2 **Theoretical limitations and future directions.** Although the current research has shown clear evidence in support of a new momentary model of victimisation worry, it is worth noting that there are new theoretical perspectives emerging within the fear of crime literature that may compliment the current research. Specifically, scholars are beginning to explore how perceptions of crime risk may be grounded in psychological distance and mental construal\(^{27}\) (Jackson & Gouseti, 2015; Gouseti, 2017) (see also, Chapters 4 and 5). For example, Jackson and Gouseti (2015) apply psychological distancing to fear of stranger violence. They assert that when people experience the event of stranger violence as psychologically distant, they are more likely to represent this event as occurring in remote localities, far from now, and to people who are regarded as different to them. The construal level theory of psychological distance and its application to crime fear aims to understand how representations of crime transcend the ‘here and now’. Because mobile applications allow researchers to assess representations of crime events within the ‘here and now’, they may allow researchers to test distancing in a novel manner. For example, the effect of spatial distance on fear of personal victimisation could be measured in future studies by comparing participants fear of crime whilst in familiar locations (i.e., at home) versus when participants are in unfamiliar locations. Additional open-ended questions posed to participants about their self-reported levels of fear within familiar versus unfamiliar locations could then be used to

\(^{27}\) Mental construal is how individuals perceive, interpret and comprehend the world around them (Trope, Liberman, & Wakslak, 2007). An object or event can be represented at different levels of construal. For example, low-level construals are concrete and unstructured representations of an event (i.e., specific worry and concern about becoming the victim of violence). While, high-level construals are abstract and schematic representations of an event (i.e., diffuse concerns about the causes and significance of violence in society).
examine how they may represent crime and disorder at different levels of mental construal (see Footnote 27 for construal definition).

In addition to theoretical perspectives of psychological distance and their applicability to fear of crime, researchers are also beginning to explore the physiological processes involved in fearing crime (Castro-Toledo, Perea-Garcia, Bautista-Ortuño, & Mitkidis, 2017; Kim & Kang, 2018; Noon, Beaudry & Knowles, 2017). Because mobile devices now have capabilities to record physiological processes such as heart beat, future fear of crime research may wish to test real time physiological responses to crime and disorder by asking respondents to record their heat rate along with asking momentary questions about their fear of crime. This may allow researchers to assess the hypothesised links between threat perception (a cognitive process) and fear (the resulting behavioural/physiological reaction).

Finally, the current research is driven by the idea that fear of crime is a serious social problem that has consequential impacts for both the individual and society: and therefore, research is required to uncover what fear of crime is a response to within the environment in order to develop effective strategies for reducing its prevalence. However, scholars continue to debate whether crime fear serves a functional purpose and if it really is a “bad thing” to be fearful of crime (Jackson & Gray, 2009). The continued research focus on fear of crime as a series of negative emotions, may be attributed to wider epistemological foundations in criminology. Criminology (for the most part) continues as a discipline to focus on the “negative” and what leads individuals and groups to what is defined as deviant and criminal behaviour. Positive criminology has emerged as a new conceptual framework in criminology that focuses on individuals’ encounters with forces and influences that are positive, which distance them from deviance and crime (Ronel & Elisha, 2011).

Although positive criminology has been applied to research on desistance and rehabilitation, its application to the study of fear of crime and communities has been limited.
Therefore, future research may wish to consider approaching fear of crime from a positive criminology lens—one that seeks to understand non-fear, and what people enjoy about being in particular places, rather than asking questions about their levels of worry and perceived community dysfunction in these places. Taking a positive approach to the study of fear of crime may allow us to explain what factors may be leading individuals away from fearing criminal victimisations, and assist researchers with understanding why some people are far more susceptible to fearing crime than others when in particular places. This approach may also reduce researchers sensitising their participants to fear, because of negative question framing (see Section 7.5.1).

7.6 Policy Implications

A number of policy recommendations may be drawn from the current research. Specifically, these recommendations centre around reducing fear of crime; and particularly, the strong positive link found between perceived victimisation experience and worry/concern about crime.28 In all three studies presented in this dissertation, perceptions of the likelihood of victimisation significantly predicted frequency of worry about crime, regardless of survey delivery method. Moreover, as past research has identified, individuals’ perceptions of victimisation risk are often incongruent with their actual risk posed by crime (Lee & Myhen, 2017). To reduce this effect, psychoeducational materials could be developed and administered using mobile technology. Evaluations of the effectiveness of psychoeducational resources to reduce vulnerability perceptions are limited within the criminology literature, but the use and effectiveness of psychoeducation to reduce symptoms of generalised anxiety and depression is well established (Donker, Griffiths, Cuijpers, & Christensen, 2009; Rummel-Kluge, Walz & Kissling, 2009). For example, Donker et al. (2009) in their meta-analysis of psychoeducational materials showed that although commonly believed to be ineffective, brief

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28 It is important to note that interventions should only target individuals who report being worried about crime in their immediate location for reasons outlined in Section 7.5.
passive psychoeducational interventions for depression and distress can reduce overall symptoms, and be used as a first-stage intervention. Moreover, the effectiveness of these materials is enhanced when using clear evidence-based medical/psychological and depression/anxiety information compared to feedback on test-results and general advice.

In reference to using psychoeducational materials to reduce fear of crime, researchers could develop dynamic mobile triggers that are fired when a respondent indicates that they are worried about becoming the victim of a crime in their immediate location. Once these dynamic triggers are fired to the respondent’s smartphone, psychoeducational materials can be presented on how to reduce anxiety symptoms (i.e., breathing techniques), how to defend oneself from an attack, and/or challenge preconceived notions about the rates of victimisation within a particular place\textsuperscript{29}. These psychoeducational materials could be combined with real place information alerting the respondent to safe-house locations, shopping centres, local police stations, and accident and emergency centres in their immediate vicinity. Moreover, because the current research focuses on fear of public victimisation experiences, there may be an opportunity to broaden such materials to target perceived fear about private victimisations (i.e., fear of domestic violence)\textsuperscript{30}. For example, fearful female respondents could be provided with information on how to recognise domestic violence and coercive control in a relationship, domestic violence hotlines, and sexual health clinics within their immediate area. The use of dynamic triggers and delivery of psychoeducation to reduce fear of crime

\textsuperscript{29} Caution must be given to this last strategy, as providing information about actual crime rates within the immediate area to a respondent may increase their fear of crime, particularly if crime rates are higher than what they perceive them to be.

\textsuperscript{30} It is recommended fear of crime data collected from mobile apps inform interventions at the individual-level, and this data not be made publicly available or accessible to third parties. Some safety apps have been developed to report safety information publicly via websites. Although this information informs the general public about where people feel safe versus unsafe in their community, there are potential issues that may arise when publicly communicating safety data collected from mobile apps. For example, predatory offenders may be able to gain access to vulnerable victims using safety data that has been made publicly available. Moreover, making such information public knowledge may stigmatize individuals and groups who live or frequent areas that are perceived as unsafe by other members of the community, as was the case with controversial US app “SketchFactor” (see Marantz, 2015). Therefore, further research is required to better understand how data collected from these types of apps should be disseminated.
may also increase compliance and engagement with mobile based EMAs, because users will be able to interact with the mobile application and directly benefit from its use.

Finally, the current research has identified that public officials tasked with evaluating the community’s fear of crime need to broaden surveys to include measures of the frequency of worry about particular types of crime, risk perception, and perceptions of the physical and social environment. Relying upon single item questions to measure fear of crime may result in officials over-estimating the true level of crime fear experienced within neighbourhoods, and neglecting important correlates of attitudes towards crime and victimisation risk. By accurately identifying where fear and risk perception clusters in space and time, more targeted and cost-effective fear reduction initiatives can be developed.

7.7 Overall Conclusions

The current dissertation aimed to improve the existing measurement, methods, and theories used to examine fear of crime. First, evidence presented in this dissertation suggests that contemporary measures of fear of crime are reliable and valid when collected from Australian residents. Moreover, established models of victimisation worry can be used to understand individuals’ reactions to crime and disorder. This dissertation demonstrates the importance of measuring fear of crime as a multidimensional construct, consisting of the interplay between affective and cognitive components of fear, and environmental perceptions. Specifically, results presented in Chapters 2, 3, and 4 demonstrate the importance of considering subjective perceptions of victimisation risk/appraisal of threat, and perceptions of the physical and social environment in shaping worries and concerns about crime and victimisation experience (Chataway & Hart, 2016, 2017, 2018).

Second, this dissertation presented evidence showing that researchers can expand on the traditional methods used to collect fear of crime data, by using mobile technology (Chataway, Hart, Coomber, & Bond, 2017). Moreover, using mobile technology to collect
information about fear of crime provides researchers with the opportunity to examine the
context-dependent nature of experiences of crime fear and improve the ecological validity of
fear of crime measures traditionally examined using paper-pencil instruments. Specifically,
results presented in Chapter 5 show that reliable data can be collected from individuals about
their experiences of fear of crime and risk using mobile technology, thus improving the
ecological validity of contemporary fear of crime measures (Chataway et al., 2017).

Finally, the current dissertation demonstrates how researchers can expand upon
existing process models of victimisation worry by extending them to the momentary
environment. The new momentary victimisation worry model proposed in this dissertation
considers the interplay between affective, cognitive, and environmental perceptions in
driving momentary worry about crime (Chataway, Hart, Coomber, & Bond, 2018). Evidence
presented in this dissertation (Chapter 6) supports the new momentary model; suggesting that
momentary worry about crime is affected by perceptions of immediate victimisation risk
within the environment, cognitive appraisal of a threatening event, perceptions of the
physical and social environment, and an individual’s psychological state. The new model
extends upon traditional models of victimisation worry and contributes to our empirical
knowledge on fear of crime by considering the interactions between place, time, and
psychological state.

To conclude, fear of crime is a complex multi-faceted phenomenon that has engaged
scholars’ interest for decades. A number of theoretical perspectives, measurement tools, and
methods have informed our current empirical understanding of fear of crime. This
dissertation has shown how researchers can begin to consolidate these theoretical
perspectives and how advancements in technology can be leveraged to better measure fear of
crime events in time and place. It is hoped that the current dissertation guides future research
that examines and tests fear of crime and related constructs as they are experienced in the
momentary environment. Furthermore, this dissertation demonstrates that to truly understand what fear of crime is a response to within the environment, we must go beyond simplistic descriptive level analyses and instead dig beneath the surface to understand and explain why people behave the way they do in response to crime. Moreover, to understand responses to crime and disorder we must hypothesise the structures and mechanisms that shape these immediate behavioural and emotional reactions to crime and risk. In doing so, we can advance our understanding of the phenomenon that is “fear of crime”.
8.0: REFERENCES


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31 This reference list only contains references included in Chapter 1 and Chapter 7 of the current dissertation. References contained in each manuscript are presented in Chapters 2 through 6 in accordance with copyright requirements of a dissertation by series of publications. This choice of formatting also aligns with the dissertation formatting recommendations made by the Griffith Graduate Research School (https://www.griffith.edu.au/higher-degrees-research/current-research-students/thesis/preparation/formatting).


# 9.0: APPENDICES

## Appendix A: The 2014 Gold Coast Community Survey Instrument

### 2014 Gold Coast Community Survey

**Ethical Clearance:** CCJ/40/13/HREC/222

**School of Criminology and Criminal Justice**

**Griffith University**

**Southport, QLD 4222**

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**SECTION A. CRIME AND DISORDER**

We would like to begin by asking you some questions about crime and disorder.

**During the past month, how often have you worried about the following... (Tick the box that best applies to you)**

1. **Being attacked by a stranger in the street**
   - [ ] Never in the past month
   - [ ] 1-2 times in the past month
   - [ ] Every day in the past week

2. **Being robbed or mugged in the street**
   - [ ] Never in the past month
   - [ ] 1-2 times in the past month
   - [ ] Every day in the past week

3. **Being harassed, threatened or verbally abused in the street**
   - [ ] Never in the past month
   - [ ] 1-2 times in the past month
   - [ ] Every day in the past week

4. **Having someone break into your home whilst you are there**
   - [ ] Never in the past month
   - [ ] 1-2 times in the past month
   - [ ] Every day in the past week

5. **Having someone break into your home whilst you are away**
   - [ ] Never in the past month
   - [ ] 1-2 times in the past month
   - [ ] Every day in the past week

**In the next 12 months, how likely do you think it is that you will fall victim to the following... (Tick the box that best applies to you)**

1. **Being attacked by a stranger in the street**
   - [ ] Definitely not going to happen
   - [ ] Definitely going to happen

2. **Being robbed or mugged in the street**
   - [ ] Definitely not going to happen
   - [ ] Definitely going to happen

3. **Being harassed, threatened or verbally abused in the street**
   - [ ] Definitely not going to happen
   - [ ] Definitely going to happen

**To what extent would your life be affected if you experienced the following... (Tick the box that best applies to you)**

1. **Being attacked by a stranger in the street**
   - [ ] Not at all
   - [ ] A very great extent

2. **Being robbed or mugged in the street**
   - [ ] Not at all
   - [ ] A very great extent

3. **Being harassed, threatened or verbally abused in the street**
   - [ ] Not at all
   - [ ] A very great extent

4. **Having someone break into your home whilst you are there**
   - [ ] Not at all
   - [ ] A very great extent

5. **Having someone break into your home whilst you are away**
   - [ ] Not at all
   - [ ] A very great extent

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**During the next month, how often do you think the following will occur in your neighbourhood (i.e., within a 15 minute walk of your home)... (Tick the box that best applies to you)**

1. **Someone being attacked by a stranger in the street**
   - [ ] Every day in the next month
   - [ ] 1-2 times in the next month
   - [ ] Never in the next month

2. **Someone being robbed or mugged in the street**
   - [ ] Every day in the next month
   - [ ] 1-2 times in the next month
   - [ ] Never in the next month

3. **Someone being harassed, threatened or verbally abused in the street**
   - [ ] Every day in the next month
   - [ ] 1-2 times in the next month
   - [ ] Never in the next month

4. **Someone breaking into a home whilst the homeowner is there**
   - [ ] Every day in the next month
   - [ ] 1-2 times in the next month
   - [ ] Never in the next month

5. **Someone breaking into a home whilst the homeowner is away**
   - [ ] Every day in the next month
   - [ ] 1-2 times in the next month
   - [ ] Never in the next month

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**CONTINUE**
**SECTION B. SOCIAL COHESION**

Next, we would like to ask you about the environment in which you live.

How much do you agree or disagree with the following statements…
(Tick the box that best applies to you)

<table>
<thead>
<tr>
<th>How much of a problem in your neighbourhood (i.e., within a 15 minute walk of your home) is the following…</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rubbish or litter lying around</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>2. People using or dealing drugs</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>3. People being drunk or rowdy in public places</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>4. Vandalism, graffiti and other deliberate damage to property or vehicles</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>5. Dangerous dogs/irresponsible owners</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>6. Teenagers hanging around on the streets</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
<tr>
<td>7. Not enough things for young people to do</td>
</tr>
<tr>
<td>A very big problem</td>
</tr>
<tr>
<td>A fairly big problem</td>
</tr>
<tr>
<td>Not a very big problem</td>
</tr>
<tr>
<td>Not a problem at all</td>
</tr>
</tbody>
</table>

**SECTION C. NEWS / INFORMATION**

Now we would like to ask you some questions about news and information concerning crime on the Gold Coast.

1. From which of the following media sources do you get information about crime on the Gold Coast? (Tick all that apply)
   - Television
   - Radio
   - Print Media
   - Internet / Mobile Apps
   - Other (Please specify)...

   None (Skip next question)...

2. Which of the media sources marked previously do you get information from the most? (Tick only one)
   - Television
   - Radio
   - Print Media
   - Internet / Mobile Apps
   - Other

3. Which Gold Coast City Council crime safety and reduction programs listed below are you aware of? (Tick all that apply)
   - Business Safety
   - Graffiti
   - Car Theft Prevention
   - Women’s Safety/Information Card
   - Get Home Safely
   - Good Sports Program
   - Party Safe
   - None...

**SECTION D. BACKGROUND**

Now we would like to finish by asking you some questions about your background.

**NOTE:** This information is confidential and is used for research purposes only.

D1. Do you own or rent the dwelling in which you now live? (Tick only one)
   - Own (outright/paying off)...
   - Rent from private landlord...
   - Rent from public housing authority...
   - Boarding/living at home...
   - None (on holiday/visiting)...

D2. What is your country of birth? (Tick only one)
   - Australia...
   - Philippines...
   - New Zealand...
   - Germany...
   - United Kingdom...
   - India...
   - United States...
   - South Korea...
   - Japan...
   - South Africa...
   - China...
   - Other (Please specify)...

D3. Are you of Aboriginal and/or Torres Strait Islander origin? No...
   - Yes, Aboriginal...
   - Yes, Torres Strait Islander...
   - Yes, both Aboriginal and Torres Strait Islander...

D4. When did you move to your current residence?
   - Month (MM) Year (YY)...

D5. In which year were you born?
   - Year (YYYY)...

D6. What is your current legal marital status? (Tick only one)
   - Married / de facto...
   - Separated...
   - Divorced...
   - Widowed...
   - Never married...

D7. Are you… Male...
   - Female...

This is the end of the questionnaire.

Please put the completed survey in the prepaid reply envelope and Post it back to us. No stamp or payment is required.

We appreciate your cooperation and participation.
Appendix B: Notification Letter for the 2014 Gold Coast Community Survey

TO THE HOUSEHOLDER
UNIT NO
<ADDRESS>
<SUBURB>

Dear Gold Coast Resident,

The School of Criminology and Criminal Justice at Griffith University is conducting a community survey of Gold Coast residents. The goal of this study is to obtain information on individuals’ perceptions of crime in their neighborhoods and to measure participants’ levels of fear of victimisation. You were randomly selected to participate in this study because your residential address is located within the Gold Coast.

In the coming days, a survey package will be mailed to you containing a questionnaire, description of the study, and a post paid return envelope. Although your participation is voluntary, I encourage you to complete the survey and return it to me as soon as possible.

The questionnaire will take about 10-15 minutes to finish and information collected from the survey will help us better understand how perceptions of crime and victimisation affect our community. Participants’ responses will be completely confidential.

If you have any concerns or questions regarding this study, please contact me personally at 555 27052 or via email at t.hart@griffith.edu.au.

Sincerely,

Timothy C. Hart, Ph.D.
Chief Investigator
Appendix C: Welcome Letter for the 2014 Gold Coast Community Survey

SURVEY WELCOME LETTER
Ethical Clearance: CCJ/40/13/HREC/0001
School of Criminology and Criminal Justice
Gold Coast Campus

TO THE HOUSEHOLDER
UNIT NO
<ADDRESS>
<SUBURB>

Dear Gold Coast Resident,

A few days ago, I sent a letter to you explaining that the School of Criminology and Criminal Justice at Griffith University was conducting a community survey of Gold Coast residents. The goal of this study is to obtain information on individuals’ perceptions of crime in their neighbourhoods and to measure participants’ levels of fear of victimisation.

The survey package that you received today contains a questionnaire, information sheet that describes the study, and a post-paid return envelope. Please complete the survey and return it to me as soon as possible. Your participation in this study is extremely important.

The questionnaire will take about 10-15 minutes to finish and information collected from the survey will help us better understand how perceptions of crime and victimisation affect our community. Participants’ responses will be completely confidential.

If you have any concerns or questions regarding this study, please contact me personally at 555 27052 or via email at t.hart@griffith.edu.au.

Sincerely,

Timothy C. Hart, Ph.D.
Appendix D: Research Information Sheet for the 2014 Gold Coast Community Survey

RESEARCH INFORMATION SHEET
Ethical Clearance: CCJ/40/13/HREC
School of Criminology and Criminal Justice
Gold Coast Campus

TITLE OF STUDY: Fear of Victimisation on the Gold Coast: A Pilot Study of Situational Contexts

CHIEF INVESTIGATOR: Dr. Timothy C. Hart (PhD) and
STUDENT INVESTIGATOR: Mr. Michael Chataway (B.PsychSc/B.CCJ)

CONTACT PHONE NUMBER: Dr. Timothy C. Hart (PhD) PH: 555 27052

What is the purpose of this survey?

You are invited to participate in a research study conducted by the School of Criminology and Criminal Justice at Griffith University (Gold Coast Campus). The purpose of the current study is to investigate community perceptions of crime on the Gold Coast. We are particularly interested in fear of victimisation within your neighbourhood.

How was I selected for this survey?

You are being asked to participate in the study because you are currently a resident on the Gold Coast and are over the age of 18. Potential participants were chosen randomly from all residential household addresses located within the Gold Coast.

What do I have to do?

Your participation is voluntary. If you choose to take part in this study, complete the enclosed survey and return it to us in the post-paid envelope provided. The survey will only take approximately 10-15 minutes to complete. Data collected for this study will remain completely confidential, thus protecting your identity.

What are the benefits of this research?

There may be no direct benefits to you as a survey participant. However, the aggregate findings of this investigation will give the research team valuable insight into fear of crime and fear of victimisation as well as those factors that affect perceptions of crime on the Gold Coast.

Are there any risks involved with this research?

There is risk involved in all research. However, the current study only includes minimal risks. For example, you may feel uncomfortable in responding to a particular question. Therefore, you are free to not answer any question that may cause you discomfort. You are also free not to participate in the study altogether by not returning a completed questionnaire.
Does this research have any costs associated with participation?

There is no cost to participate in this study. A post-paid return envelope and survey questionnaire is provided to you free of charge.

Is the current study student research?

The current study is a component of a student’s academic program. The research project is conducted under the supervision of Dr. Timothy C. Hart.

Who can I contact if I would like further information about this study?

If you have any questions or concerns regarding the survey, please contact the Chief Investigator, Dr. Timothy C. Hart (email: t.hart@griffith.edu.au; PH: 555 27052).

Do I have to participate?

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of it.

Will information I provide be confidential?

All information gathered through this survey will remain confidential. No reference will be made in written or oral materials that could link any participant to this research. All records of the study will be stored in a locked facility at Griffith University for a 5-year period. After this time, the information gathered will be destroyed.

Can I access the results of this study?

The aggregated results of this survey will be made available to participants upon request. If you wish to access a final report of the results please contact Dr. Timothy C. Hart (email: t.hart@griffith.edu.au; PH 555 27052). Alternatively, findings will be published on the School of Criminology and Criminal Justice webpage upon release of the final report (at https://www.griffith.edu.au).

PARTICIPANT CONSENT

If you would like to participate in this study, please complete the enclosed questionnaire. Once you have completed it, please place it inside the post-paid envelope and return it through your mail provider.

Thank you for your time and consideration!
Appendix E: Reminder Letter for the 2014 Gold Coast Community Survey

SURVEY REMINDER LETTER
Ethical Clearance: CCJ/40/13/HREC/0001
School of Criminology and Criminal Justice
Gold Coast Campus

TO THE HOUSEHOLDER
UNIT NO
<ADDRESS>
<SUBURB>

Dear Gold Coast Resident,

Several days ago, I sent a letter to you explaining that the School of Criminology and Criminal Justice at Griffith University was conducting a community survey of Gold Coast residents. The goal of this study is to obtain information on individuals’ perceptions of crime in their neighbourhoods and to measure participants’ levels of fear of victimisation.

The letter was followed by a survey package that contained a questionnaire, information sheet that described the study, and a post-paid return envelope. Although your participation in this study is extremely important, we have yet to receive your completed survey. Since the study is coming to a close soon, I ask that you take this opportunity to complete your survey and return it today.

The questionnaire will take about 10-15 minutes to finish and information collected from the survey will help us better understand how perceptions of crime and victimisation affect our community. Participants’ responses will be completely confidential.

If you have any concerns or questions regarding this study, please contact me personally at 555 27052 or via email at t.hart@griffith.edu.au.

Sincerely,

Timothy C. Hart, Ph.D.
Chief Investigator
Appendix F: Final Survey Notification Letter

FINAL SURVEY NOTICE
Ethical Clearance: CCJ/40/13/HREC/0001
School of Criminology and Criminal Justice
Gold Coast Campus

TO THE HOUSEHOLDER
UNIT NO
<ADDRESS>
<SUBURB>

Dear Gold Coast Resident,

As you are probably aware of by now, the School of Criminology and Criminal Justice at Griffith University is conducting a community survey of Gold Coast residents. The goal of this study is to obtain information on individuals’ perceptions of crime in their neighbourhoods and to measure participants’ levels of fear of victimisation.

The data collection phase of the project is coming to an end, but I have not received your completed survey. In case the original survey package was misplaced, I have provided the enclosed replacement package. It contains a questionnaire, information sheet that described the study, and a post-paid return envelope. I strongly encourage you take this opportunity to complete your survey and return it today.

The questionnaire will take about 10-15 minutes to finish and information collected from the survey will help us better understand how perceptions of crime and victimisation affect our community. Participants’ responses will be completely confidential.

If you have any concerns or questions regarding this study, please contact me personally at 555 27052 or via email at t.hart@griffith.edu.au.

Sincerely,

Timothy C. Hart, Ph.D.
Chief Investigator
Appendix G: iExperience Recruitment Flyers

App-Based Survey Volunteers Needed
Ethical Clearance: CCJ/12/15/HREC

Investigators:
Dr. Timothy Hart (t.hart@griffith.edu.au)
Dr. Jolon Faichney
Mr. Michael Chataway (m.chataway@griffith.edu.au)

You are invited to participate in an exciting new study conducted by the School of Criminology and Criminal Justice at Griffith University. We are recruiting participants to download an interactive survey app for mobile devices called iExperience.

The iExperience app collects information pertaining to time, place, fear of crime, and everyday experiences.

If you would like to participate in this exciting new study, you can download the app through the following webpage link or scan the QR Code. The survey title is: An Ecological Momentary Assessment (EMA) of Fear of Crime and its Effect on Attitudes Towards Safety: An Exploratory Study.

http://tinyurl.com/hcs4cq2

Once you download the app the survey you need to activate is called the “Perceptions of Crime Survey”. In order to activate a survey you need to use the following Survey USERNAME: POC1

We ask for this study that you have your networks wireless/4G connected and location services activated. This is because the app will send you a survey when you enter a specific location. All you have to do is have the app downloaded on your phone for one month, the app will only send you surveys when you enter specific area’s (therefore there is minimal burden to you as a participant).

We thank you for your participation!
An Ecological Momentary Assessment of Fear of Crime
Ethical Clearance: CCJ/01/15/HREC

http://tinyurl.com/hcs4cq2

INVESTIGATORS:
Dr. Timothy Hart (t.hart@griffith.edu.au [Griffith Criminology Institute])
Dr. Jolon Faichney (School of Information & Communication Technology)
Mr. Michael Chataway (m.chataway@griffith.edu.au [Griffith Criminology Institute])

The purpose of the current study is to investigate the use of mobile devices to collect information about perceptions of crime and attitudes about personal safety.

PARTICIPATING: SEARCH, DOWNLOAD & PLAY:

If you would like to participate in the current study, follow the link on the front of this flyer to the website to download, install and access more information about the iExperience. The study title is: An Ecological Momentary Assessment (EMA) of Fear of Crime and its Effect on Attitudes Towards Safety: An Exploratory Study. The survey that needs to be activated is called “Perceptions of Crime Survey”. You will need a survey username to activate this survey, the username is: POC1.

Thanks for your time & participation!

Griffith Criminology Institute
Appendix H: Research Information Sheet for iExperience Study

RESEARCH INFORMATION SHEET

Ethical Clearance: CCJ/01/15HREC
School of Criminology and Criminal Justice & School of Information, Communication & Technology

TITLE OF STUDY: An Ecological Momentary Assessment (EMA) of Fear of Crime and its Effect on Attitudes Towards Safety: An Exploratory Study

INVESTIGATORS: Dr. Timothy Hart (PhD – Chief Investigator)
Dr. Jolon Faicheny (PhD – Chief Investigator)
Mr. Michael Chataway (BPsychSc/BCCJHons1 – Student Investigator)

CONTACT PHONE NUMBER: Dr. Timothy Hart: (07) 555 27052

What is the purpose of this survey?
You are invited to participate in a research study conducted by the School of Criminology and Criminal Justice, Griffith University (Gold Coast Campus). The purpose of the current study is to investigate the use of mobile devices to collect information about fear of crime and attitudes about personal safety.

How was I selected for this survey?
You are being asked to participate in this study because you are currently a student at Griffith University. All current students were contacted regarding this study and asked to volunteer.

What do I have to do?
Your participation is voluntary. If you choose to take part in this study, you will be asked to complete a short survey on your mobile device. The survey will only take approximately 3 minutes to complete. Data collected for this study will remain completely confidential, thus protecting your identity.

What are the benefits of this research?
There may be no direct benefits to you as a participant in this study. However, findings from the current research will give the investigators valuable insight into the feasibility of using mobile devices as a data collection platform to collect information on individuals’ fear of crime and attitudes towards crime.

Are there any risks involved with this research?
There is risk involved in all research. However, the current study only includes minimal risks. For example, you may feel uncomfortable in responding to a particular question. Therefore, you are free to not respond to any questions that may cause you discomfort. In the event that this was to occur, you can skip the question on your mobile device.

You are also able to discontinue any survey that you’ve started without completing it; and/or withdraw from the study at any time. In the event that this was to occur you must delete the app from your mobile device. This will stop the app from prompting you to complete a questionnaire.

In the event that you experience any distress associated with this survey, you can contact the following free counselling services: Beyond Blue on (07) 5442 4277, LifeLine (24/7) on 13 11 14, Crisis Counselling Service (QLD) on 1300 363 622. University students can access free counselling services by visiting your campus student services building or visiting the following website: http://www.griffith.edu.au/counselling/for-students.
Does this research have any costs associated with participation?

There is no direct financial cost to participate in the current study. However, by participating in the study you will be returning a completed survey back to the research team. Sending a completed survey will result in a very small amount of mobile data being used by your mobile device; however, any cost associated with data usage is at your own expense.

How does the APP Work?

Once a user has subscribed to the survey, the app waits for a triggering event (i.e., when you enter a specific geographic location). After the survey’s event trigger has fired, you will be instructed to begin the survey on fear of crime. The survey app will guide you through a series of screens, each containing survey questions and spaces for answers. After completion of the survey, your survey data will be returned to a secure data server located at Griffith University.

Can my device be detected?

Yes. The current survey utilises location services that are already installed on your device. When you enter a specific geographic area you will be asked to participate in the survey. As this is a voluntary study, you may wish to not complete a survey once you enter an area and are “pushed or pinged” the survey by the app. In the event that you do not wish to or are unable to participate, just ignore the notification on your phone, or alternatively, delete the app from your device. It is important you have location services and your 4G networks activated on your phone.

Who can I contact if I would like further information about this study?

If you have any questions or concerns regarding this research, please contact the investigators, Dr. Timothy C. Hart (email: t.hart@griffith.edu.au; PH: (07) 555 27052). Alternatively, questions can be directed to Mr. Michael Chataway (investigator) via email: m.chataway@griffith.edu.au.

If you have any specific ethical concerns or complaints about the ethical conduct of the research, please contact the Manager of Research Ethics at Griffith University on 3735 4375 or research-ethics@griffith.edu.au.

Is this Student Research?

Data collected from the current study may be used in support of a broader study on fear of crime, currently being conducted by one of our School’s doctoral students.

Do I have to participate?

Your participation in this study is entirely voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university.

Will information I provide be confidential?

All information gathered through this study will remain confidential. No reference will be made in written or oral materials that could link you to this study. All records of the study will be stored on a secure computer at a locked facility on Griffith University’s Gold Coast Campus for a 5-year period. After this time, the information gathered will be destroyed.

As this app collects geographic/location-based data, your location services may be used to detect the location of your device. You must consent to this before you can participate in the current survey (please make sure you read the terms and condition of the app carefully).

Can I have access to the results of the study?

Results of the study will be made available to participants at their request. After you complete the survey you can type your email address to stay in contact for any information about the results of the study.
PARTICIPANT CONSENT

The conduct of this research involves the collection, access and/or use of your identified personal information (i.e., your devices location services). The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University Privacy Plan at http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan or telephone (07) 3735 4375.

If you would like to participate in this study, please complete the questionnaire when prompted. A completed questionnaire will be returned to us automatically, once it is completed and you click ‘Submit’.

Thank you for your participation and time.
Appendix I: Social Media Recruitment Advertisement Blurb

Researchers from the Griffith Criminology Institute are recruiting young adults (18-25 years) living in Southeast QLD for a mobile app study on perceptions of crime. As a participant, you will be asked to download a mobile app and complete a number of surveys for a period of three months. Click the link below to the study website in order to register your email for the app study.

Perceptions of Crime Survey
A mobile app study on perceptions of crime in Southeast QLD. Participate for your chance to win $50-$100 in prizes.

GRIFFITH.EDU.AU
Appendix J: MetricWire Survey Instrument

Section A: Pre-Experiment Questionnaire
Survey Document Developed by Michael Chataway

Information About Survey:
The following section contains the pre-experiment questionnaire that is answered by a potential participant as soon as the MetricWire Survey is activated, and the consent form is completed. Information collected by this brief survey includes: general background information, perceptions of physical health, and self-control. This survey takes approximately 2-5 minutes to complete.

CODEBOOK CAN BE REQUESTED, PLEASE EMAIL: m.chataway@griffith.edu.au
Pre-Experiment Questionnaire

Part A - Background: To begin, please tell us a little bit about yourself

1. Do you own or rent the dwelling in which you now live
   a. Own (outright/paying off)
   b. Rent from private landlord
   c. Rent from public housing authority
   d. Boarding/living at home
   e. None (on holiday/visiting)

2. How long have you lived in your current residence?
   __________________________

3. Please provide a valid postcode for your current residence?
   __________________________

4. What is your country of birth?
   a. Australia
   b. New Zealand
   c. United Kingdom
   d. United States
   e. Japan
   f. China
   g. Philippines
   h. Germany
   i. India
   j. South Korea
   k. South Africa
   l. Other (please specify)
      a. Qualitative String

5. Are you of Aboriginal and/or Torres Strait Islander origin?
   a. No
   b. Yes, Aboriginal
   c. Yes, Torres Strait Islander
   d. Yes, both Aboriginal and Torres Strait Islander

6. In which year were you born?
   __________________________

7. What is your current legal marital status (tick only one)
   a. Married / de facto
   b. Separated
   c. Divorced
   d. Widowed
   e. Never Married

8. Are you…
   a. Male
   b. Female

Part B - Physical Health & Self-Control: Now we would like to ask some brief questions about your perceived physical ability and self-control,

Physical Ability: Select the most appropriate answer that best describes how you feel about each question…

1. I have excellent reflexes (R)

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. I am not agile and graceful

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
### My physique is rather strong (R)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can’t run fast</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I don’t feel in control when I take tests involving physical dexterity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I have poor muscle tone</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I take little pride in my ability in sports</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>My speed has helped me out of some tight spots (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I have a strong grip (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Because of my agility, I have been able to do things which many others could not do (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### Self-Control: Read the following 10 statements and for each, select the answer that best represents you.

1. **I have a hard time breaking bad habits**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a hard time breaking bad habits</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. **I get distracted easily**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I get distracted easily</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. **I say inappropriate things**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I say inappropriate things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4. **I refuse things that are bad for me, even if they are fun**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I refuse things that are bad for me, even if they are fun</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
5. **I’m good at resisting temptation**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

6. **People would say that I have very strong self-discipline**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
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<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
<td></td>
</tr>
</tbody>
</table>

7. **Pleasure and fun sometimes keep me from getting work done**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

8. **I do things that feel good in the moment but regret later on**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

9. **Sometimes I can’t stop myself from doing something, even if I know it is wrong**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

10. **I often act without thinking through all the alternatives**

<table>
<thead>
<tr>
<th></th>
<th>Not at all like me</th>
<th>A Little like me</th>
<th>Somewhat like me</th>
<th>Mostly Like Me</th>
<th>Very Much Like me</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**END OF SURVEY**
Section B: Fear of Crime Survey
Survey Document Developed by Michael Chataway

Information About Survey
The following section contains the fear of crime survey that will be activated after completion of the pre-experiment questionnaire. This instrument is separated into four sections/parts. Part A asks questions in relation to crime and disorder. Part B asks questions in relation to social cohesion. Part C asks more specific questions in relation to the participant’s current location. Finally, Part D asks questions about the participant’s psychological health. This survey takes approximately 5-10 minutes to complete.
Fear of Crime Survey

PART A: Crime - We would first like to begin by asking you some questions about crime within your current location.

How worried are you about the following, in your current location...

1. Being attacked by a stranger

<table>
<thead>
<tr>
<th>Not at all worried</th>
<th>Not Very Worried</th>
<th>Fairly Worried</th>
<th>Very Worried</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

If select ‘Not at all worried’, then ask: In your own words, why are you not worried about being attacked by a stranger?

2. Being robbed or mugged

<table>
<thead>
<tr>
<th>Not at all worried</th>
<th>Not Very Worried</th>
<th>Fairly Worried</th>
<th>Very Worried</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

If select ‘Not at all worried’, then ask: In your own words, why are you not worried about being robbed or mugged?

3. Being harassed, threatened, or verbally abused

<table>
<thead>
<tr>
<th>Not at all worried</th>
<th>Not Very Worried</th>
<th>Fairly Worried</th>
<th>Very Worried</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

If select ‘Not at all worried’, then ask: In your own words, why are you not worried about being harassed, threatened, or verbally abused?

How likely do you think it is that you could fall victim to the following, in your current location...

1. Being attacked by a stranger

| Definitely not going to happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

2. Being robbed or mugged

| Definitely not going to happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

3. Being harassed, threatened, or verbally abused

| Definitely not going to happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
To what extent would your life be affected if you experienced the following, in your *current location*…

1. Being attacked by a stranger

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

2. Being robbed or mugged

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

3. Being harassed, threatened, or verbally abused

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

To what extent do you feel you have control over whether you will become a victim of the following, in your *current location*…

1. Being attacked by a stranger

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

2. Being robbed or mugged

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

3. Being harassed, threatened, or verbally abused

<table>
<thead>
<tr>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

During the next month, how often do you think the following will occur, in your *current location*…

1. Being attacked by a stranger

<table>
<thead>
<tr>
<th>Never in the next month</th>
<th>1-2 times in the next month</th>
<th>1-2 times in the next week</th>
<th>Every day in the next week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

2. Being robbed or mugged

<table>
<thead>
<tr>
<th>Never in the next month</th>
<th>1-2 times in the next month</th>
<th>1-2 times in the next week</th>
<th>Every day in the next week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
3. Being harassed, threatened, or verbally abused

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Never in the next month</th>
<th>1-2 times in the next month</th>
<th>1-2 times in the next week</th>
<th>Every day in the next week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

PART B Incivility and Social Cohesion – Now we would like to ask you about the environment in which you are currently located

How much of a problem is the following, in your current location…

1. Rubbish or litter lying around

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

2. People using or dealing drugs

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

3. People being drunk or rowdy

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

4. Vandalism, graffiti and other deliberate damage to property or vehicles

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

5. Dangerous dogs/irresponsible owners

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

6. Teenagers hanging around on the street

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

7. Not enough things for young people to do

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

8. People urinating in public

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

9. People hooning or driving erratically in the area

<table>
<thead>
<tr>
<th>Problem</th>
<th>Very big problem</th>
<th>Fairly big problem</th>
<th>Not a very big problem</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
How much do you agree or disagree with the following statements (there are no right or wrong answers)...

1. The people who live or frequent this area on a regular basis can be relied upon to call the police if someone is acting suspiciously

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. If anyone in this area was causing trouble, the people who live or frequent here, would tell them off

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
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<td></td>
<td></td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. If I sensed trouble whilst in this area, the people who live or frequent here would help me

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
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<tr>
<td>Question</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4. This area feels like it is a close tight-knit community

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5. This area feels like a friendly place to be or live in

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6. This area feels like a place where the people who live or frequent here look after each other

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

7. In this area most people who live or frequent here trust one another

<table>
<thead>
<tr>
<th></th>
<th>Very strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Very strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

PART C. Area Information – Now we would like to ask you more information about the place where you are currently located.

1. Please use the map below to indicate where you are currently located. If your location doesn’t appear automatically, use the search bar to type in your current address.

2. How would you describe the place that you’re currently in?
   a. Private Residence
      i. Your Home
      ii. Your partner’s home
      iii. Your friends home
      iv. Other private residence
   b. Work/Office
   c. School
   d. Public Place
      i. What type of public place? ____________

3. How often do you come to this place (where you’re currently located)?
FEAR OF CRIME IN TIME AND PLACE

a. Never (this is my first time here)
b. Rarely (a few times a year)
c. Occasionally (a few times a month)
d. Regularly (a few times a week)
e. Always (every day)

Only ask Q5 if Q3 is not equal to "Never".

4. How familiar are you with this place (where you’re currently located)?

<table>
<thead>
<tr>
<th>Not at all familiar</th>
<th>Unfamiliar</th>
<th>Familiar</th>
<th>Very Familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

5. Would you normally feel anxious in this place (where you’re currently located)?

a. Yes
b. No
c. Don’t know

6. Over the past week, do you feel that crime in this place has:

<table>
<thead>
<tr>
<th>Decreased</th>
<th>Remained Stable</th>
<th>Increased</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

PART D. General Feelings– Now we would like to ask you some information about your how you feel right now.

Please indicate the way you feel right now, that is, in the present moment….

1. I feel interested

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. I feel distressed

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. I feel excited

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4. I feel upset

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5. I feel strong

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

6. I feel guilty

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
7. **I feel scared**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

8. **I feel hostile**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. **I feel enthusiastic**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

10. **I feel proud**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

11. **I feel irritable**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

12. **I feel alert**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13. **I feel ashamed**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

14. **I feel inspired**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. **I feel nervous**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

16. **I feel determined**

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
17. I feel attentive

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

18. I feel jittery

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
<th>Extremely</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

19. I feel active

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Quite A Bit</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

20. I feel afraid

<table>
<thead>
<tr>
<th>Very slightly or not at all</th>
<th>A little</th>
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<td>1</td>
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</table>

END OF SURVEY