Exploring the fear of crime gender paradox using quasi-experimental methods

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This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy (Clinical Psychology).

2018

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Abstract

Women's fear of crime is significantly higher than men's. This presents a gender paradox, as men are much more likely to be victims of strangers than women. Explanations for this gender paradox have focused on women's over-attendance to crime rather than men's under-attendance. The psychological literature has also established a fear of threat gender paradox, where women report heightened threat responses and greater anxiety compared to men. Given this, I wanted to explore the fear of crime gender paradox using quasiexperimental methods to address the following research questions. 1. Can we find evidence for the fear of crime gender paradox using innovative experimental methods? If so, are these gender differences a response to crime (as per the fear of crime literature), or to threat (as per the psychological literature)? 2. Is the fear of crime gender paradox a (psychologically defined) fear response? If not, what other emotions are implicated? 3. Is there a correspondence between self-report and physiological measurements of fear of crime?

To explore these questions, I created the Crime and Threat Image Set (CaTIS), conducted three quasi-experiments and wrote four associated papers. In *Paper 1: The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime* we ran three studies (Ns = 24, 29, and 176) to create, evaluate, and validate 78 images that differed in degree of threat (high vs. low) and crime (high vs. low). These images became the CaTIS. In *Paper 2: Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)* we conducted a gender analysis of fear reports made by men and women as they viewed CaTIS images (using Paper 1 Study 3 data, N = 176). In *Paper 3: Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat*, participants (N = 427) reported their emotional state using advanced psychometrically validated measures both before and after viewing CaTIS images. They also wrote responses as they viewed the images. In *Paper 4: Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime*, participants (N = 40) provided self-report and physiological data.

Taken together, the results indicated that the fear of crime gender paradox may not be about fear (*Paper 2*), may not be about crime (*Paper 1, 2, 3*, and 4), and that gender dynamics may reflect reactions to threat rather than crime (*Paper 2, 3, 4*). Self-reporting dynamics also corresponded with physiological measurements of threat response activation for women, but not men (*Paper 4*). In addition to these findings, this research makes unique contributions that include the CaTIS as a new research tool, experimental confirmation of the fear of threat gender paradox, the use of advanced psychometrically validated techniques to assess reactions to criminal threat, and the first physiological study of the fear of crime gender paradox. The implications for individual and public health interventions are discussed.

Acknowledgements

First and foremost, I would like to thank my supervisors Associate Professor Ann Knowles and Doctor Jennifer Beaudry. I appreciate your initial backing of this research, your absolute and steadfast support, and your involvement in every milestone. Your expertise and enthusiasm guided the research and my development as a researcher. Your good humour and consistency were unwavering. I have learnt so much from you, and I am truly grateful.

In the general theme of standing on the shoulders of giants, I wish to also express my gratitude to every researcher who contributed directly or otherwise to this work. Reading your work, hearing you speak at conferences, attending your classes, reading your reviews of my own work, being mentored by you (and quizzed annually by you: namely, Professor Michael Daffern, Doctor Diane Sivasubramaniam, Associate Professor Joseph Ciorciari, and Doctor Julian Oldmeadow) has been a treat and privilege. Thank you.

I wish to acknowledge and thank those who contributed to the research at different points: Doctor Mark Schier, Meg Blackie, Karl Hedger, Michael Zhang, Laura Stitzel, and the Forensic Psychology Lab students. I appreciate your contributions, ideas, and engagement whether we were discussing physiological measures, counting eye blinks, setting up the lab, or sorting out CaTIS image conundrums.

Thank you to every-one who had large or small discussions with me about this research, whether students, colleagues, community members, or unwitting baristas. Thanks to my friends for your cheerleading efforts. Special thanks to my partner, Jack Nicholson, for providing much needed reprieve from the books (and for being especially good humoured when asked to break into the house while I took photos).

I wanted to thank those who has demonstrated the importance of education to me. Learning is an easy thing to love when you have been shown its value.

This work was funded with scholarship support from the Australian Government through the Research Training Scheme (RTS).

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List of Papers

Paper	Thesis Chapter	Title	Journal	Status
1	4	The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime.	Journal of Experimental Criminology	Published (Dec 2017)
2	5	Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)	Sex Roles	Under review (Dec 2017)
3	6	Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat.	British Journal of Criminology	Under review (Jan 2018)
4	7	Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime.	Journal of Experimental Criminology	Under review (Feb 2018)

Please note that I have made small alterations to the Papers for thesis presentation. These changes were limited to the formatting of margins, line spacing, placement of tables and figures, numbering of tables and figures, unblinding the manuscripts, and consolidating reference lists (which are compiled at the end of the thesis with some alterations).

As no other changes were made, the in-text citation style (e.g., Harvard as opposed to American Psychological Association) and language (e.g., American English as opposed to British English) requested by the relevant Journal were retained. Other Chapters (*Chapter 1, 2, 3,* and 8) and References are in American Psychological Association (2011) style and written in British English.

List of Additional Publications

Noon, M. S., Beaudry, J. L., & Knowles, A. (2017, November). *Exploring the Fear of Crime Gender Paradox: a Quasi-experimental Approach*. Paper presented at the 73rd Annual Meeting of the American Society of Criminology, Philadelphia, PA, U.S.A.

Noon, M. S., Beaudry, J. L., & Knowles, A. (2016, September). *Fear of crime: Examining gender differences when assessing crime and threat.* Paper presented at the 19th Australasian Conference on Traumatic Stress (ACOTS), Gold Coast, Queensland, Australia.

Noon, M. S., Beaudry, J. L., & Knowles, A. (2016, September). *Snakes, spiders, crime, oh my! Gender differences when assessing crime and threat.* Paper presented at the Inaugural Australian Psychological Society (APS) Congress. Melbourne, Victoria, Australia.

Preface

On the 22nd September 2012, Gillian "Jill" Meagher went missing. She was an Irishborn woman living approximately three kilometres from my own house in the inner-suburbs of Melbourne, Australia, and we were the same age. It was less than a week of front page articles, nightly news headlines, "missing" posters in the local area, and pervasive social media coverage, before Victoria Police charged Adrian Bailey with rape and murder. Adrian Bailey was a stranger who had seen Jill on the street walking home and struck up a conversation, before pulling her into an alley, raping her, choking her to death, then driving her body to the outskirts of the city and dumping it in a shallow grave. As testament to the influence of her story, approximately 30,000 people walked in a march for Jill three days after her body was found (Milivojevic & McGovern, 2014).

Given my work in the prevention of violence, in the weeks that followed I was invited to local forums to address the community and allay their concerns. In consultation with other speakers, we agreed the key message to the community should focus on the geography of crime: women are generally safe on the streets. We waxed lyrical to the community that, by-and-large, danger exists for women in their homes from people they know, and for men danger is on the streets and from strangers (Australian Bureau of Statistics, 2014b; Heimer & Lauritsen, 2008). This, we said, should be the ongoing focus of our collective attention and energy.

Perhaps unsurprisingly, this was not reassuring. The community were quite clear that we—the alleged experts—were of little help. We tried again to earnestly explain the statistical reality, but suddenly "most of the time" did not ring true to our audience, because this "one time" a statistically unusual event had occurred. Their worst-case scenario had played out and they needed solutions.

Other purported experts moved in to fill the gap that we could not: to provide "real solutions" to the "real issues" rather than policy positions that, to our audiences, probably sounded like the equivalent of "just relax" in a crisis. These new commentators advised audiences of women to walk to cars in pairs, have men act as escorts, stay in after dark, and reconsider the need to leave the house.

From a criminological and psychological perspective, and for reasons outlined in the literature review found in *Chapter 2*, this is terrible advice. This advice reeks of victim blaming scripts by suggesting that victimisation is preventable, and thereby inferring that when victimisation occurs we are accountable and unideal victims (Christie, 1986). This

advice, if followed, may minimise women's community participation and increase the significant physical and mental health risks associated with such isolation (Morgan, 2001). Such advice potentially motivates women to seek protective intimate partners, which may spell actual risk in the home (given the links between men's protection and aggression; Glick & Fiske, 1996; Snyder et al., 2011) or in unwanted sexual encounters (given the rates of acquaintance sexual assault; Jones, Wynn, Kroeze, Dunnuck, & Rossman, 2004). There was also little support for men who were cast as either scary strangers (the bad man) or savvy saviours (the good guy), with little room for them to explore their own and very real vulnerability (Heimer & Lauritsen, 2008).

At this time, I became worried about how these messages may influence community members, and this worry inspired my curiosity. I read the literature to find appropriate solutions and interventions to address the fear of crime, but there were none. The literature gap is so wide, in fact, that there was work to do in determining exactly what fear of crime is and why people experience it. A year later I applied for a PhD program in Clinical Psychology to investigate this research question.

Chapter 1: Overview

Background

Women's fear of stranger victimisation (that is, their fear of crime) is significantly higher than men's (Hollander, 2001; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006) and this presents a gender paradox, as men are much more likely to be victims of strangers than women (Cops & Pleysier, 2011; Henson & Reyns, 2015; Lane & Fisher, 2009). Although there is some suggestion that fear of crime is driven by media reporting (Warr, 2000), and that fear of crime results in poor physical and mental health outcomes (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford, Chandola, & Marmot, 2007), little is known about how to minimise these fears and provide community or clinical interventions.

Overview of Research

A review of the literature revealed a fear of crime gender paradox where women consistently report higher fear of crime than men (Cops & Pleysier, 2011; Jackson, 2009; Moore & Shepherd, 2007) despite women's lower risk of stranger victimisation than men's (Heimer & Lauritsen, 2008). The phenomenon and its explanations (detailed in *Chapter 2: Literature Review*) have not been experimentally tested. Therefore, I wanted to address the following research questions: 1. Can we find evidence for the fear of crime gender paradox using innovative experimental methods? If so, are these gender differences a response to crime (as per the fear of crime literature), or to threat (as per the psychological literature)? 2. Is the fear of crime gender paradox a (psychologically defined) fear response? If not, what other emotions are implicated? 3. Is there a correspondence between self-report and physiological measurements of fear of crime and what might correspondence (and divergence) tell us?

The overall goal for the research was to test core assumptions and drivers of fear of crime gender paradox. This could pave the way for future research in devising interventions and public policy to support greater congruence between people's perceptions of their safety and their actual risk of victimisation, thereby enhancing their wellbeing and maximising their safety.

Thesis structure. To explore these research questions I have conducted an in-depth examination of the fear of crime gender paradox and its drivers. Initially, I created, evaluated, and validated and image set (the Crime and Threat Image Set, or CaTIS; *Chapter 4: Paper 1*). I then examined whether we could establish the fear of crime gender paradox using the CaTIS and whether these reporting differences were influenced by threat or crime (*Chapter*)

5: Paper 2). I later explored whether the fear of crime gender paradox is about fear or other emotional expressions using advanced psychometrically validated tools (*Chapter 6: Paper 3*). In a final study, I measured participants' physiological reactions to the CaTIS as well as their self-reported responses (*Chapter 7: Paper 4*).

These papers are the core of this thesis, which also includes an overview (*Chapter 1*), a literature review (*Chapter 2*), and outline of relevant methods (*Chapter 3*), and a concluding chapter (*Chapter 8*). In this chapter (*Chapter 1: Overview*), I outline the different components of this thesis and explain how they present a coherent story. In *Chapter 2: Literature Review*, I present the relevant criminological and psychological literature on the fear of crime and its associated gender paradox. In *Chapter 3*, I present information on experimental methods relevant to the investigation fear of crime, as well as statistical information not presented in the papers. In *Chapter 8: Conclusion*, I provide a general discussion of the substantial and significant contributions of this body of work, as well as limitations and proposed future directions.

Thematic overview of papers. In each of these studies I explored the fear of crime using experimental methods and the CaTIS (which was created, evaluated, and validated in *Paper 1*). In each subsequent study I used the CaTIS to explore gender dynamics in self-reports of fear (*Paper 2*), then self-reports of emotion (*Paper 3*), then in both the self-reports and physiological records of emotion (*Paper 4*). I found that fear of crime may not be about fear (*Paper 2*), may not be about crime (*Paper 1, 2, 3, and 4*), gender dynamics where women report a greater magnitude of emotional reactions is a response to threat rather than crime (*Paper 2, 3, and 4*), and that there is limited correspondence between self-reports and physiological measures for men, but not women (*Paper 4*). I also found it was possible to establish the fear of crime gender paradox using traditional fear of crime measures and samples of participants who were predominately university students (*Paper 2, 3, and 4*). The work constitutes a coherent and integrated framework and makes significant contributions that address major gaps in the fear of crime scholarship. See Figure 1.1.



Figure 1.1. A diagrammatic representation of how the four papers are integrated and thematically linked.

Outline of papers. Here I summarise the four papers, outline the scholarly contribution each makes to the fear of crime literature, and specify my contributions.

Paper 1. Paper 1 is entitled 'The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime' (Noon, Beaudry, & Knowles, 2017). It was published by the *Journal of Experimental Criminology (JOEX)* in December 2017.

Overview. Paper 1 had two research aims. The first aim was to create, evaluate, and validate a set of images that varied across the dimensions of threat (high vs. low) and crime (high vs. low) for use in further research. The second aim was to determine whether fear reports were being influenced by threat and/or crime, and whether fear of crime developed in response as a projection of broader threats onto crime (the broad pathway) or as a response to crime specifically (the narrow pathway; Hirtenlehner & Farrall, 2013). This research was quasi-experimental with a within-subjects factorial design across three separate studies. Participants rated 178 images in the first two studies (Ns = 24 and 29) and confirmed 80 as suitable for validation. After validation in the third study (N = 176) 78 of the original 80 images were retained, and this became the CaTIS (with four image categories: threat-and-crime which were high-threat and high-crime images and included 20 images; threat-only which were high-threat and lowcrime images and included 20 images; crime-only which were low-threat and highcrime images and included 18 images; and neutral which were low-threat and low-crime images and included 20 images). There were significant main effects of threat and crime, and a significant Threat x Crime interaction on participants' fear ratings. Participants' own ratings of threat—but not crime—had a strong relationship with their fear ratings. I also found that participants who reported experiences of clinical anxiety (generalised anxiety) expressed more worry on traditional measures of fear of crime compared to the non-clinically anxious participants. This indicates that fear of crime may be a reflection and projection of broader fears, and this supports the broad pathway to fear of crime (Hirtenlehner & Farrall, 2013).

Scholarly contribution. The creation, evaluation, and validation of the CaTIS means that fear of crime scholars now have access to an experimental image set for their research. This is a unique and significant contribution as there is no other image set available that is both threat and/or crime-related. The benefit of the CaTIS (or any image or stimulus set) is that we can consider participants' responses to the same

stimulus, introduce experimental variables to explore other relationships, and diversify the methods by which participants can report their fear and other emotions.

Further, there is limited experimental research examining the fear of crime explicitly (cf. Castro-Toledo, Perea-Garcia, Bautista, & Mitkidis, 2017; Kim & Kang, 2018; Yang & Pao, 2015; Ziegler & Mitchell, 2005), so this is a novel contribution. In delineating between the influences of threat and crime, we were able to provide evidence that threat and not crime is a major driver of fear of crime reports. This provides further empirical support for the broad fear of crime pathway (Hirtenlehner & Farrall, 2013). Finally, we were able to explore how participant's anxiety may influence these reports.

My contribution. My contribution to *Paper 1* was to initiate and complete the research design, obtain ethical approvals (Appendix Two), find the images with the assistance of a Research Assistant (Michael Zhang), build the online survey, recruit participants, administer the online survey, and collect data. Once these data were collected, I cleaned and analysed all data under the guidance of my supervisors (Associate Professor Ann Knowles and Dr Jennifer L. Beaudry) and then wrote the first draft of the paper. After ongoing feedback from my supervisors, I undertook further drafting, and submitted the paper to *JOEX*. I then made reviews to the paper based on *JOEX* Reviewer feedback and with Supervisor guidance. My work constitutes approximately 80% of the work for this paper.

Paper 2. Paper 2 is entitled 'Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)' and was submitted to Sex Roles: A Journal of Research on the 9th December 2017. It is now under review.

Overview. The aim of Paper 2 was to tease apart the influences of threat and crime on men's and women's fear ratings using an online quasi-experimental mixed-factorial design with the data from the third study reported in Paper 1 (N = 176, with 81 men and 95 women). Women did report greater fear when viewing CaTIS images than men, but this was influenced by how threatening images were, and not how crime-related they were. This overall pattern of results did not change when anxiety (Eaton et al., 2012) and social desirability bias (Sutton & Farrall, 2005) were considered. Taken together, this suggests that the fear of crime gender paradox is a fear of threat gender paradox, and may reflect differences in men's and women's threat responses.

Scholarly contribution. This paper provides a significant and original scholarly contribution to knowledge by teasing out how threat and crime are uniquely and independently informing fear reports from men and women. It is also the first study to investigate the fear of crime gender paradox using experimental methods. We found that fear of crime gender paradox is perhaps influenced by threat rather than crime and this is a significant and unique contribution to the fear of crime literature. We also found limited evidence that social desirability bias or anxiety were informing gender diversity in fear reports.

My contribution. As *Paper 2* evolved from the initial version of *Paper 1*, please refer to the *Paper 1: My Contribution* section regarding the initial steps of research design and data collection. For *Paper 2* I again analysed the data and produced the first draft of the paper for my supervisors to review. I then made iterative changes to the paper prior to submission to *Sex Roles*. My work constitutes approximately 80% of the work for this paper.

Paper 3. Paper 3 is entitled 'Not just fear and not just crime: An experiment to explore men's and women's emotional reactions to crime and threat' and was submitted to the *British Journal of Criminology (BJC)* on the 25th January 2018. It is now under review.

Overview. For *Paper 3* we wanted to investigate how CaTIS images of threat and/or crime influenced men's and women's emotional states as reported using advanced psychometrically validated tools (e.g., the Positive and Negative Affect Schedule) that were both qualitative and quantitative. This study design was quasiexperimental with a within-subjects factorial design (N = 427, with 195 men and 232 women). Women wrote more fear words than men overall, but this was not influenced by the images they viewed. We investigated emotional states at two separate time points (before vs. after viewing the CaTIS images) and found that women's emotions changed when they viewed high-threat images. Specifically, the women that viewed high-threat images reported increased anger and fear and reduced positive affect and satisfaction when compared to women who viewed low-threat images and men. Participants, regardless of gender, who viewed high-crime images reported increased sadness and anger and reduced satisfaction and sense of safety compared to those that viewed lowcrime images. This suggests that people's responses to crime are more diverse than just fear, and gender differences are a response to threat, not crime. Scholarly contribution. This paper provides a significant and original scholarly contribution to knowledge by using advanced psychometrically validated measures. This meant that we could ascertain emotional content using more implicit measures that by asking (for example) "How much do you worry?" and also were able to assess how threat and crime are uniquely and independently informing emotional reports from men and women. *Paper 3* was the first study to explore the precise emotions being experienced by men and women because of viewing images related to threat and/or crime, and the first to examine these emotions using advanced psychometrically validated measures administered at two time points. The finding that fear of crime is not about fear but sadness, anger, reduced satisfaction, and lowered sense of safety is a significant extension of current knowledge.

My contribution. My contribution to *Paper 3* was to initiate and complete the research design, obtain ethical approvals (Appendix Two), build the online survey, recruit participants, administer the online survey, and collect data. Once the data were collected, I cleaned and analysed all data under the guidance of my supervisors. I then wrote the first draft of the paper. After ongoing feedback from my supervisors, I undertook further drafting, finalised the paper and submitted it to *BJC*. My work constitutes approximately 80% of the work for this paper.

Paper 4. Paper 4 is entitled 'Eyes wide open: Exploring men's and women's self-reports and physiological reactions to crime' and was submitted to

JOEX on the 3rd February 2018. It is now under review.

Overview. For *Paper 4* we wanted to explore how men and women were diversely responding to self-report and physiological data collection methods as they viewed the CaTIS images. We used a laboratory quasi-experimental mixed-factorial design (N = 40, with 20 men and 20 women). Both men and women reported feeling more unpleasant when viewing high-crime images, but only women and not men reported unpleasantness when viewing high-threat images. Participants' gender did not influence their ratings of arousal, but that the type of images they were viewing did. Participants, regardless of gender, blinked significantly less frequently when viewing high threat and high crime images than the other images. Participants' gender did not influence their Galvanic Skin Responses (GSR) recordings, nor did the images they viewed. I also analysed the correlations between these self-reports and physiological measures for all participants and found no significant correlations. When I split the data

by gender and found that there were significant correlations between women's (un)pleasant ratings and GSR, and that the same pattern of results was not observed for men.

Scholarly contribution. This paper provides a significant and original scholarly contribution to knowledge by being the first physiological study to investigate the fear of crime gender paradox specifically. Criminologists have called for the measurement of physiological responses (Warr, 2000) including the analysis of pupil dilation and GSR specifically (Sutton & Farrall, 2005), and in authoring *Paper 4* this research gap has been directly addressed.

My contribution. My contribution to *Paper 4* was to again initiate and complete the research design in consultation with my supervisors and Dr Mark Schier, obtained ethical approvals (Appendix Two), built the surveys, and set up the laboratory with assistance from the Karl Hedger and the team from the Department of Health and Medical Sciences at Swinburne University of Technology. I worked with all participants (N = 40) to collect all data in the laboratory using LabChart and Qualtrics. I then transposed and cleaned all data. To ascertain the eye blink ratings, I engaged Meg Blackie from the Beaudry Lab as a Summer Scholar, who counted all eye blinks in the video files, and I double-coded a portion of these videos (see *Paper 4* for further detail regarding this process). Meg also drafted an annotated bibliography of eye blink research studies. I conducted all data analysis and then wrote the first draft of the paper. After ongoing feedback from my supervisors and Dr Schier I undertook further drafting, finalised the paper and submitted it to *JOEX*. My work constitutes approximately 80% of the work for this paper.

Clinical Relevance and Implications

This PhD (Clinical Psychology) research is clinically relevant due to the measures and methods I have implemented, the nature of the variables I have examined, and the potential outcomes for the research. Although others (e.g., Gabriel & Greve, 2003) have pointed to psychological concepts, my approach to investigate fear of crime using an interdisciplinary psychological lens and methodologies is an important feature of this work. I have used experimental methods often found in the psychological literature, and in doing so I have investigated and integrated this psychological literature into the thesis and its associated papers. I also applied advanced psychometrically validated tools (both self-report and physiological) and mental health variables (e.g.,

anxiety) which is an important contribution and makes application of this work into clinical settings more feasible.

Fear of crime is said to significantly and negatively impact on the community's mental health (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford, Chandola, & Marmot, 2007). This alone should motivate clinicians to examine it. Clark (2003) has mapped fear of crime against the Diagnostic Statistical Manual (DSM) criteria for phobias and argues that there is too little evidence for the required physiological activations exist. This research partially addresses this issue, but there is more work to do in understanding fear of crime in the context of clinical work, particularly as fear of crime so greatly influences people's emotions, cognitions, and behaviours.

Chapter 2: Literature Review

In this chapter I summarise key literature regarding the fear of crime gender paradox. The literature review is comprised of three sections. In the first section I discuss fear of crime, its cost, and how it has been typically measured. I then outline a definitional debate from the literature and ask whether we have or have not measured fear, emotion, responses to threat, or responses to crime. I argue that none of these fundamental components of the fear of crime construct are yet certain.

In the second section, I introduce the fear of crime gender paradox, examining key criminological literature and explanations for women's over-reporting of fear, and men's under-reporting of fear. I also explore occasions where the fear of crime gender paradox has been abated, and why this may be.

In the third section I examine the psychological literature regarding emotions and threat responses, unpacking evidence that may help explain the fear of crime gender paradox. I present evidence and explanations regarding gender differences in emotional expression, including an argument regarding gender roles and gender socialisation. **Understanding Fear of Crime**

From coercion to kidnapping, corruption to credit card fraud, crime is a community concern. In the International Crime Victims Survey (ICVS, as reported in Dijk, Kesteren, & Smit, 2007) for 2004, around 16% of participants from 30 countries reported being a victim of crime. Burglary specifically was experienced by less than 2% of ICVS participants in that same year, but 29% of participants predicted the risk of being burgled in the following year as likely or very likely. As the chance of crime increasing 16-fold within a year is improbable, this is evidence of the incongruence between actual and perceived safety (Dolan & Peasgood, 2007; Jackson, 2009), with some suggestion that the two are not related at all given decreasing perceptions of safety despite decreasing crime rates (Davis & Dossetor, 2010; Van Eijk, 2017). How people perceive their safety and respond to the threat of interpersonal violence committed by strangers is commonly referred to as *fear of crime* (Hale, 1996; Warr, 2000).

The cost of fear of crime. Fear of crime is costly for individuals and communities and is therefore of interest to policy makers in Western countries. Fear of crime directly and indirectly contributes to poor physical and mental health, with those with greater fear of crime also reporting higher rates of depression and anxiety (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford, Chandola, & Marmot, 2007). Fear of

crime creates significant economic costs on account of increased security, avoidance of certain modes of transport and loss of productivity (Dolan & Peasgood, 2007), as well as the costs associated with the multi-billion dollar insurance industry (Insurance Information Institute, 2017), and the estimated \$400USD cost per capita for time spent checking window locks (Anderson, 1999)! Given these significant personal and public costs, governments arguably should focus at least as much on devising strategies to address fear of crime as on fear of actual crime (Borooah & Carcach, 1997; Grabosky, 1995; Warr, 2000).

These high personal and public costs have prompted governments to monitor community perceptions of safety (their synonym for fear of crime) and use this as a measure of justice system effectiveness (e.g., Productivity Commission, 2014) as well as a "best value performance indicator" (Farrall, 2004, p.158). Indeed, the genesis of fear of crime enquiry in the modern West may have been from public policy, when Lyndon B. Johnson was elected to the United States Presidency in 1964 and funded research to better understand the community's response to crime (Henson & Reyns, 2015; Warr, 2000). Thus fear of crime has moved from a marginal topic to one of prominence both in criminological research and public policy (Farrall, 2004).

Measuring fear of crime. Governments and researchers typically rely on largescale surveys exploring victimisation and perceptions of crime (e.g., the General Social Surveys and Personal Safety Surveys [PSS] in Australia, New Zealand and Canada; the Crime Survey of England and Wales; and Gallup's Crime Survey in the United States; as well as the ICVS across 30 participating countries) to measure fear of crime. These instruments focus on how people perceive their personal safety, estimate their risk of experiencing stranger violence, and how they believe they would respond to victimisation (Warr, 2000).

Fear of crime researchers have traditionally collected participant data by obtaining verbal or written reports. As an example, in Australia almost 30,000 people are interviewed over the phone annually to determine how safe they feel when alone at night or during the day at home, walking, and waiting for or on public transport (Australian Bureau of Statistics [ABS], 2014a). To collect these data, governmentfunded representatives may phone community members, asking a range of questions for around 20 minutes. Questions might cover experiences of criminal victimisation and reflections on general community satisfaction and safety, with fear of crime questions only representing a small sub-set of all questions posed. Government and governmentfunded researchers have revised wording and questions over time, with an evolution from binary yes/no choices (e.g., "Do you worry about crime?") to Likert-scale response options (e.g., "How safe do you feel walking alone at night in your local neighbourhood?", Henson & Reyns, 2015).

Governments employ these methods to assess perceptions of safety in quantitative terms; and it is assumed that how safe someone feels is a valid construct when considering their fear of being a victim of a crime. By posing a scenario of being alone, there is an inference of stranger violence (or—potentially—a known person who is unwelcome or unexpected). Fear of being a victim of intimate partner violence (as opposed to experiencing this victimisation) is not a component of the fear of crime questions used in government-funded surveys; and few additional status variables are collected in the broader data set, limiting analysis to demographic generalisations (e.g., Cox, 2012).

Other fear of crime measures have been developed (e.g., Ferraro & LaGrange, 1992; Williams, McShane, & Akers, 2000); however, no one measure is used consistently in the literature (e.g., Kleck, Kovandzic, Tomislav, Saber, & Hauser, 2011; Marzbali, Abdullah, Razak, Maghsoodi, & Mohammad, 2012; Swatt, Varano, Uchida & Solomon, 2013). These self-report measures have been used to gauge fear within a community or situational context (Miller, 2008), to compare fear of crime over time (Brunton-Smith & Sturgis, 2011), to examine inter- and intra-group differences (such as between countries; Bennett & Flavin, 1994; Hummelsheim, Hirtenlehner, Jackson, & Oberwittler, 2010; Meško, Fallshore, Muratbegovic, & Fields, 2008), and to determine relationships between fear of crime and other variables (such as punitive attitudes; Kury & Winterdyk, 2013). Some researchers have qualitatively investigated fear of crime (Ditton, Bannister, Gilchrist, & Farrall, 1999; Lorenc et al., 2013; Van Eijk, 2017), including the use of focus groups (Lupton, 1999a; Tulloch, 2003). This research has found more complex and dynamic emotional responses to crime than the survey responses alone, including mapping attitudes and behaviours associated with high or low fear levels.

Limitations of fear of crime measures. A challenge in using the current fear of crime measures is that they rely on interview methodology and subjective experience (Jackson, 2006). Participants' can be influenced by the interpersonal context of

interview methodologies (Knapp & Kirk, 2003), enhancing the propensity to respond in a socially desirable (Heerwegh, 2009) or stereotypical manner (Francis, Dugas, & Ricard, 2016; Robinson, Johnson, & Shields, 1998). These participants also answer questions grounded in abstract or even imagined concepts, such as how "safe" they feel in certain situations (ABS, 2014a), or how "much they worry" about crime scenarios (Jackson, 2006). Question style may influence participants' responses (Farrall & Gadd, 2004), and when people have had victimisation experiences then the order of questions can also influence their reports (Yang & Wyckoff, 2010). Given these limitations, there has been a renewed focus on improving these measures of fear of crime, as well as developing awareness of the construct's complexity (Farrall & Gadd, 2004; Ditton et al., 1999).

A definitional debate. In these last 40 years much has been written on the definitional issues of fear of crime. A quick perusal of the literature will show that the fear of crime construct has been defined, refined, and deconstructed as a complex and multifaceted concept that pertains to accuracy, risk assessments, threat, vulnerability, reported anxiety, and perceived control (Jackson, 2009; Warr, 2000). Despite attempts to improve fear of crime self-report measures, as well as developing awareness of the construct's complexity (Farrall & Gadd, 2004; Jackson, 2006), there is still uncertainty as to what experiences, ideas, and emotions participants are reflecting on when they provide their survey responses. As such, the exact construct being assessed is unclear (Gabriel & Greve, 2003; Warr, 2000).

Some have argued that the underlying construct is so obvious that to focus on a definitional debate is not essential, with others countering that fear of crime is a concept so vague and poorly defined that definitional clarity is an essential step (Henson & Reyns, 2015). For those invested in this definitional exploration, fear of crime may be best summarised as the emotional response to the threat of crime, and the practical implications (such as attitudes and behaviours) associated with this response (Warr, 2000). To test the associations between risk assessment (a cognitive appraisal) and crime worry (an emotional reaction), Jackson (2009) conducted a survey of 476 London households and established that the ability to physically defend oneself may predict that control and consequence worries that might align with likelihood appraisals. This, in turn, may predict fear of crime reports.

Recent theoretical work has leveraged psychological frameworks to differentiate how emotions, cognitions, and behaviours might be activated in response to criminal threat (Gabriel & Greve, 2003; Gray et al., 2011). Lane, Rader, Henson, Fisher, and May (2014) recently collated the available explanations and put forward that fear of crime is typically described in three parts: 1. an emotional reaction, 2. to threat, 3. that is crime-related. We will now examine each of these components in turn, including whether this emotional reaction is fear.

Have we measured fear? Fear is the emotional response to a threatening object (Witte, 1992). It is distinct from other basic emotions (Ekman, 1992) and has a profile of increased arousal and negative valence (Lang & McTeague, 2009; Öhman, 1993). Fear may activate the fight, flight, or freeze responses of the Sympathetic Nervous System (SNS) and be implicated in amygdala activation (Steimer, 2002). In comparison to the other basic emotions, fear may indicate low levels of certainty and control over what might happen, which may promote risk adversity and pessimism (Lerner & Keltner, 2001).

There are three stages to the process of fear induction (Kenny, 1963, as cited in Thomson, 1979). In the first stage, a threatening object (or the idea of the threatening object; Butler & Mathews, 1987) is presented. Second, an emotional response manifests physiologically (e.g., increased heart rate, perspiration). Third, the person experiences responses that can be short lived (e.g., anxious thoughts, fleeing) or persistent (e.g., avoidance, increasing protection).

The fear of crime emotional reaction may not be exclusively related to fear, but may include dread, confusion, anxiety, concern (Fisher, 2016) as well as worry (Jackson, 2006) and anger (Farrall, 2004). Hough (2004) expresses concern about the use of such terms "as if they were synonyms" (p.173). To explore these points, Ditton et al. (1999) and later Farrall (2004) conducted surveys (N = 2,226) and interviews (N = 164) with Scottish residents and found that they were angry and upset about crime. When participants reported how they would feel if someone broke into their home, and they ranked anger as the most prominent feeling (35%), followed by feeling physically sick/disgusted (18%), vulnerable (13%), fearful (11%), shocked (9%), generally sad (6%) as well as violated (6%), wanting retribution (1%) and other responses (1%). Further, when these high rates of anger were queried, these responses related to the injustice of the crime and police response, with no reported occasion where a participant

was angry towards the imagined offender. Tulloch (2003) found similar reports of anger when conducting focus groups on fear of crime in Australia. It might not be accurate to say that fear alone dictates responses to the threat of criminal victimisation, particularly if the extant measures do not capture threat responses. Given this, the term *fear of crime* could be broadened to *emotional responses to crime*.

Have we measured emotion? In psychology there has been a focus on both quantifying and qualifying emotional expression, including reactions to threatening stimuli. Addressing emotional content is a core tenant of many psychological therapies, as they focus on developing the ability to distinguish emotions from cognitions or behaviours. Specifically, the cognitive-behavioural model (Beck, Rush, Shaw & Emery, 1979) is arguably the largest contribution to the field of psychology in the late 20th Century, becoming a cornerstone of treatment for a multitude of mental health concerns including depression and anxiety (Butler, Chapman, Forman, & Beck, 2006). Importantly, the cognitive-behavioural model distinguishes between cognitions, emotions, and behavioural activations. Under the model, thoughts induce feelings which then promote behaviours.

Clinically, the cognitive-behavioural model is very helpful in explaining our reactions to modern threats. For example, if our manager asked to us to a meeting at 4pm on a Friday, a thought might be: "I'm going to get sacked" met with the feeling of anxiety. Behaviours may include avoiding the meeting; however, the cognitive-behavioural model is limited when explaining real and visceral threats to life (Izard, 1992), of which dangerous animals and criminal victimisation are examples. Here, the automated human threat response relies on an "ask questions later" approach where we may sidestep complicated cognitive processing and move directly to sub-cortical fight-or-flight reactions (Lipp, Kempnich, Jee, & Arnold, 2014).

In reviewing the criminological literature through this psychological lens, it becomes apparent that fear of crime has been a study of cognition as well as emotion (Gabriel & Greve, 2003; Gray, Jackson, & Farrall, 2008b; Hinkle, 2015; Holloway & Jefferson, 1997). Measures include questions that are about cognitive appraisals, because asking participants to hypothetically predict the future or provide an abstract appraisal (Jackson, 2006) is asking them to engage in a cognitive task (Kang, Rangel, Camus, & Camerer, 2011). In a study that did just this, Gray, Jackson, and Farrall (2011) wanted to investigate the cognitive and behavioural processes that underpin apparent reports of emotion. In administering the 2007 London Safer Neighbourhood Survey (N = 2,844), the researchers asked participants to make assessments of whether they were worried about an event or anxious in a more diffuse sense. They found that 65% people were not worried. Of the remaining participants, 14% were anxious and 21% were worried. Of the anxious and worried participants, 27% had a dysfunctional response to their anxiety or worry, with only 8% having a functional response (according to the researcher's determinations). The authors argued that previous attempts to examine emotional reactions without this level of scrutiny were underselling the complexity of the fear of crime construct.

People have complex responses to threatening stimuli informed by the nature of the stimuli and individual differences (Carretie et al., 2009; Garfinkel et al., 2014; Miltner et al., 2005). It is important that we better understand the nature of emotional expression, how this is similar and different between individuals and groups, and under what circumstances. This may also permit us to better understand if people are having an emotional response to crime or a *cognitive, emotional, and/or behavioural response to crime*.

Have we measured a threat response? Whether fear of crime literature has examined cognitions more than emotions (Rader, 2004) is not only a question of item wording across the measures we have discussed, but a question of methodology. Strictly speaking, threat cues are required to gather emotive response data associated with fear (Garofalo, 1981). This methodology has not been used in fear of crime literature apart from in a few experimental examples.

Ziegler and Mitchell (2003) experimentally investigated how age and vicarious exposure to crime might influence participants' fear of crime reports. The authors randomly assigned younger (18 to 29 years, n = 30) and older (61 to 78 years, n = 26) participants to either an exposure condition which required them to watch a vivid reenactment of a home invasion from the television show *Unsolved Mysteries*, or a control condition where participants watched a newscast report regarding a bank robbery. The researchers found that watching vivid re-enactment did result in higher fear of crime reports using traditional survey measures, but only for younger participants. This research does provide an example of use of an experimental stimulus and control condition by which to assess different responses, but still did not ascertain in-the-moment reactions to the videos using advanced psychometrically validated or physiological methods and did not investigate gender.

Yang and Pao (2015) investigated the broken windows thesis (where signs of community disorganisation such as broken windows, litter, or graffiti are said to promote the community's concern about crime) using a quasi-experimental design. In this research they showed students (n = 241) and police (n = 120) 100 images of places that varied in terms of physical disorder (high vs. low) and social disorder (based on stereotypes of race and social class). The dependent variables included participants' ratings of community disorganisation in the image as well as their reaction times to provide such ratings. They found that images of community disorder were rated as more disorderly than those images that had no community disorder, and that these relationships were moderated by the different independent variables. This is not a fear of crime experiment, per se, but it does provide an example of momentary responses to community disorder stimuli that is linked to the fear of crime literature (Sampson, Raudenbush, & Earls, 1997; Snedker, 2015; Solymosi, Bowers, & Fujiyama, 2015).

To measure fear of crime in-situ, Chataway, Hart, Coomber, and Bond (2017) piloted the use of Ecological Momentary Assessments (EMAs): a data collection method that has been gaining prominence in public health and clinical settings. Participants (N = 20) were sent SMS messages to complete surveys when they were in 10 pre-selected locations near an Australian university. Surveys included Jackson's (2006) fear of crime measure and another to gather information about community disorganisation signs that participants could observe (e.g., litter). Precise conclusions regarding the different locations were not made due to the small sample size, but the overall conclusion was that garnering momentary reactions to different spaces relevant to participants' fear of crime can be undertaken with EMA technology. Further research in this domain is anticipated, particularly as other researchers are also piloting these technologies (e.g., Solymosi et al., 2015).

In a fourth recent example, Castro-Toledo, Perea-Garcia, Bautista-Ortuno, and Mitkidis (2017) ran a quasi-experiment in a park in Denmark. The researchers altered the lighting conditions in the park (covered street lights vs. no-coverings) and monitored participants' (N = 16) heart rate as they walked through the park. They found that heart rate was higher for participants assigned to the condition with poorer street lighting
(low-luminosity) than those assigned to the high-luminosity condition, but that this was not reflected in participant's self-reports of fear as reported after their walk.

Finally and most recently, Kim and Kang (2018) compared participants' physiological reactions as they viewed street-scape images taken in the day or in the night. They found that participants' (n = 13) who had reported high fear of crime had greater physiological responses (i.e., Galvanic Skin Response [GSR]) when viewing the images than when viewing blank screens, whereas participants' (n = 14) who had reported low fear of crime had heightened physiological responses when viewing blank screens than when viewing the images.

Here I have outlined the experimental efforts used to measure fear of crime in the moment and as it is being experienced by these participants. These researchers have established that different experimental conditions do influence fear of crime levels, which indicates that different circumstances may promote different threat reactions. If we continue to unravel the fear of crime concept in consideration of the threat response, our wording may shift again from the cognitive, emotional, and/or behavioural response to crime to the *cognitive, emotional, and/or behavioural response to the perceived threat of crime*.

Have we measured a crime response? Finally, we need to query whether fear of (or, more accurately perhaps: threat responses towards) crime is about crime, or a projection of more diffuse anxieties. In addition to the experimental studies outlined, other research has drawn links between environments and fear of crime (Fisher & Nasar, 1995; Moore & Shepherd, 2007; Solymosi et al., 2015) and the media and fear of crime (Davis & Dossetor, 2010; Heath & Gilbert, 1996; Wagner, 2015) with media coverage of certain crimes said to lead to the increase in fear of crime (see Warr, 2000 for a summary). That said, this research relies on assumptions that environments that show signs of community disorganisation, or media coverage of violent crime, might directly influence fear of crime rates. Indeed, fear of crime scholarship has been the business of criminologists (whose work is galvanised by the concept of crime), so it seems an odd idea to take the crime out of fear of crime. That said, there is some evidence that fear of crime as it has been measured is not about crime at all.

Hirtenlehner and Farrall (2013) investigated whether fear of crime is about crime (the narrow pathway explanation largely favoured by the British and American schools of criminology), or about general anxieties projected onto crime (the broad pathway or generalised insecurity model explanation as favoured by the European schools of criminology). These investigators used linear structural equation modelling to analyse self-report survey data from Austria (N = 653) and found slightly more support for the generalised insecurity model. This method of analysis meant that relationships between variables were ascertained, but the direction of these relationships were not. This limits our ability to draw conclusions about what came first: the fear, or the crime. In some support of the general insecurity model, general fear has been found to predict fear of crime reports in a Trinidad study (N = 1,197, Chadee & Ng Ying, 2013), as has economic insecurity (Britto, 2013).

Some of the most compelling evidence of the seriousness and impact of fear of crime may provide support for the broad definition of fear of crime. The significant evidence for links between mental health concerns and fear of crime rates have been coupled with an assumption that the direction of this relationship is that fear of crime leads to anxiety and depression (Jackson & Stafford, 2009; Stafford et al., 2007; Vitelli & Endler, 1993). For example, Klama and Egan (2011) examined psychological dimensions and explored whether fear of crime was correlated with higher levels of depression and anxiety, as well as personality dimensions. In their study, participants (N = 232) completed an online survey that included Ferraro and LaGrange's (1992) measure of fear of crime, as well as the NEO-FFI-R Personality Inventory, Hospital Anxiety and Depression Scale (HADS), Sense of Control Mastery Scale, and the Attitudes to Punitiveness (APS) scale. Mental health was measured by whether the person had experienced depression or anxiety in the past year. A latent variable of distress was found, and this latent variable was correlated with high neuroticism, tendency for depression and anxiety, introversion, a low sense of control and low conscientiousness. Both this latent variable of distress as well as high conscientiousness largely accounted for variation in fear of crime reports, but this correlation alone does not infer causation.

Crime may serve as another domain onto which anxious individuals can project their fear. Further, the evidence that crime rates and fear of crime do not correlate (Davis & Dossetor, 2010; Dolan & Peasgood, 2007; Jackson, 2009) could provide more support for the argument that fear of crime is not reflecting crime threat at all. Further investigation of these dynamics is essential to determine if fear of crime is about crime, and in proposing appropriate solutions and interventions. A proposed solution to the fear of crime definition dilemma. In this short review of the literature, we have established that fear of crime might be a cognitive, emotional, and/or behavioural response to the perceived threat of crime. Here we have unpacked this further as the *cognitive, emotional, and/or behavioural response to a perceived threat that is crime-related but may not be due to this threat being crimerelated*! Even the keenest bureaucrat might have trouble enjoyably forming an acronym from such a term, and we can appreciate that fear of crime is therefore a useful (if largely inaccurate) short-hand. For this reason, I continue to use the term fear of crime throughout this thesis but do so with an acknowledgement of this discussion.

Gender Dynamics and Fear of Crime

Jackson (2009) postulates that the more than 40 years of fear of crime research clusters across two central themes. One is that people have more fear of crime than is reasonable given very low levels of crime; and the second is that crime rates (or, actual risk) as well as previous experiences of victimisation do not correlate with the level of fear expressed by the community. If fear is considered a reasonable response to threat, the degree of fear expressed by the community is much greater than it should be when comparing the amount of fear to the likelihood of victimisation.

The finding of high fear despite low risk is not a consistent across all demographics. Statistically, men are at greater risk of being victims of strangerperpetrated crime than women (ABS, 2014b; Heimer & Lauritsen, 2008). This presents a paradox, as women report much greater fear of stranger victimisation than men despite their lower risk (Hollander, 2001; May, Rader, & Goodrum, 2010; Schafer, Huebner, & Bynum, 2006). Gender is by far the most pervasive theme in relation to determinants of fear of crime, with men being less fearful of being a victim of an unknown assailant than objectively they should be, and women being more fearful (Cops & Pleysier, 2011; Henson & Reyns, 2015; Lane & Fisher, 2009).

The focus of research around this paradox has been on women's overestimations rather than men's under-estimations of risk (Lee, 2018). The basis of this gender difference has been proposed to be evolutionary by Fetchenhauer & Buunk, (2005), but overall the scholarship points to the fear of crime gender paradox being a socialised phenomenon (Gilchrist, Bannister, Ditton, & Farrall, 1998; Rader & Haynes, 2011). Some of the content outlined here reproduces that presented in *Papers 2* and *3*.

Women's fear of crime. There are several explanations for women's high fear of crime. The first explanation is that high levels of fear of crime reflect unrecorded victimisation experiences which are not identified by current data collection tools (Broll, 2014). Recent research has indicated that women's self-reports of unrecorded victimisation coincide with increased fear of crime (Sironi & Bonazzi, 2016). Women experience a high degree of under-reported violence in the home (Flood & Fergus, 2008), which may contribute to the belief of threat outside of the home. Women are also subjected to a high degree of harassment and sexual objectification which may foster a sense of constant threat (Junger, 1987; Lupton, 1999a; Watson, Marszalek, Dispenza, & Davids, 2015). Women may also be more likely to experience public incivilities (harassment that is not gendered or sexualised) at higher rates (Bastomski & Smith, 2017). Smith and Torstensson (1997) investigated this hypothesis by analysing data from the Stockholm Survey (N = 3,882). They found that women's belief in their physical vulnerabilities combined with men minimising their reports of anxiety influenced the gender paradox more than women's experiences of under-reported crime and harassment.

The second explanation is that women may couple the possibility of some crimes (e.g., a home invasion) with the likelihood of being sexually assaulted (Warr, 1985) or physically harmed (Hirtenlehner & Farrall, 2014), and this is called the 'shadow of sexual assault hypothesis' (Ferraro, 1996; Warr, 1985). The findings from a recent survey of Swedish university students (N = 1,051) by Özaşçılar (2013) supported this hypothesis, as fear of sexual violence was predictive of fear of non-sexual violence, and when this was controlled for, these fear of crime gender differences dissipated. Similar dynamics have been established with Turkish (Özaşçılar & Ziyalar, 2017) and American students (Lane, Gover, & Dahod, 2009).

The third explanation is that women receive a higher number of warnings about sexual vulnerability than men (Harris & Miller, 2000; Katz, 2013), and this could inform women's fear reports (Burt & Estep, 1981; Dobbs, Waid, & Shelley, 2009). A woman's community or family may provide these warnings, with the family unit playing a key role in establishing a sense of safety or fear (Davis & Dossetor, 2010). Recent studies have shown that parents are more restrictive of girls' independence, and that this is linked to parental fear of stranger victimisation (Crawford et al., 2015), particularly that of a sexual nature (Vozmediano, San-Juan, Vergara, & Alonso-Alberca,

2017). Adolescent girls have also reported more fear than boys, with these same girls being more restricted by their parents in their use of leisure time than boys, enhancing girls' feelings of fear outside of the home (De Groof, 2008).

This kind of contagious worry of others can also impact adult women. To explore these concepts further, Gilchrist et al. (1998) conducted 64 interviews with men and women from Glasgow, Scotland regarding community indicators of (dis)order that might increase or decrease fear of crime. This sample was taken from a group of 168 individuals who had previously completed a survey whereby participants were categorised as typical (high-fear women, low-fear men) or atypical (high-fear men, lowfear women). These interviews revealed that women, but not men, highlighted "contagious worry" (p.290) as a concern. High-fear women also reported being more greatly influenced by their partner's stipulated fear for them than low-fear women were. In related research, Van Eijk (2017) recently conducted 56 interviews with heterosexual people from 28 romantic couples and found that the men held the impression that being a good partner was being protective of their wife or girlfriend, and that their fear of crime was fear for their partner being a victim.

Stories of criminal victimisation that are shared in the public sphere may also inform women's fear of crime reports. Phelan, Sanchez, and Broccoli (2010) suggested that stories that reinforce gender stereotypes of women's vulnerability (the damsel in distress) and men's benevolent sexism (the knight in shining armour) promote women's fear of crime. Sharing these stories may reinforce social hierarchies where men are capable and in control, and women are vulnerable and in need of rescuing. As further evidence for the role of fear-inducing messages, Parrott & Parrott (2015) analysed fictional depictions of women and men on television and found that white women were more frequently attacked by strangers, seriously harmed, or sexually assaulted than men or non-white women. How real-life women are portrayed when they are victims also reinforces these messages of women's vulnerability. For example, Hollander and Rodgers (2014) conducted an analysis of 16 newspapers across a year period and examined stories where women were victims of sexual assault. They found that these stories had limited commentary regarding the woman victim's agency, such as minimal reporting of assertive strategies she employed to defend herself.

It has been speculated that there is also potential for a feedback loop between fear and experiences of violence. Women's high fear of crime may relate to preferences for aggressive intimate partners, perhaps to act as a protector (Ryder, Maltby, Rai, Jones, & Flowe, 2016; Snyder et al., 2011). This may create vulnerability to violence in the home, which may then enhance fear of crime outside of the home.

Finally, gender dynamics may reflect other intersectional issues such as poverty, and that these experiences are inextricably linked to gendered experiences (Franklin & Franklin, 2009). For example, a study of 219 women living in Canadian public housing found that women's fear of crime was not paradoxical, but a reflection of their living conditions (Alvi, Schwartz, DeKeseredy, & Maume, 2001).

In summary, many women are socialised to fear stranger victimisation (Holloway & Jefferson, 1997). Socialisation occurs through experiences of victimisation and harassment, as well as safety messages targeted towards women and girls and through intersectional experiences of vulnerability. In combination, this may enhance perceptions of vulnerability and risk, leading women to report more fear of crime than men.

Men's fear of crime. If women are socialised to fear crime, then men in Western societies are socialised to not express fear, with masculine ideals found to align with emotional restraint and a stereotype of fearlessness (Goodey, 1997). Men may possess increased "self-confidence and perceived autonomy" (Grabosky, 1995, p.2) that can lessen their fear of victimisation. Some men view crime as an opportunity to assert oneself, with men more frequently identified as "well protected" individuals who may view crime as a situation that they can handle (Gilchrist et al., 1998). Tulloch's (2003) focus group research with men and women also found that men were much more likely to respond to the threat of crime with a belief of being well protected. Tulloch determined four different kinds of responses to the threat of crime. These were: the tactical risk managers who perceived they had moderate risk and moderate anxiety; the vigilant participants who had perceived low risk and low anxiety; the well-protected, who had perceived low risk and minimal anxiety; and the besieged participant, who had perceived moderate risk and high anxiety. Of the four groups, men were underrepresented in each group except for the well protected. This group viewed a criminal incident as the opportunity to assert oneself, and flagged anxiety as counterproductive to positive outcomes. This may represent masculine attitudes towards the threat of crime.

Men may experience criminal victimisation by strangers more frequently and more severely (ABS, 2013), but mistreatment from others who are responding to this criminal victimisation (aka. secondary victimisation; Campbell & Raja, 1999, 2005) may be less pronounced or less feared by men than by women. This may be because men are typically less exposed to negative responses from others when they have been victims of violent crime compared to women (Andrews, Brewin, & Rose, 2003).

Men may also under-report their fear due to gender stereotypes (Smith & Torstensson, 1997). Sutton and Farrall (2005) analysed fear of crime data from 288 households, where participants had also completed a lie scale. The authors found that high lie-scale scores were related to decreased fear reports for men (and unrelated to women's scores), suggesting that men are more private about their fear than women. In an extension of this study, Sutton, Robinson, and Farrall (2010) asked 100 British participants to either represent themselves in the best possible light (impression management) or respond honestly when reporting their fear of crime. They found that men who were impression managing reported less fear of crime than men who were asked to respond honestly (and that women who were impression managing reported more fear of crime than women who were asked to respond honestly).

Fear reports may also link to gendered identities, with Cops and Pleysier (2011) analysing data from the Flemish Youth Monitor of young people aged 14 to 30 years (N = 3,248). The researchers found that more masculine boys report less fear of crime than their less masculine male counterparts, and that more feminine girls report more fear of crime than their less feminine female counterparts. It is noteworthy that the gender paradox does not emerge when fear of crime is reconceptualised as anger rather than anxiety, which perhaps activates male gender stereotypes regarding socially acceptable emotional expression (Ditton et al., 1999). Taken together, there strong evidence that fear of crime reports are influenced by gender stereotypes where men are expected to minimise their fear reports.

Abating the gender paradox. There is some evidence that simply changing how we measure fear of crime might shift or alter men's and women's reports (Ugwu & Britto, 2015). The focus on improving fear of crime measures since the 1970s may account for fear of crime increasing as the gender gap has narrowed (Haynie, 1998). This dynamic may reflect changes to measurement more than changes to people's lived experiences of fear of crime. As an exemplar of this, Moore and Shepherd (2007) investigated data from approximately 40,000 participants in the British Crime Survey and found some evidence that a single fear of crime measure about walking at night might manifest the gender paradox, with more global questions about personal loss (rather than personal harm) lessening the extent of the gender paradox. In other evidence that measurement strategies inform gender dynamics, researchers conducted a telephone survey of 269 New Orleans residents and found that, when specifying crime types, men did report more fear than women towards the types of crime they were more likely to experience (Reid & Konrad, 2004). In research specific to public restrooms, men also reported greater fear of crime (Moore & Breeze, 2012).

In summary, the fear of crime gender paradox is one of the most pervasive and compelling concepts in the fear of crime literature. Although the paradox is often found, explanations for the paradox are not well tested. This research presented across the papers looks to explore the paradox in new ways, by testing a range of key assumptions.

The need to intervene. Given the threat response is an adaptive mechanism that keeps us safe from harm (Van der Kolk, 1994), we should consider whether women's heightened fear of crime and men's comparative nonchalance might enhance their safety. If this were the case, and with community safety being a high priority, then we may not seek to intervene (Warr, 2000). Here we explore whether fear of crime responses keep men and women any safer.

Men's low fear might indicate masculinity (Keith, McClure, Vasquez, Reed, & May, 2015), social status privilege (Conway, Di Fazio, & Mayman, 1999), and the associated "self-confidence and perceived autonomy" (Grabosky, 1995, p.2) that such privilege may afford. That said, men's lower fear (Smith & Torstensson, 1997) may link to enhanced risk taking (Eckel & Grossman, 2008) which is life limiting. This is both in the short-term (because men are not always provided with social permissions to expose their emotional selves) and the long-term (with men dying younger than women despite their higher status; Assari, 2017). For example, men account for 70% of homicide victims (Heimer & Lauritsen, 2008), three in four car accident fatalities (ABS, 2015; Jacobs, Aeron-Thomas, & Astrop, 2000), and sixteen in every seventeen shark attack victims (Mannix, 2015). There is some evidence that high masculinity increases victimisation risk for men (but not women; Daigle & Mummert, 2014).

Women's fear might indicate their lower social status (Conway et al., 1999; LaFrance, 2002) but also effectively keeps women in this lower status through providing subtle reminders of their vulnerability and limiting their community participation. If women's enactment of feminine fear scripts lowers community participation and interaction with others, that might logically limit the per capita likelihood of crime incidence for these women overall (because if someone does not interact with strangers then their risk of stranger victimisation is lower). If femininity precedes fear of crime (Cops & Pleysier, 2011) and fear of crime drives women to select protective and aggressive partners (Ryder et al., 2016; Snyder et al., 2011) this may increase women's risk of violence not from strangers but from intimates, where the bulk of risk for women exists (Flood & Fergus, 2008; Pain, 1997). Women's feminine overestimations and men's masculine underestimations of fear might increase risk in both cases.

Gender Differences in Threat Responses

There is evidence that the fear of crime gender paradox may reflect gender differences in threat responses (including to threats that are not related to crime). Given we have presented and discussed a summary of the criminological literature, we will now consider the psychological and clinical literature regarding men's and women's diverse emotional reactions to more general threats. A far more expansive discussion of gender differences in emotional experience and expression can be found in Brody and Hall (2010), an excellent review of the literature regarding anxiety differences between men and women in McLean and Anderson (2009), and a succinct summary of the literature of gender differences in response to the threat of violence in Harris and Miller (2000). Some of the content outlined here reproduces that presented in *Paper 4*.

Psychological gender differences. There are documented differences in how men and women express and experience their emotion, and this may contribute to different rates of clinical diagnoses for men and women.

Emotional expression. Women are much more likely to report their emotions than men (Brody & Hall, 2010; Kamvar & Harris, 2009) and specifically report disgust (Olantunji, Sawchuk, de Jong, & Lohr, 2006), negative affect, and worry (McLean & Anderson, 2009) at higher rates than men. In a study of data from 37 countries, Fischer et al. (2004) found women were more expressive of powerless emotions (e.g., sadness) and men were more expressive of powerful emotions (e.g., anger). These reported attitudes are consistent with observed behaviours, including a meta-analysis which found that girls' facial expressions indicate more positive and internalised emotions

when compared to boys, who facially expressed more externalising emotions (Chaplin & Aldao, 2013). In another behavioural study (N = 119), women reported more anxiety about a tarantula and were also more avoidant of touching it compared to men (McLean & Hope, 2010). Men's and women's reported emotions and behaviours thereby fit gender stereotypes which align fear with femininity and fearlessness (or, specifically, bravery and anger) with masculinity (Bem, 1981; Brody & Hall, 2010).

Emotional experiences. There is research establishing that women are not only reporting heightened emotions compared to men but also experience greater SNS activation when facing stressful or threatening stimuli. For example, women may display greater GSR (Kemp, Silberstein, Armstrong, & Nathan, 2004; Mardaga, Laloyaux, & Hansenne, 2006; Rohrmann, Hopp, & Quirin, 2008), show more facial expression (Thunberg & Dimberg, 2000), and blink more (Bianchin & Angrilli, 2012; Sforza et al., 2008) towards unpleasant stimuli compared to men. This may cross cultural boundaries; for example, when women from two cultural groups (European Americans compared to Hmong Americans) recalled emotional events they then reported more emotion, expressed more emotion on their faces, and exhibited a greater magnitude of GSR change compared to men (Chentsova-Dutton & Tsai, 2007). Bianchin and Angrilli (2012) also found that women self-reported greater emotional reactions and exhibited an enhanced startle response compared to men. That said, men may exhibit greater physiologically responsive to pleasant images (Greenwald, Cook, & Lang, 1989, Sarlo et al., 2005). This evidence suggests that women not only report more emotions than men but may experience a greater magnitude of physiological activation to threat as well.

Brain imaging researchers have also reported some gender differences when men and women are reacting to threat. McClure et al. (2003) used functional Magnetic Resonance Imaging (fMRI) as they showed adults (N = 17) and young adults (N = 17) pictures of faces that varied in terms of ambiguity (present vs. absent) and threat (present vs. absent). Adult women showed distinct activation across the brain in specific areas (the orbitofrontal cortex and amygdala), whereas young women, young men, and adult men showed general activation across the brain rather than only in those specific areas. Other imaging studies have found that men's and women's brains activate in different areas when viewing threatening images such as knife wielding attackers (Biggs, Brockmole, & Witt, 2013), but the behavioural implications of these findings are not clear.

Although there is some evidence that men's and women's self-reported differences in emotional expression correspond with physiological gender differences, McLean and Anderson (2009) and Brody and Hall (2010) conducted reviews and posit that there is a lack of consistency in these findings. There are many studies that have found significant differences in men's and women's self-reports of emotion but no statistically significant differences in their physiological data. For example, Kelly, Tyrka, Anderson, Price, and Carpenter (2008) found that women reported greater fear than men, as well as greater confusion, greater irritability, and less happiness, but women's cortisol activity and heart rate were not significantly different from men's. Codispoti, Surcinelli, & Baldaro (2008) found that women self-reported more arousal and less pleasurable feelings in response to an unpleasant film of surgery than men did, but that women's GSR was not significantly different from men's. Chaplin, Hong, Bergquist & Sinha (2008) found that women reported more anxiety and sadness, but that men and women showed no statistically significant differences in their heart rate and blood pressure. When participants (N = 43 and 67) watched affective films in Kring and Gordon's (1998) studies, women self-reported greater emotional expression than men, but men physiological reacted more than women. Taken together, women have been found to self-report higher rates of arousal than men when looking at unpleasant or threatening images, but physiological differences have not been consistently shown (Bianchin & Angrilli, 2012; Bradley, Codispoti, Sabatinelli, & Lang, 2001) with many researchers finding contradictory results (Kajantie & Phillips, 2006; Kelly et al., 2008) that may suggest men and women are having physiological experiences that are more similar than different (McLean & Anderson, 2009).

Clinical diagnoses. These gender difference in emotional experience and expression may extend to clinical concerns, with women also experiencing higher rates of anxiety disorders where fear is a feature (e.g. specific phobia, generalised anxiety, social anxiety, panic disorder, agoraphobia, and nightmare disorder, American Psychiatric Association [APA], 2013; McLean & Anderson, 2009) than men. This includes animal phobias, where women report symptoms at two to three times the rate of men (Fredrikson, Annas, Fischer, & Wik, 1996).

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Empirical research confirms these diagnostic assertions, with women predominantly experiencing mood and anxiety disorders in which they internalise liability, and men predominantly experiencing anti-social and substance use disorders in which they externalise liability (Eaton et al., 2012). Professional who provide diagnoses may enact these stereotypes, with experimental studies showing that clinicians tend to diagnose women more often, and with more emotional mental health concerns (e.g., depression, anxiety, borderline personality disorder, histrionic personality disorder) than men (e.g., Garb, 1997; see Winstead & Sanchez-Hucles, 2008, for a discussion). Whether socialised, biological, or a diagnostic bias; differences in men's and women's clinical experiences are an important dynamic to consider in investigating the fear of crime gender paradox.

Variables that may inform gender dynamics. In this section I explore how gender identity and impression management, memory biases, anxiety, and the threat biases may inform the fear of crime gender paradox as it has been historically measured and understood.

Gender identity and impression management. Gender identity and reporting differences may influence men's and women's reporting differences, with recent analysis of a sub-sample of the USA National Longitudinal Study of Adolescent Health (N = 3,664) revealing that high masculinity correlated with greater expressions of anger, and higher femininity with greater expressions of depression (Keith et al., 2015). Men's impression management may also negatively correlate with their reports of anxiety towards (non-crime-related) threat (Asendorpf & Scherer; 1983). Both men and women may actively regulate emotional expressions that contradict the gender stereotypes of men being fearless, and women being fearful and emotional (Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998). In the health sciences, Courtenay (2000) provided a complementary argument that men's risk taking behaviour is not necessarily a result of their masculine identities, but an expression of these masculine identities. That means that an expression of fearlessness is an expression of maniness.

Memory biases. Gender stereotypes may become more embedded through processes of memory recall. Barrett, Robin, Pietromonaco, and Eyssell (1998) examined emotional expression by asking participants (N = 70) to rate their emotional disposition at one point in time (global ratings) and to also record their emotions directly after every interaction they had for one week. They found that global ratings were more gender

stereotypical than the reactions recorded after each interaction. Grabe and Kamhawi (2006) ran an experiment where men and women (N = 75) self-reported their reactions to news stories from television shows such as *Dateline* that were positive, negative, or neutral. They found that men reported greater arousal to negative news stories, as well as greater memory and comprehension for these stories compared to women who reported more avoidance to negative stories but more arousal towards positive stories, as well as greater memory and recall for these positive stories. These studies may support a theory that we store or process memories that align with gender stereotypical expectations (Brody & Hall, 2010).

Anxiety and the threat bias. Levels of anxiety impact on emotional reporting regarding threat, with people who are highly anxious and highly defensive about this anxiety being both vigilant and avoidant in their emotional response to threat (Derakshan, Eysenck, & Myers, 2007). Given that fear is an emotional response to threat cues, people with higher levels of anxiety may find threatening information more salient and worthy of attention (e.g., Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van Ijzendoorn, 2007; Cisler & Koster, 2010; Mogg & Bradley, 1998; Sylvester, Hudziak, Gaffrey, Barch, & Luby, 2016).

An anxiety-driven response to threat is known as threat bias (Sheppes, Luria, Fukuda, & Gross, 2013). High levels of anxiety can make it difficult to draw one's attention away from threatening stimuli to address relevant stimuli (Fox, Russo, Bowlea, & Dutton, 2001) and may result in overestimates of the likelihood of encountering fear-evoking objects. Aue, Hoeppli, Piguet, Sterpenich, and Vuilleumier (2013) researched snake or spider phobia and found that participants (N = 36) rated both spiders and snakes as threatening regardless of their specific phobia, but that participants were more likely to over-estimate the likelihood of encountering the animal that they feared. In another study of visually alarming stimulus, Laney, Campbell, Heuer and Reisberg (2004) established that memory enhances the emotionality of events, suggesting that general fear may enhance specific fears.

Multiple processes including focused attention, difficulties disengaging, and active avoidance may produce this attentional bias (Cisler & Koster, 2010). Levels of anxiety influence emotional reporting in reaction to threatening stimuli (Derakshan et al., 2007; Mogg, Philippot, & Bradley, 2004). This threat bias can lead to clinical symptoms; 75% of people diagnosed with a specific phobia report multiple phobias

(APA, 2013). Thus, people who respond with high levels of fear to one type of stimulus may demonstrate similar levels of fear for other stimuli. Taken together, if people who experience higher levels of anxiety are more fearful, and women experience higher rates of anxiety than men (McLean & Anderson, 2009), then women's broader anxieties may inform their specific fears regarding crime; and this may partially account for the gender paradox.

Gender Cognitive Theory as an explanation for differences. Human genetics might determine biological sex (being male or female) but everything that happens to ascribe whether we are boys or girls, men or women are a part of gender socialisation and the creation of gender schemas (Bem, 1981). Known as the Gender Cognitive Theory (Bussey & Bandura, 1999), this process may commence as soon as our caregivers are told "It's a boy!" or "It's a girl!". Although there is not enough space to discuss the history of the nature/nurture debate here, certainly the expressions and experiences I am refer to in this thesis align with gendered and socialised identities as opposed to biological determinations.

Gendered socialisation of emotional responses to threatening stimuli start early in our developmental trajectories and are informed by gender stereotypes (Plant, Hyde, Keltner, & Devine, 2000), where fearless men and fearful women are expected (Brody & Hall, 2010). In a classic example of gender stereotype activation in the developmental trajectory, Condry and Condry (1974) showed participants a video of a child dressed in gender-neutral clothing playing with a jack-in-the-box. When the jack sprung out of the box, the child in the video became startled. Participants who were told the child was a girl were more likely to describe "her" startle response as fear, and participants who were told the child was a boy were more likely to described "his" startle response as anger.

These different attributions of emotion towards men and women also happen in later life. For example, participants were shown images of faces and interpreted women's faces as more emotional than men's faces, except when these emotions work against stereotype (Plant, Kling, & Smith, 2004). This might be because there is an acknowledgment by participants that it is unusual for women to express anger or men to express sadness, so those expressing said emotions must be very angry (if a woman) or very sad (if a man). In another two studies that investigated emotional attribution using images of faces, Barrett and Bliss-Moreau (2009) showed participants (N = 46 and 48)

images of men's, women's, or androgynous faces expressing anger, sadness, disgust, or fear and an explanation for this emotion (such as "yelled at by the boss"). Despite an explanation for the emotional expression, participants still attributed emotion to disposition and personality when looking at women's faces but did not do this when looking at men's faces. Overall, this research suggests that differences in men's and women's self-reports are not only a function of reporting bias, but are informed by gender stereotypes, expectations, and interpersonal interactions.

Conclusion

Although the fear of crime gender paradox is often found, explanations for the paradox are not well tested. If men and women are socialised to respond to crime and threat differently, and people who are generally more fearful (or anxious) are likely to over-attend to threat, how researchers measure and define fear of crime is paramount, as well as how they measure fear. From the previous literature, it is not clear whether fear of crime is a unique response to crime, per se, or if fear of crime is a fear response to threat or is about fear at all. There are some proposed explanations for men's and women's diverse fear of crime responses, but these have not been experimentally tested.

To better understand what drives women's over-attendance and men's underattendance to criminal victimisation threat, researchers must try to tease apart the influences of threat and crime on men's and women's self-reports of fear. We must also extend this research to include men's and women's reactions to threat and crime: whether these be self-reports of emotional state or physiological reactions. Introducing methods to measure the role of potential covariates such as anxiety and impression management is essential. Developing an experimental paradigm is ideal to undertake this research, and the theoretical foundations of an experimental approach are discussed in *Chapter 3: Method*.

Chapter 3: Method

In this chapter I provide the rationale for the methods and measures used in the papers, discussing how such methods could assist us to better understand the fear of crime gender paradox. I then provide a brief overview of the design for each study (see Table 3.1), as well as explanations of why and how we measured specific demographic and control variables. I also report on descriptive and/or frequency statistics for demographic measures, and descriptive and comparative statistics of men's and women's scores against control variable measures. Further information, results, and discussion regarding the dependent and independent variables are found in the papers.

Experimental Design

Fear of crime research has focused on self-reported perceptions of safety, predicted risk of stranger violence, and predictions of attitude and behavioural responses to fear of crime (Warr, 2000). For ethical and practical reasons, there have been limited attempts to assess this fear in-situ; however, fear of crime may emerge over time and because of many micro-events (Solymosi, Bowers, & Fujiyama, 2015), so it would be helpful to ascertain these reactions.

This review of the fear of crime literature suggests that we are certainly measuring "something," and measuring it a lot (many times, in many places, and with many people), but we are not sure what this "something" is. An implicit theme within the Literature Review (*Chapter 2*) was that different methods have been used by criminologists (mainly large-scale community surveys such as Chadee, Ali, Burke, & Young's [2017] recent survey of 3,003 residents of Trinidad; Innes, 2017) and psychologists (mainly laboratory experiments such as Bianchin & Angrilli, 2012; Bradley, Codispoti, Sabatinelli, & Lang, 2001) to investigate responses to threat. Large-scale community surveys are generalisable back to those communities and allow exploration of how key variables may relate to each other. The limitation with such surveys is that they often contain many items related to a wide range of issues and so can only include a small number of fear of crime items. In-depth questioning is therefore not practical due to survey length and the number of constructs being evaluated. Such questions can also be inappropriate for ethical reasons.

The method used to gather more in-depth data has been to conduct interviews (e.g., Gilchrist, Bannister, Ditton, & Farrall, 1998; Farrall, 2004) or focus groups (e.g., Tulloch, 2003), however these methodologies may be problematic when exploring gender dynamics. The interaction between researcher and participant/s may reinforce gender stereotypes (Bryman, 1988), as might the retrieval of memories or hypothesising of how one would feel in certain circumstances (Robinson, Johnson, & Shields, 1998). This means measuring fear of crime as a projection of the future or reflection of the past is problematic (Hinkle, 2015; Hough, 2004; Jackson, 2009).

If we wish to measure an emotional reaction, then survey methods on people's door steps or over the phone are not the best method, particularly if the emotion we want to measure is fear. Emotion is best assessed in the moment, and the fear response is best measured in response to threatening stimuli (Garofalo, 1981; Kučera & Haviger, 2012). The presented stimulus also needs to be crime-related (and, as a control condition, not crime-related) to ascertain how crime may inform fear of crime reports. To propose another survey measure would not address these major limitations.

Experimental methods are helpful in determining the variables that influence certain responses (McGloin & Thomas, 2013) by garnering participants' responses to set stimuli, rather than relying on recollections of past fear reactions, or on predictions of potential future responses. Experimental studies have limitations, but they do allow us to tease apart the influence of specific variables (McGloin & Thomas, 2013). To investigate what drives people's fear responses, we turn to previous attempts to measure emotional reactions to threat. We can use laboratory and experimental methods common to phobia research to investigate actual fear, using threat cues to induce emotional responses (such as fear) in a safe and ethical manner.

In experimental paradigms, participants might view experimentally-manipulated stimuli while their responses are systematically measured. For example, images of threatening objects (often snakes and spiders) have been manipulated in various ways to examine how the evolutionary age of threatening objects (Blanchette, 2006; Brosch & Sharma, 2005), the effects of image presentation (Lin et al., 2009), the presence of other information (Tabibnia et al., 2008), or the degree to which an image is socially threatening, has influenced people's responses (Inagaki et al., 2012). In the laboratory, the recorded emotional reactions to threatening stimuli are complex and depend on the person (Hare, Frazelle, & Cox, 1978; Vitelli & Endler, 1993), the stimulus content (Miltner, Trippe, Krieschel, Gutberlet, Hecht, & Weiss, 2005), how the stimulus is presented (Carretie, Hinojosa, Lopez-Martin, Albert, Tapia, & Pozo, 2009), and when the response is measured (Garfinkel, Minati, Gray, Seth, Dolan, & Critchley, 2014).

Given that these small changes can alter participants' responses so significantly, the use of experimental methods in fear of crime research may allow us shed light on some of the questions posed in the Literature Review (*Chapter 2*). Despite the widespread use of images to assess threat responses, limited experimental work has incorporated images into investigations of crime-related threat or people's emotional responses to crime, nor how these responses relate to traditional fear of crime measures.

The use of images in research is not new and researchers have developed several sets of images to explore various emotional responses (e.g., the International Affective Picture System [IAPS], Lang, Bradley, & Cuthbert, 1999; the Geneva Affective PicturE Database [GAPED], Dan-Glauser & Scherer, 2011). These image sets contain hundreds of images that are rated according to valence (pleasant/unpleasant), arousal (calm/excited), and either dominance (controlled/in-control, the IAPS), or violation of norms (the GAPED). Attempts to categorise such images based on the types of emotions they elicit has mainly demonstrated the complexity of such a task (Bradley, Codispoti, Sabatinelli, et al. 2001; Mikels et al., 2005). Nonetheless, these image sets are used extensively in research, with over 1,000 researchers having permission to access the IAPS (Bradley & Lang, 2007) and over 230 citations to the IAPS and over 50 to the GAPED in 2017 alone (e.g., Kato & Takeda, 2017). The widespread use of these image sets highlights their utility in furthering our understanding of human emotions and responses.

Despite their utility, we cannot use the IAPS and GAPED to study fear of crime because there are too few crime-related images and no existing rating system to confirm whether these images are perceived as crime-related. Given the ambiguity of "crimerelatedness" as a theme, this is an important consideration. Researchers investigating threat dimensions have developed themed image sets to consider eyewitness memory of crime (in recalling the use of threatening and/or unusual weapons, Pickel, 1998); phobias (threatening objects that were modern or ancient; Blanchette, 2006; Brosch & Sharma, 2005); body-image (Dittmar, Halliwell, & Ive, 2006); direct and indirect threats (Kveraga et al., 2014) and public health campaigns (Leshner, Bolls, & Thomas, 2009). Similarly, brain-imaging studies have explored responses to images of knifewielding attackers (Biggs, Brockmole, & Witt, 2013) or threatening faces (McClure et al., 2003), but have not included traditional fear of crime measures, nor non-crimerelated but threatening images. Currently, no set of images reflects both threat and crime-relatedness, which is needed to explore fear of crime using this type of experimental paradigm.

Design of this Research

Given this research gap, a core task in devising *Paper 1* was to create, evaluate, and validate a set of images that were threatening and/or crime related. In the other papers we used quasi-experimental designs to explore the fear of crime gender paradox, as well as advanced psychometrically validated (*Paper 3*) or physiological methods (*Paper 4*). See Table 3.1 for a summary of the design for each paper.

Table 3.1

			Independent	t variables				Р	articipar	nts
Paper	Design	Threat (high vs. low)	Crime (high vs. low)	Gender (men vs. women)	Time (pre vs. post images)	Dependent variables	Control variables	Totals (N)	Men (n)	Women (n)
1, Study 1	Quasi- experimental on-line study with within- subjects factorial design	Within- subjects manipulat'n	Within- subjects manipulat'n	n/a	n/a	Threat ratings Crime ratings	Age Country of birth Country of residence State of residence Employment status Educational attainment Anxiety Social desirability	24#	4	20
1, Study 2	Quasi- experimental on-line study with within- subjects factorial design	Within- subjects manipulat'n	Within- subjects manipulat'n	n/a	n/a	Threat ratings Crime ratings	Fear of crime (crime worry) Perceptions of safety Stranger victimisation Policing Satisfaction	29#	6	23
1, Study 3	Quasi- experimental on-line study with within- subjects factorial design	Within- subjects manipulat'n	Within- subjects manipulat'n	n/a	n/a	Fear ratings Threat ratings Crime ratings		176#	81	95

Design Summary and Associated Variables and Participant Numbers for All Papers

(Cont.)

			Independent	t variables				Participants			
Paper	Design	Threat (high vs. low)	Crime (high vs. low)	Gender (men vs. women)	Time (pre vs. post images)	Dependent variables	Control variables	Totals (N)	Men (n)	Women (n)	
2	Quasi- experimental on-line study with mixed- factorial design	Within- subjects manipulat'n	Within- subjects manipulat'n	Self- identified between- subjects	n/a	Fear ratings	As per <i>Paper 1, Study</i> 3	As per F	Paper 1, 5	Study 3	
3	Quasi- experimental on-line study with mixed- factorial design	Between- subjects manipulat'n	Between- subjects manipulat'n	Self- identified between- subjects	Repeated measure/s	Positive affect Sadness Anger Fear Pleasure Satisfaction Control Arousal Sense of safety Qualitative response	As per <i>Papers 1 & 2</i> , and: Self-deceptive positivity Impression management Instrumentality Expressivity Masculinity Femininity	427	195	232	
4	Quasi- experimental laboratory study with mixed- factorial design	Within- subject manipulat'n	Within- subject manipulat'n	Self- identified between- subjects	n/a	Pleasantness Arousal Eye blinks Galvanic Skin Response (GSR)	As per <i>Paper 1</i> , <i>2</i> , and <i>3</i> , and: Sense of safety Heart rate Heart rate variability Respiratory rate Order condition	40	20	20	

Note. [#]All further reporting in this Chapter for *Paper 1* is only for the sample from Study 3 (N = 176).

Independent variables. We examined the influence of four independent variables: threat, crime, gender, and time.

Threat and crime. In all four papers we examined the influence of threat and crime on the dependent variables. We operationalised threat and crime through creating the Crime and Threat Image Set (CaTIS). The most exhaustive discussion of the CaTIS images, including the process of selection, evaluation, and validation is in *Paper 1* and the *Paper 1 Technical Appendix*.

Gender. In *Papers 2, 3,* and *4* we explored the fear of crime gender paradox by examining the influence of gender on the dependent variables. We operationalised gender by asking participants if they identified as a man or woman.

Time. In *Paper 2* we introduced the independent variable of time by measuring participant's emotional state (dependent variables) before being exposed to one of the four CaTIS image categories (pre) and after (post). A more extensive discussion is included in *Paper 2*.

Dependent Variables. In-depth information regarding dependent variables and the associated findings can be found in the relevant papers. The only exception is for the Positive and Negative Affect Schedule (PANAS), as space restrictions in *Paper 3* limited our ability to include this information in full. We include the information here.

PANAS. This measure has been widely adopted and adapted (Crawford & Henry, 2004; Watson, Clark, & Tellegen, 1988) due to its construct validity for both clinical and non-clinical samples. Given it's many adaptions, two versions were integrated into *Paper 2*. The first version was the PANAS Modified from Hepler and Albarracin (2013). We selected this version as it expanded upon Watson et al.'s (1988) highly-cited version to include high frequency emotions. The Hepler and Albarracin (2013) version contains 40 items participants rate on a Likert scale from 1 (*not at all*) to 7 (*extremely*) from which we calculated 2 scores: positive affect (19 items) and negative affect (21 items). These scores are negatively correlated and sensitive to mood induction techniques (Egloff, 1998). The second version we used was the PANAS–Expanded Version–Short Form (Salas, Radovic, & Turnbull,2012). This is an assessment of the basic emotions of joy, sadness, anger, and fear. It contains 12 items (3 for each basic emotion category) with a Likert scale responses from 1 (*not at all*) to 5 (*extremely*). We selected this version as it allowed us to calculate scores associated with different primary emotions, including fear. To minimise participant fatigue, we combined the

scales. The resulting scale had 45 items in total: 33 items found only in Hepler and Albarracin (2013), 5 items found only in Salas, Radovic and Turnbull (2012), and 7 items found in both scales. We used the Likert scale from 1 (*not at all*) to 7 (*extremely*) for consistency. Wording was altered to better meet the research need. For example, "*In general (on average), I feel...*" was altered to "*I currently feel...*" This was to gather data on how participants were experiencing emotion in the present.

Control variables. We did not include detailed information pertaining to the control variables in each paper, so instead provide more extensive detail regarding the control variables (i.e., demographic variables, anxiety, impression management, gender identity, fear of stranger victimisation, experiences of victimisation, and policing satisfaction) here.

Demographics. We measured relevant and non-identifiable demographic details in each study. This was so we could understand the general profile of our participants to contextualise our findings.

Age. In each study, participants provided their age in years. See Table 3.2 for descriptive statistics.

Table 3.2

Total				Men			Women			
Paper	Ν	М	SD	n	М	SD	n	ı	М	SD
1 & 2	176	31.48	10.56	81	30.51	9.04	9	5	32.61	11.72
3	427	33.08	10.65	195	32.93	10.65	23	32	33.36	10.40
4	40	28.95	10.92	20	29.80	9.62	2	0	29.00	12.10

Descriptive Statistics of Participants' Age (in Years)

Country of birth. In each study, participants provided their country of birth. This information was then summarised this into two categorical variables: being born in Australia, or outside of Australia. Most participants in each study were born in Australia. See Table 3.3 for the proportion of participants in each category, with the majority group for each category highlighted in bold. We did not include questions pertaining to participant racial heritage, as this may have allowed participants to be individually identified.

Table 3.3

		Totals (%)		Men (%	ó)		Women (%)				
Paper	Ν	Australia	Country other than Australia	n	Australia	Country other than Australia	п	Australia	Country other than Australia			
1&2	176	150 (85.23%)	26 (14.77%)	81	66 (81.48%)	15 (18.52%)	95	84 (88.42%)	11 (11.58%)			
3	425	352 (82.82%)	73 (17.18%)	194	149 (76.80%)	45 (23.20%)	231	203 (87.88%)	28 (12.12%)			
4	40	21 (52.50%)	19 (47.50%)	20	12 (60.00%)	8 (40.00%)	20	9 (45.00%)	11 (55.00%)			
Totals	641	523 (81.59%)	118 (18.41%)	295	227 (76.95%)	68 (23.05%)	346	296 (85.55%)	50 (14.45%)			

Summary of Participants' Country of Birth

Note. Percentages are per sample or sub-sample (i.e., proportion of men, proportion of women).

Country of residence. In each study, participants provided their country of residence at the time of participation. This information was then summarised into two categorical variables: living in Australia or living outside of Australia. Most participants in each study lived in Australia. See Table 3.4 for the proportion of participants in each category, with the majority group for each category highlighted in bold.

Table 3.4

		Totals (%	ó)		Men (%))	Women (%)				
Paper	Ν	Australia	Country other than Australia	n	Australia	Country other than Australia	n	Australia	Country other than Australia		
1 & 2	176	171 (97.16%)	5 (2.84%)	81	80 (98.77%)	1 (1.23%)	95	91 (95.79%)	4 (4.21%)		
3	426	411 (96.48%)	15 (3.52%)	194	189 (97.42%)	5 (2.58%)	232	222 (95.69%)	10 (4.31%)		
4	40	39 (97.50%)	1 (2.50%)	20	19 (95.00%)	1 (5.00%)	20	20 (100.00%)	0 (0.00%)		
Totals	642	621 (96.73%)	21 (3.27%)	295	288 (97.63%)	7 (2.37%)	347	333 (95.97%)	14 (4.03%)		

Summary of Whether Participants' Lived in Australia or Otherwise

Note. Percentages are per sample or sub-sample (i.e., proportion of men, proportion of women).

State of residence. In each study, participants provided their current postcode at the time of participation. This information was then aligned with State and Territory postcodes. Almost half of all participants came from Victoria. See Table 3.5 for the proportion of participants in each category, with the majority group for each category highlighted in bold. There are small discrepancies between the information provided for country of residence and place of residence based on this postcode data. For example, 4 of the 15 participants in *Paper 3* stated they lived overseas but then provided Australian postcodes. This could be due to a clerical error or a misinterpretation of the question.

Table 3.5

Paper	Ν	ACT	NSW	NT	Qld	SA	Tas	WA	Vic	Outside Australia	Un-specified
1 & 2											
Totals	176	1 (0.57%)	48 (27.27%)	4 (2.27%)	27 (15.34%)	7 (3.98%)	1 (0.57%)	6 (3.41%)	79 (44.89%)	0 (0.00%)	3 (1.70%)
Men	81	0 (0.00%)	22 (27.16%)	3 (3.70%)	11 (13.58%)	3 (3.70%)	0 (0.00%)	2 (2.47%)	38 (46.91%)	0 (0.00%)	2 (2.47%)
Women	95	1 (1.05%)	26 (27.37%)	1 (1.05%)	16 (16.84%)	4 (4.21%)	1 (1.05%)	4 (4.21%)	41 (43.16%)	0 (0.00%)	1 (1.05%)
3											
Totals	427	7 (1.64%)	100 (23.42%)	0 (0.00%)	56 (13.11%)	25 (5.85%)	5 (1.17%)	25 (5.85%)	198 (46.37%)	5 (1.17%)	6 (1.41%)
Men	195	5 (2.56%)	41 (21.03%)	0 (0.00%)	26 (13.33%)	9 (4.62%)	0 (0.00%)	11 (5.64%)	97 (49.74%)	2 (1.03%)	4 (2.06%)
Women	232	2 (0.86%)	59 (25.43%)	0 (0.00%)	30 (12.93%)	16 (6.90%)	5 (2.16%)	14 (6.03%)	101 (43.53%)	3 (1.29%)	2 (0.86%)
4											
Totals	40	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	40 (100.00%)	0 (0.00%)	0 (0.00%)
Men	20	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	20 (100.00%)	0 (0.00%)	0 (0.00%)
Women	20	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	20 (100.00%)	0 (0.00%)	0 (0.00%)
Totals	643	8 (1.24%)	148 (23.02%)	4 (0.62%)	83 (12.91%)	32 (4.98%)	6 (0.93%)	31 (4.82%)	317 (49.30%)	5 (0.78%)	9 (1.40%)

Number (and Percentage) of Participants' Stating Their Postcode Was Associated with One of the Following States or Territories in Australia

Note. Abbreviations are as follows: Australian Capital Territory (ACT), New South Wales (NSW), Northern Territory (NT), Queensland (Qld), South Australia (SA), Tasmania (Tas), Western Australia (WA), and Victoria (Vic). Percentages are per sample or sub-sample (i.e., proportion of men, proportion of women).

Employment status. In each study, participants indicated whether they were employed part-time, full-time, or not employed. See Table 3.6 for the proportion of participants in each category, with the majority group/s for each category highlighted in bold.

Table 3	.6
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		Т	otals (%)		Men (%)					Women (%)				
Paper	Ν	None	Part-time	Full-time	Ν	None	Part-time	Full-time	Ν	None	Part-time	Full-time		
1&2	175	51 (29.14%)	62 (35.43%)	62 (35.43%)	80	23 (28.75%)	24 (30.00%)	33 (41.25%)	95	28 (29.47%)	38 (40.00%)	29 (30.53%)		
3	426	111 (26.06%)	146 (34.27%)	169 (39.67%)	194	48 (24.74%)	64 (32.99%)	82 (42.27%)	232	63 (27.16%)	82 (35.34%)	87 (37.50%)		
4	40	21 (55.00%)	18 (40.00%)	1 (5.00%)	20	13 (65.00%)	5 (25.00%)	2 (10.00%)	20	9 (45.00%)	11 (55.00%)	0 (0.00%)		
Totals	641	184 (28.71%)	224 (34.95%)	233 (36.35%)	294	84 (28.57%)	93 (31.63%)	117 (39.80%)	347	100 (28.82%)	131 (37.75%)	116 (33.43%)		

Participants' employment status at time of completing the survey

Note. Percentages are per sample or sub-sample (i.e., proportion of men, proportion of women).

Educational attainment. In each study, participants indicated their level of education by selecting one of six options. See Table 3.7 for the options and the proportion of participants in each category, with the majority group for each category highlighted in bold.

Table 3.7

Paper	Ν	No formal education	Completed secondary school	Completed trade qualification	Completed TAFE or Diploma level	Completed tertiary/University undergraduate degree	Completed postgraduate degree
1 & 2							
Totals	176	4 (2.27%)	76 (43.18%)	3 (1.70%)	63 (35.80%)	23 (13.07%)	7 (3.98%)
Men	81	2 (2.47%)	38 (46.91%)	2 (2.47%)	28 (34.57%)	8 (9.88%)	3 (3.70%)
Women	95	2 (2.11%)	38 (40.00%)	1 (1.05%)	35 (36.84%)	15 (15.79%)	4 (4.21%)
3							
Totals	424	6 (1.42%)	168 (39.62%)	13 (3.07%)	179 (42.22%)	45 (10.61%)	13 (3.07%)
Men	194	1 (0.52%)	81 (41.75%)	11 (5.67%)	76 (39.18%)	17 (8.76%)	8 (4.12%)
Women	230	5 (2.17%)	87 (37.83%)	2 (0.86%)	103 (44.78%)	28 (12.17%)	5 (2.17%)
4							
Totals	40	0 (0.00%)	16 (40.00%)	1 (2.50%)	7 (17.50%)	14 (35.00%)	2 (5.00%)
Men	20	0 (0.00%)	7 (35.00%)	0 (0.00%)	2 (10.00%)	9 (45.00%)	2 (10.00%)
Women	20	0 (0.00%)	9 (45.00%)	1 (5.00%)	5 (25.00%)	5 (25.00%)	0 (0.00%)
Total	640	10 (1.56%)	260 (40.62%)	17 (2.66%)	249 (38.91%)	82 (12.81%)	22 (3.44%)

Participants' Highest Level of Educational Attainment

Note. Percentages are per sample or sub-sample (i.e., proportion of men, proportion of women).

Anxiety. The Severity Measure for Generalised Anxiety Disorder – Adult is a 10-item clinical measure of anxiety levels (APA, 2013). In each study participants completed this measure by considering the previous week and indicating whether a thought, feeling, or behaviour (e.g., avoidance) associated with anxiety had been present 0 (*never*), 1 (*occasionally*), 2 (*half the time*), 3 (*most of the time*), or 4 (*all the time*). We then calculated the mean to determine levels of anxiety as none (0), mild (1), moderate (2), severe (3), and extreme (4) for each participant. We selected this measure as it was published with the new DSM-V (2013) and is a recommended measure of clinically-defined generalised anxiety.

Across the first two studies (*Paper 1, 2,* and *3*), on average participants had no to mild levels of anxiety. In the third study (*Paper 4*), on average participants reported clinical levels of anxiety in the moderate range. Only two participants (from *Paper 3*) across all studies reported an extreme level of anxiety, with most participants reporting none to mild levels. There were no significant differences between men's and women's anxiety reports, as determined by *t*-tests. See Table 3.8 for descriptive and comparative statistics.

Table 3.8

Descriptive Statistics and t-tests for Participants' Anxiety Scores	

Paper	Cronbach α co-efficient	Totals			Men				Wome	n	<i>t</i> -test values for men's vs. women's scores		
		Ν	М	SD	n	М	SD	n	М	SD	t	р	
1&2	$.90^{\#}$	176	0.96	0.69	81	0.92	0.63	95	1.00	0.74	0.83	.41	
3	$.90^{\#}$	427	0.96	0.75	195	0.92	0.71	232	0.99	0.77	0.87	.39	
4	$.88^{\#}$	40	2.02	0.74	20	2.01	0.75	20	2.03	0.75	0.09	.93	

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Impression management. We used two different measures of social desirability and impression management.

Social desirability bias. The Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds, 2006) is widely used in empirical research to measure the extent of socially desirable reporting (e.g., Francis, Dugas, & Ricard, 2016). In each study, participants indicated whether 13 separate items (e.g., "I am sometimes irritated by people who ask favours of me") were *true* (0) or *false* (1). Five items (e.g., "No matter who I am talking to, I'm always a good listener") were reverse scored. The scale has a possible range of 0–13, with a higher score indicating greater proclivity to respond in a socially desirable manner. We ran *t*-tests which revealed no significant differences between men's and women's reports of social desirability bias in *Paper 1 & 2* or *Paper 4*, but we did find a significant difference between men's and women's social desirability scores in *Paper 3*, with women reporting greater social desirability bias than men. See Table 3.9 for descriptive and comparative statistics.

Table 3.9

Descriptive Statistics and t-tests for Participants' Social Desirability Scores

	Cronbach α	Totals				Men			Wome	n	<i>t</i> -test values for men's vs. women's scores		
Paper	aper co-efficient	Ν	М	SD	n	М	SD	n	М	SD	t	р	
1&2	.72#	176	4.96	1.96	81	4.87	2.06	95	5.06	1.87	0.63	.53	
3	.66	427	6.56	2.76	195	6.19	2.69	232	6.88	2.78	2.60	.01**	
4	.19	40	6.78	2.56	20	7.10	2.95	20	6.45	2.11	-0.80	.43	

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Desirable responding. The Balanced Inventory of Desirable Responding (BIDR, Paulhus, 1988 in Paulhus & Reid, 1991) is a measure of self-deceptive positivity and impression management (Reynolds, 2006). It is less widely used than the Marlowe-Crowne; however, "emphasises exaggerated claims of positive cognitive attitudes (overconfidence in one's judgements and rationality)" (Ciarrochi & Bilich, 2006, p.41). The BIDR has 40 items (e.g., "I have never dropped litter on the street") across two subscales (self-deceptive positivity and impression management) of 20 items each. Participants in *Papers 3* and *4* rated these items on a Likert scale from 1 (*not true*) to 7 (*very true*). After half of the items were reverse scored, ratings 1 to 5 were recoded as 0, and ratings of 6 or 7 were recoded as 1. For each sub-scale, there is a possible range of 0–20; with higher scores indicated greater self-deceptive positivity or impression management. We conducted *t*-tests and found no statistically significant differences in men's and women's self-deceptive positivity for either paper, but women did indicate significantly greater impression management propensity than men in *Paper 3*, but not *Paper 4*. See Table 3.10 for descriptive and comparative statistics.

Table 3.10

	Cronbach α co-efficient	Totals			Men			Women			<i>t</i> -test values for men's vs. women's scores	
Paper		N	М	SD	n	М	SD	n	М	SD	t	р
3												
Self-deceptive positivity	.73#	427	4.88	3.40	195	5.08	3.54	232	4.71	3.27	-1.12	.26
Impression management	.79#	427	5.67	3.87	195	5.02	3.62	232	6.22	3.99	3.27	<.01**
4												
Self-deceptive positivity	.68	40	4.08	2.93	20	4.00	2.56	20	4.15	3.34	0.15	.87
Impression management	.74#	40	6.60	3.67	20	6.40	3.41	20	6.80	4.00	0.34	.74

Descriptive Statistics of Participants' Self-deceptive Positivity and Impression Management Scores

Note. * $p \le .05$, ** $p \le .01$. *sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Gender Identity Scales. Gender ascriptions and identities are not always binary or linked to biological sex, as gender is a complex construct linked to socialisation (McPhail, 2008). For this reason, we included two measures of gender identity in *Paper 3* and *4*.

Sex role identity. The Sex Role Identity Scale (SRIS; Storms, 1979) includes six items across two sub-scales where participants can indicate how masculine and feminine they perceive themselves to be (e.g., "How masculine is your personality?"). Participants select a response on a Likert scale from 1 (*Not at All*) to 31 (*Extremely*). We selected this scale to measure gender (which is a non-binary construct) as distinct from biological sex (male, female, intersex). There were significant negative correlations between participants' masculinity and femininity scores in *Paper 3*, *r* (427) = -.69, p < .01, and in *Paper 4*, *r* (40) = -.69, p < .01. Predictably, men in both samples rated themselves as significantly more masculine than women did, and women in both samples rated themselves as significantly more feminine than men did. See Table 3.11 for descriptive and comparative statistics.
Table 3.11

	Cronbach α	Cronbach a Totals				Men			Wome	n	<i>t</i> -test value vs. wome	<i>t</i> -test values for men's vs. women's scores	
Paper	co-efficient	Ν	М	SD	n	М	SD	n	М	SD	t	р	
3													
Masculine	.95#	427	45.77	21.88	195	58.84	15.26	232	34.79	20.55	-13.51	<.01**	
Feminine	.96#	427	45.08	23.08	195	27.79	16.22	232	59.60	17.24	19.51	<.01**	
4	_												
Masculine	.96#	40	45.63	21.51	20	61.60	10.48	20	29.65	17.42	-7.03	<.01**	
Feminine	.97#	40	46.55	24.24	20	28.35	18.33	20	64.75	13.15	7.22	<.01**	

Descriptive Statistics and t-tests for Participants' Masculine and Feminine Scores on the Sex Role Identity Scale

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Gendered attributes. We used the Personal Attributes Questionnaire (PAQ, Spence, Helmreich & Stapp, 1975) to measure the sub-scales of instrumentality (masculinity) and expressivity (femininity). There was a third sub-scale (androgyny) but it was not relevant to this research so we do not calculate it here. This version of the scale included 24 items (12 items per sub-scale) with 2 differentiated response categories and 5 points (e.g., Item 1 is "Not at all aggressive" / "Very aggressive"). We selected the PAQ as it allowed participants to provide more implicit assessments of their (stereotypically) feminine and masculine characteristics, and because it is preferred over Bem's measure (e.g., Beere, 1990). For the 2 sub-scales there was a possible range of 12-60; with higher scores indicated greater instrumentality or expressivity. For Paper 3, there was a low significant positive correlation between expressivity and instrumentality, r(427) = .21, p < .01. For *Paper 4*, there was no significant correlation between expressivity and instrumentality, r(40) = .09, p = .58. We ran *t*-tests and found that women in *Paper 3* scored significantly higher in expressivity than men, but women's and men's scores in Paper 4 were comparable. Men and women in either study did not score significantly differently on the instrumentality sub-scale. See Table 3.12 for descriptive and comparative statistics.

Table 3.12

Descriptive Statistics and t-tests for Participants' Instrumentality & Expressivity Scores on the Personal Attributes Questionnaire

	Cronbach α	Cronbach a Totals				Men			Womer	1	<i>t</i> -test value wome	<i>t</i> -test values for men's vs. women's scores	
Paper	co-efficient	N	М	SD	n	М	SD	n	М	SD	t	р	
3													
Instrumentality	.76#	427	27.73	5.19	195	27.82	5.56	232	27.65	4.87	33	.75	
Expressivity	.79#	427	31.54	4.59	195	30.34	4.70	232	32.55	4.25	5.10	<.01**	
4													
Instrumentality	.75#	40	26.20	4.87	20	26.15	4.56	20	26.25	5.29	.06	.95	
Expressivity	.71#	40	31.85	3.70	20	32.30	4.23	20	31.40	3.14	77	.45	

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Fear of Stranger Victimisation

We included three measures of fear of stranger victimisation. Some information is available here, with further relevant detail available in the associated papers.

Fear of crime and crime worry. Jackson's (2006) 20-item Fear of Crime Measure is validated and widely used (e.g., Chataway & Hart, 2016). It includes four sub-scales (crime worry, likelihood estimates, perceived effect on life, level of perceived control) of which crime worry was our focus. We included more information on this measure and the crime-worry subscale in the papers, as well as relevant group comparisons. See Table 3.13 for an overview of descriptive statistics.

Table 3.13

	Cronbach	Totals				Men		Women			
Paper	co- efficient	Ν	М	SD	п	М	SD	п	М	SD	
1 & 2											
Fear of crime	.72#	175	3.39	0.69	81	3.12	0.61	94	3.63	0.67	
Crime worry	.79#	175	1.98	1.04	81	1.88	0.96	94	2.07	1.11	
3											
Fear of crime	.82#	427	2.98	0.70	195	2.87	0.65	232	3.08	0.69	
Crime worry	.83#	426	1.49	0.53	195	1.39	0.46	231	1.56	0.57	
4											
Fear of crime	.82#	40	2.97	0.63	20	2.84	0.64	20	3.11	0.60	
Crime worry	.74#	40	1.52	0.48	20	1.23	0.22	20	1.71	0.52	

Descriptive Statistics for Participants' Fear of Crime Scores and Crime Worry Sub-Scale Scores

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Perceptions of safety. We used a measure implemented by the Australian Government as part of biannual Report of Government Services. Although not a standardised measure, we used this measure because the Australian Government uses it to evaluate the effectiveness of justice services (ABS, 2014a). We included more information on this measure in the papers, as well as relevant group comparisons. See Table 3.14 for an overview of descriptive statistics.

Table 3.14

	Cronbach α		Totals				Men			Women			
Paper	co-efficient	N	М	SD		п	М	SD	-	n	М	SD	
1 & 2	.79#	176	3.66	0.62		81	3.85	0.60		95	3.49	0.59	
3	.76#	427	3.59	0.72		195	3.84	0.65		232	3.36	0.66	
4	$.70^{\#}$	40	3.67	0.66		20	3.92	0.62		20	3.43	0.61	

Descriptive Statistics for Participants' Perceptions of Safety Scores

Note. * $p \le .05$, ** $p \le .01$. *sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Perceived threat and safety. This is a brief measure implemented by Carlton-Ford, Ender, and Tabatabal (2008) to assess perceived safety regarding five domains: self, family, neighbourhood, city and country. The original version listed Baghdad and Iraq as city and country, however these were altered for generality (to *city* and *country*). There are five items where participants rated their perceived safety on a Likert scale from 1 (*poor*) to 4 (*excellent*), with a higher score indicating greater safety (hereafter referred to as perceived safety) within a possible range of 1–4. It differed from the other fear of crime measures as it did not include the term crime, and this meant we could administer it both before and after the images without potentially priming our participants. See *Paper 3* for more information on this measure and associated findings.

Experiences of Victimisation. We developed a 10-item measure of stranger victimisation to determine whether participants had experienced the same 5 crimes events included in Jackson's (2006) fear of crime measure (being attacked by a stranger in the street; being robbed or mugged in the street; being harassed, threatened or verbally abused in the street; having someone break into your home whilst the inhabitants were there; and, having someone break into your home whilst the inhabitants were away). We used these crime events for consistency with Jackson's (2006) validated measure and to minimise participant fatigue. Participants indicated they had experienced these events either 0 (never), 1 (once), or 2 (more than once) in "the last 12 months" or "ever" in their lives. We then averaged responses to derive a final score within the possible range of 0–2. A higher score indicated more victimisation experiences. As men typically experience higher rates of stranger victimisation (Heimer & Lauritsen, 2008), we could expect that they would report higher rates of victimisation on this scale, however we only found this in *Paper 3*. Further research with a new scale would assist in discerning these links. See Table 3.15 for descriptive and comparative statistics.

Table 3.15

	Cronbach α	Totals		5	Men				Wome	n	<i>t</i> -test val vs. won	<i>t</i> -test values for men's vs. women's scores	
Paper	co-efficient	Ν	М	SD	n	М	SD	n	М	SD	t	р	
1&2	.62	176	0.29	0.25	81	0.33	0.26	94	0.26	0.24	-1.86	.07	
3	.67	427	1.29	0.26	195	1.33	0.29	232	1.26	0.22	-3.16	<.01**	
4	.68	40	1.29	0.27	20	1.23	0.22	20	1.35	0.30	1.44	.16	

Descriptive Statistics and t-tests for Participants' Victimisation Scores

Note. * $p \le .05$, ** $p \le .01$. [#]sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

Policing Satisfaction. Because some of the CaTIS images included pictures of police, we wanted to measure policing satisfaction as a potential co-variate. Governments also use fear of crime as a key performance indicator for policing services and we thought this may necessitate us exploring this link. The measure we used is part of Australian Governments' Report on Government Services (ABS, 2014a) to assess participants' level of satisfaction with policing services. Participants' scores can fall within the possible range of 1–5 and a higher score indicates greater belief in police integrity and greater satisfaction with policing services. See *Paper 2* for further information. We conducted *t*-tests and found that men and women did not differ in their reported satisfaction with police in *Paper 3* or *4*, but that women reported greater policing satisfaction in *Papers 1 & 2* (which used the same data set). See Table 3.16 for an overview of descriptive and comparative statistics.

Table 3.16

	Cronbach α	Cronbach α		Fotals		Men			Wome	n	<i>t</i> -test valu wom	<i>t</i> -test values for men's vs. women's scores		
Paper	co-efficient	Ν	М	SD	n	М	SD	n	М	SD	t	р		
1 & 2	.87#	176	3.56	0.97	81	3.41	1.07	94	3.71	0.81	2.06	.04*		
3	.85#	426	3.18	0.94	194	3.18	0.94	232	3.19	0.94	0.08	.93		
4	.67#	40	3.49	0.82	20	3.59	0.88	20	3.40	0.75	-0.72	.47		

Descriptive Statistics and t-tests for Participants' Policing Satisfaction Scores

Note. * $p \le .05$, ** $p \le .01$. #sufficient internal consistency (recommended $\alpha > .70$; DeVellis, 2012).

In this chapter I have outlined how experimental design could assist us in exploring the fear of crime gender paradox. I then outlined the study designs before providing further statistical detail for demographic and control variables that we measured but did not include in the papers.

Chapter 4: Paper 1

The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime

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Please note that I have made small alterations to this Paper for thesis presentation. These changes were limited to the formatting of margins, line spacing, placement of tables and figures, numbering of tables and figures, removing all reference lists (which are compiled at the end of the thesis), and altering some in-text citations to align with this compiled list. As no other changes were made, the referencing style and language requested by the *Journal of Experimental Criminology* were retained.

Abstract

Objectives

Fear of crime may develop in response to crime specifically (the narrow pathway) or may be a projection of broader threats (the broad pathway). New approaches are needed to examine how crime and threat, independently and in combination, influence people's fear. To address this need, we created, evaluated, and validated an image set that varied across the dimensions of threat and crime.

Method

We used a 2 (Threat: high vs. low) x 2 (Crime: high vs. low) within-subjects factorial design. In three studies, participants (Ns = 24, 29, and 176) gave threat, crime, and fear ratings towards images. Participants also completed two traditional fear of crime measures and a measure of anxiety. Two evaluation studies explored the suitability of 178 images to produce a final set of 80 images (20 in each of the 4 categories). We validated this final set of 80 images in a third study.

Results

The validated Crime and Threat Image Set (CaTIS) contains 78 images across 4 categories: threat-and-crime (high-crime, high-threat), threat-only (low-crime, high-threat), crime-only (high-crime, low-threat), and neutral (low-crime, low-threat). There were significant main effects of threat and crime, and an interaction between Threat x Crime, on participants' fear ratings. Participants' own ratings of threat—but not crime—had a strong relationship with their fear ratings.

Conclusions

Threat had a stronger influence on participants' fear ratings than crime. Thus, what is typically referred to as fear of crime may reflect broader fear. Further research with the CaTIS could explore the expression of this fear.

The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime

Criminologists are intrigued by community members' fear of crime (Fisher 2016; Hale 1996; Warr 2000). Fear of crime contributes to poor physical and mental health (Jackson & Stafford 2009; Klama & Egan 2011; Stafford Chandola & Marmot 2007) and is economically costly (Dolan & Peasgood 2007). Given this, governments would benefit from addressing drivers of fear of crime as well as focusing on reducing crime rates (Borooah & Carcach 1997; Grabosky 1995; Warr 2000). Traditional approaches to measuring fear of crime rely on surveys that give a snapshot of people's fear about their overall safety and worries about crime (e.g., Jackson, 2006); however, more fine-grained, novel approaches may be able to pinpoint the drivers of people's fear.

Two Alternative Pathways to Fear of Crime

Fear of crime may develop along two competing pathways (e.g., Farrall Jackson & Gray 2009; Ferraro 1995; Hirtenlehner & Farrall 2013). For the narrow pathway, fear of crime is a concrete and episodic response to cues about community disorganization. For the broad pathway, fear of crime is not a direct response but a projection of "free-floating, amorphous anxieties about modernization" (Hirtenlehner & Farrall 2013, p. 5). In the broad pathway, people feel anxiety about the world (as opposed to discomfort about their direct environment) and then express this anxiety as a fear of crime because it makes sense to fear a stranger attacking you (Hough 2009).

If the narrow pathway applies then fear should be particularly high in situations where crime-related community disorganization is apparent. If the broad pathway applies then fear could be projected onto different threatening stimuli irrespective of crime-relatedness. Hirtenlehner and Farrall (2013) modelled the two pathways and found more support for the broad pathway with "fear of crime [emerging as] a manifestation of more general fears" (p. 18). Building on their work, we aimed to develop a novel set of stimuli that would allow us to experimentally examine the independent and interactive effects of threat and crime on people's fear ratings. This included comparing crime-related threat to non-crime-related threat.

Experimental Research Using Images

To investigate fear, we turn to previous attempts to measure emotional reactions to threatening stimuli. Experimental designs common to phobia research can be used to explore fear because threat cues can be used to safely induce emotional responses. In these paradigms, researchers present experimentally-manipulated images of threatening objects (often snakes and spiders) to participants and systematically measure the participants' responses (e.g., Blanchette 2006; Brosch & Sharma 2005; Tabibnia et al. 2008).

Despite the widespread use of images to assess threat responses, minimal experimental work has used images to investigate people's emotional responses to crime (cf., Yang & Pao 2015; Ziegler & Mitchell 2005). The existing image sets that include threatening images (e.g., the International Affective Picture System [IAPS], Lang et al. 1999; the Geneva Affective PicturE Database [GAPED], Dan-Glauser & Scherer 2011), do not include independent dimensions of threat and crime-relatedness. This is needed to explore fear of crime using experimental methods.

Current Research

The first aim of this research was to develop a Crime and Threat Image Set (CaTIS) following the general principles of scale construction and validation (e.g., DeVellis 2012). We selected images that we perceived to align with the constructs of threat (high vs. low) and crime (high vs. low) to reflect four categories: threat-and-crime, threat-only, crime-only, and neutral. Rather than relying only on our own researcher classifications of these images, we compared our classifications with participants' ratings to confirm the CaTIS classifications. Across three studies, we evaluated and validated the images to ensure that the variable labels were accurate and reliable and, thus, useful for further research.

The second aim of this research was to examine how these image categories of threat and crime influenced participants' rating of their fear as they viewed the CaTIS images. Previous criminological research has considered fear of crime and fear of crime and threat (see Hirtenlehner and Farrall 2013 for a summary). There is also psychological research that contributes to our understanding of fear as a response to threat (e.g., Blanchette 2006; Brosch & Sharma 2005; Tabibnia et al. 2008), but this research does not include the variable of crime. We wanted to experimentally explore whether threat, crime, or both influence fear ratings. The third aim of this research was to explore how experiences of anxiety relate to fear.

Study 1: Image Evaluation

In Study 1, we assessed whether our threat and crime classifications of a larger set of images (N = 129) corresponded with participants' ratings of threat and crime. The goal was to refine the larger collection of images to a set of 80 images (20 images in each of the 4 categories) with our classifications and participants' ratings aligning for each image (i.e., perfect inter-rater reliability).

Method

Participants. Participants (N = 24) were recruited using a convenience sampling technique. We recruited first-year criminology and psychology students from an Australian university who participated in exchange for course credit. Participants ranged in age from 19 to 54 years (M = 34.50, SD = 11.07), and 83% self-identified as female.

Design. We used a 2 (Threat: high vs. low) x 2 (Crime: high vs. low) withinsubjects factorial design. The threat manipulation refers to whether we (the researchers) classified an image as threatening or not, and the crime manipulation refers to whether we classified an image as crime-related or not.

Materials.

Images. We searched for internet-based images using the strategy outlined in the Technical Appendix. We compiled 129 images that we judged represented one of the four categories: threat-and-crime, threat-only, crime-only, and neutral.

Measures. Five statements were presented under each image using a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Three statements were relevant to the current study: "This is threatening to most people" (referred to hereafter as the threat rating), "This makes me think of crime" (referred to hereafter as the crime rating), and "This scares me" (referred to hereafter as the fear rating). See the Technical Appendix for further information on the other statements.

We piloted the functionality of several other measures that we report in Study 3. These were Jackson's (2006) Fear of Crime Measure (referred to hereafter as fear of crime) and its Crime Worry sub-scale (referred to hereafter as crime worry), the Australian Bureau of Statistics (ABS 2014a) Perceptions of Safety Measure (referred to hereafter as perceptions of safety), and the Severity Measure for Generalised Anxiety Disorder (GAD) – Adult (referred to hereafter as anxiety; American Psychiatric Association [APA] 2013). We also included other measures for an unrelated research question. Information regarding these measures can be found in the Technical Appendix.

Procedure. We explain all relevant components here, with the full procedure found in the Technical Appendix. The online study was presented using Qualtrics software (http://www.qualtrics.com). Participants provided informed consent, answered demographic questions, and completed the anxiety measure. Participants were then informed that they would view images and be asked to provide ratings for each image. Instructions encouraged participants to be spontaneous and not to think too much about their ratings. Images were displayed individually with a screen resolution of 480 x 640 pixels, presented in random order, and remained on the screen until the participant advanced to the next page. After rating all images, participants completed the perceptions of safety and fear of crime measures. Participants were debriefed and thanked for their time. The study took approximately 90 minutes to complete.

Results and Discussion

Participants' ratings and researcher classifications aligned for 24 of the 42 threat-and-crime images, 10 of the 34 threat-only images, 8 of the 27 crime-only images, and 26 of the 26 neutral images. See the Technical Appendix for further information. As we fell short of our 20-image goal for the threat-only and crime-only categories, we conducted an additional image evaluation study (Study 2).

Study 2: Image Evaluation

We conducted Study 2 with a different sample of participants to find further images in the threat-only and crime-only categories. Our goal was to find images where our researcher classifications aligned with participants' ratings. We used the same method as in Study 1 and only report exceptions.

Method

Participants. Participants (N = 29) ranged in age from 18 to 59 years (M = 39.69, SD = 11.30), and 79% self-identified as female.

Materials.

Images. A total of 49 additional images were sourced through a second Internet search. Informed by participants' ratings in the first study, we selected 49 images that we expected to align with the threat-only and crime-only categories. We did not include threat-and-crime nor neutral images because Study 1 produced a set of 20 for both categories.

Procedure. It took participants approximately 60 minutes to complete the study. **Results and Discussion**

Participants' ratings and researcher classifications aligned for 25 of the 29 threat images, and 11 of the 20 crime-only images. More information regarding the final selection process can be found in the Technical Appendix.

In combination, Study 1 and Study 2 produced the CaTIS, with 20 images in each of the categories: threat-and-crime, threat-only, crime-only, and neutral. See Figure 4.1 for sample images in each category. The complete set of images is available from the first author.





Study 3: Image Validation

The main purpose of this study was to validate the CaTIS with a large, independent sample of participants. We hypothesized that participants' ratings would confirm the established image categories in that participants would provide higher threat ratings towards high-threat images than low-threat images, and provide higher crime ratings towards high-crime images than low-crime images (Hypothesis 1). We predicted that participants' threat and crime ratings would positively correlate for threat-andcrime images and neutral images, but not for threat-only and crime-only images (Hypothesis 2).

Another objective of this study was to understand the relationship between fear, threat, and crime by analysing how participants' ratings correlated. We also determined whether image classifications of threat or crime—independently or in combination influenced participants' fear ratings. Next, we explored the relationship between participants' fear ratings to the CaTIS and traditional fear of crime measures. Finally, we investigated the relationship between anxiety, fear ratings, and traditional fear of crime and perceptions of safety measures to further understand the role of anxiety in fear of crime.

Method

We used a similar method as in Study 1 and 2; thus, we only report exceptions.

Participants. We recruited 186 participants, but deleted data from 10 participants who provided incomplete information. Participants (N = 176) in the final sample ranged in age from 19 to 68 years (M = 30.57, SD = 10.58), and 54% self-identified as female.

Design. The design was the same as for Study 1 and 2; however, the threat and crime manipulations refer to how the CaTIS images were categorized in those studies (i.e., participant-and-researcher alignment) rather than by researcher classification only.

Materials. We used the same materials as in Study 1 and 2, except that we used only the 80 CaTIS images produced from those two studies.

Procedure. It took participants approximately 60 minutes to complete the study. **Results**

After cleaning the data, we used IBM SPSS Statistics 23 for all inferential analyses. These analyses are based on both participant data points (N = 176) and image data points (n = 80; 78); we indicate throughout the text which data points used in each

analysis. We report *d* and η^2 as a measure of effect size with 95% and 90% confidence intervals, respectively, in square brackets.

Image validation. The following analyses test Hypotheses 1 and 2.

Image alignment into the four categories. We plotted the 80 images according to participants' ratings of threat and crime (see Figure 4.2). The images aligned with the 4 image categories for 78 of the 80 images. We also plotted the image ratings onedimensionally to illustrate the relationship between the images along the threat scales (*y* axis) and crime scales (*x* axis). Participants' crime ratings were more bimodal than were their threat ratings.





Note. The two crime-only images in the upper-right quadrant were removed from further analyses, leaving a final set of 78 images.

We conducted a Discriminatory Function Analysis on the image data points (n = 80) to statistically determine whether the images aligned with the four categories. The overall chi-square test was significant, Wilks' $\lambda < .01$, χ^2 (6) = 483.92, p < .01, with 97.50% of images correctly classified. Two images from the crime-only group did not align with the original evaluation study outcomes (i.e., two crime-only image data points fell in the crime-and-threat quadrant; see Figure 4.2). We removed these 2 images from further analysis, resulting in 78 images in the CaTIS.

Threat ratings. To measure internal consistency of the image categories, we calculated the Cronbach α coefficients (in parentheses) for participants' threat ratings for each image category: threat-and-crime (.95), threat-only (.97), crime-only (.93), and neutral (.89). These demonstrated sufficient internal consistency (recommended $\alpha > .70$; DeVellis 2012). To test whether participants rated the threatening images as more threatening than non-threatening images (Hypothesis 1), we calculated four separate threat scores across the four image categories for each participant (N = 176).

Table 4.1

	Threat ratings		Crime 1	Crime ratings			atings
Image category	М	SD	М	SD	М	r	SD
Threat-and-crime images (20)	5.09 _a	1.27	6.15 _a	0.78	4.2	5 _a	1.70
Threat-only images (20)	5.26a	1.33	1.35 _b	0.73	4.3	8 _a	1.59
Crime-only images (18)	2.86 _b	1.11	5.19 _c	1.08	2.22	2 _b	1.00
Neutral images (20)	1.26c	0.42	1.26c	0.48	1.13	8c	0.37

Means and Standard Deviations for Participant Ratings Across the CaTIS Image Categories (Study 3; N = 176).

Note. The number in parentheses reflects the number of images in each category. Subscript letters denote significant post hoc differences using Bonferroni adjustments (.05/4 = .0125) between ratings in the same column.

Table 4.1 gives the means and standard deviations for participants' ratings across the four CaTIS image categories. A one-way repeated measures ANOVA revealed that participants' threat ratings differed significantly across the image categories, Wilks' $\lambda = .08$, F(3, 173) = 678.33, p < .01, $\eta^2 = .92$ [.90, .93]. Post-hoc

comparisons using the Bonferroni adjustment revealed that participants' threat ratings for the threat-and-crime and threat-only images did not differ significantly but, as predicted, these threat ratings were significantly higher than for the crime-only and neutral images. Participants also rated crime-only images as more threatening than neutral images.

Crime ratings. The Cronbach α coefficients (in parentheses) for crime ratings also revealed sufficient internal consistency: threat-and-crime (.90), threat-only (.94), crime-only (.90), and neutral (.94). To test whether participants rated the crime images as more crime-related than non-crime images (Hypothesis 1), we used the same analysis as for threat ratings (see Table 4.1). Participants' crime ratings varied significantly across categories, Wilks' $\lambda = .03$, F(3, 173) = 1705.95, p < .01, $\eta^2 = .97$ [.96, .97]. Posthoc comparisons using the Bonferroni adjustment established significant differences between participants' crime ratings of threat-and-crime images and crime-only images compared to threat-only images and neutral images, as predicted. Participants also rated threat-and-crime images as significantly more crime-related than crime-only images. There was no significant difference in the crime ratings of the threat-only and neutral images.

The relationship between threat and crime. We used participant data points (N = 176) to explore the correlations between participants' threat and crime ratings. We had predicted that the strength of the relationship between threat and crime ratings would vary across the four image categories (Hypothesis 2). As predicted, participants' threat and crime ratings were positively correlated for both the threat-and-crime and neutral image categories, but not for the threat-only image category (see Figure 4.3). Unexpectedly, the threat and crime ratings positively correlated for the crime-only images, suggesting a more complex relationship than anticipated.

Figure 4.3. Correlations between participants' (N = 176) threat ratings and crime ratings for crime-only (Part a), threat-and-crime (Part b), neutral images (Part c), and threat-only (Part d) in Study 3.



Exploring participants' fear ratings when viewing the CaTIS. In the following analyses we explored the relationships between participants' fear, threat, and crime ratings. Then, we examined how the different types of images influenced participants' fear ratings. The Cronbach α coefficients (in parentheses) for fear ratings in each image category showed high internal consistency: threat-and-crime (.97), threat-only (.96), crime-only (.93), and neutral (.87).

Fear, threat, and crime ratings. To explore the relationships between fear, threat, and crime ratings for each image (n = 78), we correlated each image's fear rating with its threat and crime ratings. Fear was significantly correlated with threat ratings

5

and with crime ratings (see Figure 4.4). To explore these relationships further, we calculated two sets of partial correlations.

Fear and threat partial correlation. There was a strong, positive, significant partial correlation between fear and threat ratings, controlling for crime, r(78) = .99, p < .01. There was no change to the zero-order correlation, r(78) = .99, p < .01, showing that controlling for crime had minimal effect on the strength of the relationship between threat and fear.

Fear and crime partial correlation. Inspection of the zero-order correlation showed a positive, significant relationship between fear and crime ratings, r(78) = .31, p < .01; however, controlling for threat with a partial correlation affected the direction and strength of the relationship between fear and crime, r(78) = .21, p = .07.



Figure 4.4. Plot of fear vs. threat ratings (Part a) and fear vs. crime ratings (Part b) for each of the 78 images in Study 3.

Exploring how threat and crime influence fear ratings. To determine if threat, crime, or both influenced fear ratings, we explored how threat and crime images affected participants' fear ratings. A two-way ANOVA using participant data points (N = 176) revealed significant main effects for threat, Wilks' $\lambda = .17$, F(1,175) = 875.34, p < .01, $\eta^2 = .83$ [.80, .86], and crime, Wilks' $\lambda = .86$, F(1,175) = 28.61, p < .01, $\eta^2 = .14$ [.07, .22], that should be interpreted within their significant interaction, Wilks' $\lambda = .65$, F(1,175) = 93.25, p < .01, $\eta^2 = .35$ [.26, .43]. As reported in Table 4.1, participants gave significantly higher fear ratings towards the threat-and-crime and threat-only images than the crime-only images, which had significantly higher fear ratings than the neutral images.

Relationships between CaTIS fear ratings and traditional fear of crime measures. To explore the relationships between participants' fear ratings towards the CaTIS and traditional measures (fear of crime [M = 3.39, SD = 0.46], the crime worry sub-scale [M = 1.98, SD = 1.04], and perceptions of safety [M = 3.66, SD = 0.62]), we calculated Pearson product-moment correlation coefficients (see Table 4.2). Participants' fear of crime scores did not significantly correlate with their fear ratings for low-threat images, but did for high-threat images. Participants' crime worry scores correlated only with their fear ratings towards neutral images. Participants' fear ratings across each image category were negatively correlated with their perceptions of safety scores.

Table 4.2

Fear ratings per	Traditional Measures									
category	Fear of Crime	Crime Worry sub- scale	Perceptions of Safety							
Threat-and-crime	.24**	.09	30**							
Threat-only	.16*	03	25**							
Crime-only	.11	.08	33**							
Neutral	.14	.18*	26**							

Correlations Between Participants' (N = 174) Fear Ratings for CaTIS Categories and Traditional Measures (Study 3)

Note. Pearson product-moment correlation coefficient, *p < .05, **p < .01.

Anxiety, the CaTIS, and traditional fear of crime measures.

Correlations. To explore whether anxiety (M = 0.96, SD = 0.69) is a possible driver of fear ratings, we calculated Pearson product-moment correlation coefficients between participants' anxiety scores and their perceptions of safety, fear of crime, crime worry, and CaTIS fear ratings (see Table 4.3). Participants' anxiety scores correlated positively with their fear ratings across all image categories except threat-only. Anxiety scores also correlated with traditional fear of crime measures.

Table 4.3

	Mean score correlations ¹					Inde	pendent <i>t</i> -test re	endent <i>t</i> -test results ²						
		Lo anxiety $n =$	Low anxiety group n = 133		Clinical level anxiety group n = 41									
Measures and Fear Ratings	Anxiety score	М	SD		М	SD	t	df	Cohen's d	95% CI				
Fear of Crime	.23**	3.33	0.60		3.60	0.89	2.25	172	0.40	[0.04, 0.75]				
Crime Worry sub-scale	.32**	1.85	0.91		2.42	1.30	3.21**	173	0.56	[0.21, 0.91]				
Perceptions of Safety	36**	3.76	0.56		3.33	0.68	4.10**	172	0.73	[0.37, 1.08]				
All images (78)	.19*	2.92	0.94		3.18	0.97	1.56	174	0.27	[-0.07, 0.62]				
Threat-and-crime (20)	.16*	4.17	1.70		4.55	1.68	1.27	174	0.22	[-0.12, 0.57]				
Threat-only (20)	.10	4.35	1.60		4.48	1.56	0.47	174	0.08	[-0.27, 0.43]				
Crime-only (18)	.19**	2.01	0.90		2.31	1.10	1.81	174	0.32	[-0.03, 0.66]				
Neutral (20)	.28**	1.13	0.26		1.36	0.57	3.56**	174	0.64	[0.29, 0.99]				

Correlations Between Participants' (N = 176) Fear Ratings and Anxiety Scores, and Comparisons of Fear Ratings According to Clinical Level of Anxiety

Note. ¹Pearson product-moment correlation coefficient, *p < .05, **p < .01. ² **Significance level with Bonferroni adjustments (.05/8 = .006). Degrees of freedom differ because some participants did not complete all measures.

The relationship between clinical anxiety and fear. Participants were split into two groups: those with a low level of anxiety and those with a clinical level of anxiety based on APA (2013) scoring conventions. We used independent sample t-tests (with a Bonferroni adjustment; .05/8 = .006) to compare participants in the clinically-anxious group with those in the non-clinical group in terms of their fear of crime, crime worry, perceptions of safety, and CaTIS fear ratings (see Table 4.3). Three significant differences emerged between the clinically-anxious and non-clinical groups: the clinically-anxious group rated neutral images as more fear-provoking, reported greater crime worry, and reported lower perceptions of safety than the non-clinical group.

Discussion

As predicted, participants rated high-threat images as more threatening than lowthreat images, and rated high-crime images as more crime-related than low-crime images. Participants' threat and crime ratings positively correlated for threat-and-crime, crime-only, and neutral images, but not for threat-only images. We also found that threat—but not crime—had a strong relationship with participants' fear ratings.

General Discussion

One goal of this research was to develop and validate a set of images varied in terms of threat and crime for use in experimental studies. Study 1 and 2 allowed us to refine over 170 images to 20 images in each of four categories (80 in total). In Study 3, we validated 78 of these 80 images for inclusion in the final image set that we named the Crime and Threat Image Set (CaTIS). Despite an unequal number of images in each category, the point of including multiple images is for stimulus sampling and to ensure that participants' responses are not driven by unique images (Wells & Windschitl 1999). A subset of 18 images is sufficient to do that.

Experimentally examining the separate and combined influences of threat and crime on participants' fear ratings revealed that threat had a greater influence on fear than crime. We also found that participants' fear of crime, as measured traditionally, had a relationship with high-threat images but not low-threat images, even when these images were crime-related. This all provides evidence for the broad-rather than the narrow—pathway to fear of crime (Ferraro 1995; Hirtenlehner & Farrall 2013). Crime may be a subset of generalised fears, paralleling other types of specific fears (such as those towards snakes and spiders; APA, 2013). Taken together, our results suggest that traditional fear of crime measures may be measures of general fear and anxiety rather than fear of crime specifically.

Limitations

This research used a convenience sample of university students, a practice that is common in psychological experiments (Henrich Heine & Norenzayan 2010). Convenience samples are often more easily accessed for experiments where manipulations allow for causal inferences (Druckman & Kam 2009). Our validation of the CaTIS with university students has been appropriate because the CaTIS is ideal for experimental use. Researchers could engage community members to validate the tools with that population in the future.

We found that participants with high anxiety assigned higher fear ratings towards neutral images but not the other kinds of images. We also found a relationship between participants' fear ratings towards these neutral images and crime worry. A possible explanation for this is that presenting neutral images alongside threatening and/or crime-related images as part of our within-subjects design may have primed participants to view all images as somewhat threatening. Further research with the CaTIS could use a between-subjects design, exposing participants to only one category of images, to limit potential priming effects.

An additional limitation of the CaTIS is that images differ from real-life threat cues—thus, it is unlikely that we are tapping into actual fear responses (Garofalo 1981). Our participants may have made cognitive rather than affective appraisals when rating the images. Further research with the CaTIS could explore participants' emotional appraisals separate from cognitive processing (e.g., physiological research). The CaTIS can add to our understanding of the quality of emotional reactions to the threat of crime by allowing for immediate and uncontrolled reports of emotional expression.

Future Directions

The CaTIS offers a new way to experimentally explore the relationships between fear, threat, and crime. The CaTIS also has practical advantages when compared to large-scale surveying. Researchers can control how images are presented to participants, record immediate responses, and make comparisons across manipulated variables. Although still susceptible to self-report biases, the strength of the CaTIS is that it has in-built controls in the form of neutral images, and can be administered alongside measures of social desirability or other relevant variables. Furthermore, randomly assigning participants to different images conditions (as opposed to the within-subjects approach used here) can assist in better understanding causal relationships between variables of interest. Overall, the CaTIS presents an innovative research tool to explore the dynamics and central assumptions of fear of crime.

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The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime

Technical Appendix

Measures used in Study 1, 2, and 3

Image ratings. Under each image, we included the following five statements: (1) "this is relevant to my life," (2) "this is threatening to most people," (3) "this is harmful," (4) "this scares me," and (5) "this makes me think of crime." Statement 1 was excluded from subsequent analyses because it was beyond the scope of this study. We included statements 2 and 3 to capture the concept of threat. We analysed statement 2 (referred to hereafter as a threat rating) because it had higher face validity than statement 3 (DeVellis 2012); nonetheless, the two statements were significantly correlated, r(176) = .89, p < .01, suggesting that these statements were measuring the same construct. Statement 4 measured participants' fear response (referred to hereafter as a fear rating), and statement 5 measured participants' rating of whether the image was related to crime (referred to hereafter as a crime rating).

Demographic items. These included age, sex, postcode, country of birth and country of current residence, education level, and current employment status.

Jackson's (2006) Fear of Crime Measure. Jackson's 20-item measure examines four constructs (crime worry, likelihood estimates, perceived effect on life, level of perceived control) across five different criminal events (e.g., "being attacked by a stranger in the street"). For the crime worry subscale participants indicated that they worried "not once in the last month," "once or twice in the past month," "once or twice in the past week," or "every day." We recoded participants' answers as 1, 3, 5, and 7, respectively, to align with the other components of the scale. For likelihood estimates, participants rated how "likely" a crime event is from 1 (*definitely not going to happen*) to 7 (*certain to happen*). For perceived effect on life, participants rate how much the crime event would affect their life. Finally, for level of perceived control, participants rated how much control they felt they had over becoming a victim. These two components were rated from 1 (*not at all*) to 7 (*to a very great extent*), and level of perceived control was reverse scored. We calculated each participants' score by averaging their responses. In our sample, the total measure had a Cronbach's α coefficient of .72. We used this measure because it has been validated (Jackson 2006) and widely used (e.g., Chataway & Hart 2016). We subsequently analysed both a total score for the measure, and the crime worry sub-scale (also an averaged score) due to its face validity with fear of crime specifically, for which the Cronbach α co-efficient was .79.

The Australian Bureau of Statistics (ABS 2014a) Perceptions of Safety Measure. The Australian Government uses this measure as part of biannual Report of Government Services to assess the efficiency and effectiveness of Government-funded services (such as the police force). The questionnaire included two blocks of questions. The first block asks about respondents' feelings of safety in four different locations at two time points ("at night" and "during the day"). The rating options vary from 1 (*very unsafe*) to 5 (*very safe*). The second block asks about two problems in participants' neighbourhoods: "speeding cars, dangerous or noisy driving," and "illegal drugs". Participants rate the extent of the problem from 1 (*not at all a problem*) to 5 (*a major problem*). Responses to the second block are reverse scored. We averaged all responses from each participant. In our sample, the Perceptions of Safety Measure had a Cronbach α co-efficient of .79. Although not standardised, we used this measure because the Australian Government uses it to evaluate the effectiveness of justice services (ABS 2014a).

The Severity Measure for Generalised Anxiety Disorder (GAD) – Adult (APA 2013). This is a 10-item clinical measure of anxiety levels. Participants are asked to consider the previous week and state whether a thought, feeling, or behavior associated with anxiety had been present 0 (*never*), 1 (*occasionally*), 2 (*half the time*), 3 (*most of the time*), or 4 (*all the time*). We then calculated the mean to determine levels of anxiety from none (0) to extreme (4). In our sample, this measure had a Cronbach α coefficient of .90. The majority of our participants had no (n = 46) to mild (n = 88) levels of anxiety. Some participants reported clinical levels of anxiety either in the moderate (n = 35) or severe range (n = 7). No participant reported an extreme level of anxiety.

Other scales. The Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds 2006) measures the extent of socially-desirable reporting. We also developed a measure of Stranger Victimization. This included the same crime items as Jackson's (2006) measure, with ratings of whether these crimes had been experienced "never", "once", or "more than once". Policing Satisfaction was measured using a Government

measure (ABS 2014a) of four items. Responses to these three questionnaires were beyond the scope of this manuscript; results are available from the first author.

Procedure for all studies

The online study was presented using Qualtrics software (http://www.qualtrics.com). Participants provided informed consent, answered demographic questions, and completed the Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds 2006) and the anxiety measure. Participants were then informed that they would view images and be asked to provide ratings for each image. Instructions encouraged participants to be spontaneous and to not think too much about their ratings. Images were displayed individually with a screen resolution of 480 x 640 pixels, presented in random order, and remained on the screen until the participant advanced to the next page. After rating all images, participants completed the perceptions of safety and fear of crime measures, the Stranger Victimization measure, and the Policing Satisfaction (ABS 2014a) measure. Participants were debriefed and thanked for their time.

Image Search and Selection

Our goal was to validate approximately 100 images across the four categories of the CaTIS: threat-and-crime, threat-only, crime-only, and neutral. We were not sure which images would be rated by participants as high-threat or low-threat and high-crime or low-crime and we wanted a final image set that had some variability of images; thus, we found and produced 129 images to evaluate in Study 1. We obtained 95 of these images under a Creative Commons license on the Flickr database. We used search terms related to crime (e.g., crime, criminal, homicide, terrorism, crime scene, crimes against humanity, genocide, stab, sexual assault, arson, mug shot, suspect, tazer, police, riot, victim, arrest, dark alley, break enter, burglary, drugs, weapons, guns, meth lab, police, judge, magistrate, court room) and threat (e.g., syringe, public speaking, dentist, clown, monster, alien, shark, scary dog, crocodile). We also acquired 30 images from the GAPED (snakes [2], spiders [2], and neutral objects [26]; Dan-Glauser & Scherer 2011), and we produced four original photographs. We (the researchers) then assigned researcher classifications to the 129 preliminary images, assigning each image into one of four distinct categories: neither threatening nor crime-related (referred to hereafter as neutral images; n = 26; e.g., a bookshelf), crime-related but not threatening (referred to hereafter as crime-only images; n = 27; e.g., a graffitied wall), threatening but not

crime-related (referred to hereafter as threat-only images; n = 34; e.g., a snake), or both threatening and crime-related images (referred to hereafter as threat-and-crime images; n = 42; e.g., a riot). We considered items to be high-threat when they depicted items or scenes that could be considered harmful to human longevity (e.g., a violent crime, a snake); and high-crime when they depicted scenes that were conceptually related to crime in a non-ambiguous fashion (e.g., illegal behaviors). For the evaluation, we did not seek to present an equal number of images in each category.

Detailed Results of Study 1 and 2

We deemed an image as suitable for inclusion in the CaTIS if our researcher classifications and participants' ratings aligned. To compare our classifications (high or low) and participants' ratings (1 to 7), we recoded each participant's ratings towards the *disagree* anchor (1, 2, or 3) as -1, ratings towards the *agree* anchor (5, 6, or 7) as 1, and a midpoint (4) rating as 0. These participants' ratings were then averaged, resulting in a negative score or a positive score (no images had an average score of 0). Thus, each image had four dependent measures associated with it: our researcher classifications on threat (high or low) and crime (high or low) and participants' ratings on threat (positive or negative).

Threat-and-crime images. In Study 1, our classifications and participants' ratings aligned for 24 of the 42 threat-and-crime images. The 4 images with the lowest participants' ratings were removed to create a set of 20 images. The final 20 threat-and-crime images depicted crime scenes involving human bodies (8), riots and rioting (6), a person committing a violent offence (3), human remains (2), and hooded people in chains (1). Because Study 1 produced 20 suitable threat-and-crime images, we did not include further threat-and-crime images in Study 2.

Threat-only images. In Study 1, our classifications and participants' ratings aligned for only 10 of the 34 images. This low level of alignment could be explained by the diverse content in this image set, as well as the inclusion of more abstract items (e.g., a microphone in front of a large audience to elicit fears of public speaking, dentist scenes, syringes, clowns, monsters, and aliens) that were not uniformly rated by participants as threatening. This data-driven approach revealed that our classifications and participants' ratings aligned for only images that depicted threatening animals, such as snakes and spiders. Despite the animal theme that emerged in the threat-only image category, we retained the threat (as opposed to animal threat) label because the

preliminary pool of images contained a variety of images, but these were the ones that emerged as consistently threatening. Other research has used similar types of images to investigate threat (e.g., Fox, Griggs & Mouchlianitis 2007, Dan-Glauser & Scherer 2011).

In Study 2, we tested 29 new threat-only images. Participants' ratings and our classifications aligned for 25 of the 29 images. We combined these with the 10 images from Image Evaluation Study 1, and then excluded images to make a set of 20 images with sufficient diversity (e.g., we reduced the number of spider images). The threat-only images depicted crocodiles (4), sharks (4), snakes (4), snarling dogs (4), and spiders (4).

Crime-only images. In Study 1, our researcher classifications and participants' ratings aligned for only 8 of the 27 images. We categorised a variety of images depicting police as crime-related; however, participants' ratings did not align with our classifications. Participants did, however, rate graffitied walls and crime scene investigation images as crime-related but not threatening. Because of the low number of suitable images in this category, we also investigated the 18 images that did not align in the threat-and-crime image category to see if participants rated any as crime-related but not threatening. There were 2 such images (e.g., a police officer with a drawn weapon), which we then included in this category, bringing the total number of suitable crime-only images to 10. In Study 2, we tested 20 new crime-only images. Participants' ratings and our researcher classifications aligned for 11 of the 20 images. We combined these 11 with the 10 images from Study 1 and removed the lowest rated image to create a set of 20 images. The crime-only images depicted crime scene evidence collection (7), graffiti on walls (6), police making an arrest (3), anti-violence events (2), and a non-violent offence (e.g., shoplifting; 2).

Neutral images. In Study 1, our researcher classifications and participants' ratings aligned for all 26 images. We randomly removed 6 images to create a final set of 20 images that depicted household objects (7), home interiors (5), furniture (5), building materials (2), and a group of people (1). Because Study 1 produced 20 neutral images, we did not include further neutral images in Study 2.
Chapter 5: Paper 2

Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)

Original Paper Under Review at Sex Roles (submitted 9th December 2017) Unblinded Manuscript

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Please note that I have made small alterations to this Paper for thesis presentation. These changes were limited to the formatting of margins, line spacing, placement of tables and figures, numbering of tables and figures, unblinding this manuscript, removing all reference lists (which are compiled at the end of the thesis), and altering some in-text citations to align with this compiled list. As no other changes were made, the referencing style and language requested by *Sex Roles* were retained.

Abstract

The fear of crime gender paradox is pervasive—women are more fearful of stranger victimization than men, but men report higher rates of actual victimization. Little is known, however, about whether threat or crime drives this gender paradox. To tease apart the influences of threat and crime on men's and women's fear ratings we used an online quasi-experiment with a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) mixed-factorial design, with threat and crime as within-subject manipulations. Participants (N = 176) viewed 78 images—varying across threat and crime—from the Crime and Threat Image Set (CaTIS) and provided a fear rating for each image. Participants also completed traditional fear of crime measures, and measures of anxiety, social desirability bias, victimization, and policing satisfaction. Men's (n = 81) and women's (n = 95) responses to traditional measures reflected the established fear of crime gender paradox: men reported higher perceptions of safety and lower fear of crime than women. Participants' fear ratings when viewing the CaTIS revealed a more complex picture. Women reported higher fear than men for high-threat, but not high-crime, images. Levels of anxiety and social desirability bias did not influence the relationship between gender and threat. Results showed that the fear of crime gender paradox is not narrowly and exclusively related to crime, but instead may reflect a broader *fear of threat* gender paradox.

Keywords. Crime and Threat Image Set, fear of crime, gender differences, gender, threat

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Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)

Fear of crime describes the emotional response elicited by our concern that a stranger may attack us or steal our property (Hale, 1996; Warr, 2000). High levels of fear of crime saps people's time and energy (Dolan & Peasgood, 2007), negatively affects their physical and mental health (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford, Chandola, & Marmot, 2007), and limits their community participation (Zubrick et al., 2010). Importantly, higher fear levels are not associated with enhanced safety (Jackson, 2009).

In Western communities, women typically report greater fear of crime than men (Cops & Pleysier, 2011; Goodey, 1997; Jackson, 2009). This presents a gender paradox (Carcach & Mukherjee, 1999; Smith & Torstensson, 1997) because men are at greater risk than women of being violently victimized by strangers, except in the case of sexual violence (Harrell, 2012; Australian Bureau of Statistics [ABS], 2014b). Little research, however, has explored whether threat or crime drives women's and men's fear of crime reports (cf. Schafer, Huebner, & Bynum, 2006), nor explored how these fear reports might relate to gendered responses to threatening stimuli. The current study sought to tease apart the influences of threat and crime on men's and women's fear ratings to elucidate the fear of crime gender paradox.

Explanations for the Gender Paradox

Explanations for the fear of crime gender paradox centre on women's overestimations—rather than men's under-estimations—of risk (Franklin & Franklin, 2009; Lee, 2018). Although some researchers have provided evolutionary explanations for women's enhanced fear of crime (Fetchenhauer & Buunk, 2005), many consider gender socialization processes as fundamental to understanding the gender paradox (e.g., Eagly & Wood, 1999; Holloway & Jefferson, 1997; Rader & Haynes, 2011). Compared to men, women receive more messages from their families (De Groof, 2008) and the media (Hollander & Rodgers, 2014) that highlight their perceived lack of safety, autonomy, and control (Burt & Estep, 1981; Harris & Miller, 2000; Katz, 2013). Women, but not men, may also be primed to conflate their actual increased risk of sexual assault with their perceived risk of non-sexual stranger victimization (Hirtenlehner & Farrall, 2014; Ugwu & Britto, 2015; Warr, 1985). This 'shadow of sexual assault' thesis (Ferraro, 1996) has been affirmed by researchers in the United States (Dobbs, Waid, & Shelley, 2009; Lane, Gover, & Dahod, 2009), Sweden (Özaşçılar, 2013), and Turkey (Özaşçılar & Ziyalar, 2017).

Women also experience greater levels of street harassment (Junger, 1987; Lupton, 1999b), family violence (Flood & Fergus, 2008), and sexual assault (Ferraro, 1996) than men, all of which may imply that they are under constant threat (Smith & Torstensson, 1997). These experiences of harassment, family, and sexual violence are not adequately measured by fear of crime surveys that focus on stranger victimization and physical assault (Broll, 2014; Gilchrist, Bannister, Ditton, & Farrall, 1998). Such experiences may also mitigate the paradox as women may not be over-responding to risk but responding commensurately with the underreported crime they experience (Grech and Burgess, 2011). If women learn to be afraid through these gender socialization processes, this may explain women's enhanced attention to signs of community disorganization (Schafer, Huebner, & Bynum, 2006; Snedker, 2015) and heightened perceptions of crime-related danger (Harris & Miller, 2000) which may also enhance self-assessments of vulnerability that can increase fear of crime reports (Killias & Clerici, 2000).

Gender differences in fear reports are not restricted to crime alone. Women experience phobias at twice the rate of men (Fredrikson, Annas, Fischer, & Wik, 1996) and write more about their fear-based emotions online (Kamvar & Harris, 2009). In an analysis of data from 37 countries, women were more likely to report sadness and fear and less likely to report anger than men (Fischer, Rodriguez Mosquera, Van Vianen, & Manstead, 2004). In addition, compared to men, women were also much more likely to experience anxiety-related disorders, to report negative emotions, worry more, ruminate more, and read social cues more sensitively (McLean & Anderson, 2009). The tendency to regard internalised emotions of sadness, fear, and anxiety as more feminine, and externalised emotions of anger as more masculine may explain these observed differences (Bem, 1981; Brody & Hall, 2010). Adults attribute these gender differences to children from a young age (Condry & Condry, 1974), which may lead to different behavioural responses in threatening situations, such as those observed in the increased likelihood of women fleeing fires while men fight fires (Whittaker, Eriksen, & Haynes, 2015), when women show greater caution when exploring novel virtual environments than men (Gagnon, Cashdan, Stefanucci, & Creem-Regehr, 2015), when women exhibit greater avoidance of tarantulas than men (Stoyanova & Hope, 2012), or when women

pay more attention to health and safety risks than men (Gustafsod, 1998). Overall, this may be a result of socializing women (Hollander, Renfrow, & Howard, 2011) to feel less confident to confront threats and also to feel more vulnerable when threats are present. This is not to dismiss the role of men's under-attendance to threats and increased propensity for risk-taking (Harris, Jenkins, & Glaser, 2006), which are key explanations for men's reduced longevity in spite of significant social, economic, and political advantages (Assari, 2017).

The Role of Anxiety and Social Desirability

Other factors may also influence the observed gender differences towards traditional fear of crime measures. Women may experience more anxiety than men (Eaton et al., 2012); people who experience higher levels of anxiety are more likely to attend to threatening stimuli than those with lower levels of anxiety (e.g., Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van Ijzendoorn, 2007; Sheppes, Luria, Fukuda, & Gross, 2013; Sylvester, Hudziak, Gaffrey, Barch, & Luby, 2016). If crime is another domain onto which anxious individuals project their fear (Hirtenlehner & Farrall, 2013), and women are more anxious than men overall, then anxiety levels may partially explain the gender paradox.

There are also links between people's reported fear and willingness to report fear. Men's reports of anxiety and emotional response to (non-crime-related) threat may be negatively correlated with the social desirability bias (Asendorpf & Scherer; 1983). Further, Sutton and Farrall (2005) found that high lie-scale scores were associated with decreased fear of crime reports for men (but unrelated to women's scores), suggesting that it is more socially desirable for men to be more private and less expressive than women regarding fear that they experience.

A Novel Approach to Investigate Fear of Crime

The fear of crime gender paradox is one of the most pervasive and compelling concepts in the victimology and crime prevention literatures (Jarrett-Luck, 2015). That said, there is little research examining whether this paradox reflects a gender dynamic unique to crime or is another example of how men and women respond differently to a variety of threatening situations. To address this question and to further our understanding of fear of crime, Noon, Beaudry, and Knowles (2017) recently developed, evaluated, and validated the Crime and Threat Image Set (CaTIS). The CaTIS is a set of 78 images which can be divided into four distinct categories: threat-

and-crime, threat-only, crime-only, and neutral images (see Figure 5.1). Across three studies participants rated some images to be threatening but not crime-related (threat-only, e.g. a snake), crime-related but not particularly threatening (crime-only, e.g. graffiti), both crime-related and threatening (threat-and-crime, e.g. a homicide scene), and neither crime-related nor threatening (neutral, e.g. a bookshelf). Despite attempts to include "threat-only" images of common fears and phobias (American Psychiatric Association [APA], 2013; Muris, Schmidt, & Merckelbach, 1999), such as needles, dentists, public speaking, clowns, heights, storms, roller coasters, graveyards, drowning, being buried, and monsters, participants consistently rated only images of animals as threatening. This is consistent with the psychological threat literature (e.g., Blanchette 2006), although many of these studies have not used the same data-driven validation processes undertaken by Noon and colleagues (2017). Using the CaTIS, Noon et al. established that threat, rather than crime, influenced participants' fear ratings. However, they did not examine the gender paradox and how the CaTIS can elucidate the differences between men's and women's reported fear.



Figure 5.1. Sample images from each CaTIS (Noon et al., 2017) image category. Originally published in the *Journal of Experimental Criminology*.

Current Study

In the current study, we re-examined Noon et al.'s (2017) data to determine whether threat and/or crime influenced men's and women's fear ratings. We expected women to report greater fear than men in response to traditional fear of crime measures (e.g., Jackson, 2006), in line with previous research (Cops & Pleysier, 2011; Goodey, 1997). Traditional measures cannot tease apart how threat and crime differentially affect men's and women's fear ratings; however, the CaTIS allows us to examine the independent influences of threat and crime on participants' fear ratings.

We explored two competing hypotheses. On the one hand, the fear of crime gender paradox may be driven by crime alone with or without threat. Emergence of a significant Gender x Crime interaction would suggest that crime alone drives fear, with women providing higher fear ratings to high-crime (but not low-crime) images than men. Additionally and in line with this first hypothesis, if both threat and crime influence the gender paradox, we should find a significant three-way Gender x Threat x Crime interaction on participants' fear ratings, with women providing higher fear ratings to both high-threat and high-crime images than men. Both types of interactions would support the fear of crime gender paradox. Alternatively, if the fear of crime gender paradox is driven by threat but not crime, then Gender x Threat should interact significantly, with women providing higher fear ratings to high-threat (but not lowthreat) images than men (e.g., Bradley, Codispoti, Sabatinelli, & Lang, 2001; Gustafsod, 1998; Schmitz & Grillon, 2012). Support for this competing hypothesis would suggest that the gender paradox is driven by a fear of threat rather than a fear of crime.

Method

We further examine data originally presented in Study Three from Noon et al. (2017) to explore gender differences. We present the key methodological components of that study and refer readers to Noon et al. (2017) for a more detailed methodology. **Participants**

Noon et al. (2017) recruited a convenience sample of participants (N = 186) from an Australian university who participated in exchange for course credit. After removing ten participants from the sample with incomplete data, the final sample (N =176) consisted of self-identified men (n = 81) and women (n = 95) ranging in age from 19 to 68 years (M = 30.57, SD = 10.58).

Design

For this research we used a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) mixed-factorial design. Gender was a self-identified between-subjects factor, and threat and crime were within-subjects manipulations. Threat refers to whether the content of the image was categorised in Noon et al.'s (2017) validation process as threatening (high) or not (low), and crime refers to whether the content of the image was categorised as related to crime (high) or not (low). The main dependent variable was participants' fear rating to each image.

Materials

Images. The CaTIS consists of 78 images that were validated across an extensive three study evaluation and validation process (Noon et al., 2017). Through this process, participants assessed a total of 178 images to categorise them according to threat and crime. It was participants' who determined whether images were threatening and/or crime-related by providing ratings that were used to categorize each image into one of four image categories. The final CaTIS consists of 78 images in four image categories: (1) threat-and-crime (high-threat and high-crime; e.g., a riot, charred bodies, a homicide scene); (2) threat-only (high-threat and low-crime; e.g., a spider, a snake); (3) crime-only (low-threat and high-crime; e.g., police arresting a member of the public, graffitied walls); and (4) neutral (low-threat and low-crime; e.g., a desk, a chair). Therefore, CaTIS images are either high-threat or low-threat and high-crime or low-crime. See Figure 5.1 for example images.

Measures.

Noon et al. (2017) used measures to gauge participants' responses to the CaTIS, traditional fear of crime measures, victimization, policing satisfaction, social desirability bias, anxiety, and demographic information.

Rating scales. Five statements to measure threat ("This is threatening to most people" and "This is harmful"), crime-relatedness ("This makes me think of crime"), relevance ("This is relevant to my life"), and fear ("This scares me") underneath each CaTIS image on a 7-point Likert scale from *strongly disagree* (1) to *strongly agree* (7). The current study focuses on participants' fear ratings to the statement "This scares me". This statement was derived by Noon et al. (2017) in consultation with other researchers, as well as reflections of statements used in the Postive and Negative Affect Scale (PANAS) to calculate fear levels (Crawford & Henry, 2004).

For each participant, we calculated fear ratings for each of the four image categories by averaging this score for all images in the relevant image category. This stimulus sampling approach (Wells & Windschitl, 1999) ensured that participants' fear ratings were not unduly influenced by idiosyncratic responses or unique images. Higher scores indicate greater fear (hereafter referred to as the fear rating) with a possible range of 1–7. To measure internal consistency for the fear ratings within each of the four image categories, we calculated Cronbach α co-efficients (reported in parentheses; DeVellis, 2012). All image categories had good internal consistency: threat-and-crime (.97), threat-only (.96), crime-only (.93), and neutral (.87).

Traditional fear of crime measures. Noon et al. (2017) had selected two fear of crime measures that have been used by fear of crime researchers previously.

Perceptions of safety. The Australian Government biannually evaluates the effectiveness of criminal justice services (ABS, 2014a). Their measure comprises 11 items in two separate blocks. In the first block, participants rate their feelings of safety in four different locations (e.g., "on public transport," "at home") at two time points ("at night" and "during the day") on a scale from *very unsafe* (1) to *very safe* (5). In the second block, participants indicate their concern about "speeding cars, dangerous or noisy driving," and "illegal drugs" in their local neighbourhood on a scale from *not at all a problem* (1) to *a major problem* (5). We reverse scored the items from the second block. We then averaged each participant's score for all items, resulting in a possible range of 1–5, with higher scores indicating greater perceptions of safety. For this study, this measure had sufficient internal consistency (Cronbach $\alpha = 79$).

Fear of crime. Jackson's (2006) 20-item Fear of Crime Measure is validated and widely used (e.g., Chataway & Hart, 2016). For this measure, participants answer a series of questions in response to five different crime events (e.g., "being attacked by a stranger on the street"). Participants rate how "likely" each crime event is from *definitely not going to happen* (1) to *certain to happen* (7), how much the crime event would "affect" their life from *not at all* (1) to *a very great extent* (7), and how much "control" they feel they would have over experiencing this crime from *not at all* (7, when reverse scored) to *a very great extent* (1, when reverse scored). With regard to crime worry, participants can indicate that they worried about the specific criminal event *not once in the last month, once or twice in the past month, once or twice in the past week*, or *every day*. In this study, we recoded participants' crime worry responses

as 1, 3, 5, and 7, respectively, to align with the other scale components. We then averaged participants' ratings to determine a final score within the possible range of 1–7, with higher scores indicating greater fear of crime. For this study, the measure had sufficient internal consistency (Cronbach's $\alpha = .72$).

Victimization. This 10-item measure to determine whether participants had experienced the same five crimes events from Jackson (2006) either *never* (0), *once* (1), or *more than once* (2). Participants provided responses for both "the last 12 months" or "ever" in their lives. Noon et al. then averaged responses to derive a final score within the possible range of 0–2. A higher score indicated more victimization experiences. For this study, this measure had sufficient internal consistency (Cronbach's $\alpha = .62$).

Policing satisfaction. This measure is used by the Australian Government as part of their Report on Government Services (ABS, 2014a) to assess participants' level of satisfaction with policing services (hereafter referred to as policing satisfaction). Participants rated "How satisfied [they are] with policing services" as either *don't know* (0) or from *very dissatisfied* (1) to *very satisfied* (5). Participants also rated their personal view on three statements regarding police integrity (e.g., "Police are honest") from *strongly disagree* (1) to *strongly agree* (5). Each participant's scores were averaged to determine a final score within the possible range of 1–5. A higher score indicated greater belief in police integrity and greater satisfaction with policing services. For this study, this measure had sufficient internal consistency (Cronbach's $\alpha = .87$).

Social desirability bias. The Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds, 2006) is widely used in empirical research to measure the extent of socially desirable reporting (e.g., Francis, Dugas, & Ricard, 2016). Participants indicated whether 13 separate items (e.g., "I am sometimes irritated by people who ask favours of me") were *true* (0) or *false* (1). Five items (e.g., "No matter who I am talking to, I'm always a good listener") were reverse scored. The scale has a possible range of 0-13, with a higher score indicating greater proclivity to respond in a socially desirable manner (hereafter referred to as social desirability bias). For this study, this measure had sufficient internal consistency (Cronbach's $\alpha = .72$).

Anxiety. The Severity Measure for Generalised Anxiety Disorder – Adult is a 10-item clinical measure of anxiety levels (APA, 2013). Participants are asked to consider the previous week and state whether a thought, feeling, or behavior associated with anxiety (e.g., "felt anxious, worried or nervous") had been present *never* (0),

occasionally (1), half the time (2), most of the time (3), or all of the time (4). We calculated a mean score with a possible range of 0–4, reflecting no anxiety through to extreme anxiety. For this study, this measure had good internal consistency (Cronbach α = .90).

Demographic items. These items measured age, gender, location (by postcode), country of birth, country of current residence, current employment status, and level of educational qualification.

Procedure

Noon et al. (2017) used Qualtrics software (http://www.qualtrics.com) to present the online study. Participants provided informed consent, answered demographic questions, and completed the social desirability bias and anxiety measures. Participants next viewed and individually rated the randomly-presented 78 CaTIS images (Noon et al., 2017; see Figure 5.2 for an example screen-shot from the online study). Participants then completed the perceptions of safety, fear of crime, stranger victimization, and policing satisfaction measures beforing reading the debriefing statement. Participants took approximately 60 minutes to complete this study.



	1960 A 1960 B 1960	1000 100 0 000 000		Contract Balance Con				
	1	2	3	4	5	6	7	
This is relevant to my life	0	0	0	0	0	0	0	
This is threatening to most people	0	0	0	0	0	0	0	
This is something harmful	0	0	0	0	0	0	0	
This scares me	0	0	0	0	0	0	0	
This makes me think of crime	0	0	0	0	0	0	0	

Figure 5.2. Screen-shot of example image and rating scales from online survey.

Results

After cleaning the data, we used IBM SPSS Statistics Version 23 for all analyses. We report the means (*M*) and standard deviations (*SD*) for fear ratings across the threat-and-crime, threat-only, crime-only, or neutral image categories. We report the marginal means (*MM*) and standard errors (*SE*) when comparing the high and low categories for threat and crime. Specifically, *high-threat* refers to the averaged fear ratings for threat-and-crime images and threat-only images, whereas *low-threat* refers to the averaged fear ratings for the crime-only images and neutral images. Similarly, *highcrime* refers to the averaged fear ratings for threat-and-crime images and crime-only images, whereas *low-crime* refers to the averaged fear ratings for threat-only images and neutral images. We use Cohen's *d* and η^2 as measures of effect size, and report the 95% and 90% confidence intervals, respectively, in square brackets.

Responses to Traditional Fear of Crime Measures by Gender

We compared men's and women's perceptions of safety and fear of crime to determine whether the participants' responses were similar to previous studies using these traditional measures (e.g., Smith & Torstensson, 1997). As expected, women (M = 3.50, SD = 0.45) reported significantly more fear of crime than men (M = 3.25, SD = 0.45), t (172) = 3.81, p < .01, d = 0.56 [0.25, 0.85]. As expected, men (M = 3.85, SD = 0.60) reported significantly higher perceptions of safety than women (M = 3.49, SD = 0.59), t (172) = 3.98, p < .01, d = 0.61 [0.30, 0.90].

Responses to the CaTIS by Gender

The main aim of this study was to investigate whether men's and women's fear ratings differed in response to the CaTIS. We conducted a 2 (Gender) x 2 (Threat) x 2 (Crime) repeated-measures mixed ANOVA on participants' fear ratings. There was a significant main effect of gender where women (MM = 3.20, SE = 0.10) gave higher fear ratings to all images on average than men (MM = 2.72, SE = 0.10), F(1, 174) =11.93, p < .01, $\eta^2 = .06$ [.02, .13]. There was a significant main effect of threat where participants gave higher fear ratings to high-threat (MM = 4.29, SE = 0.11) than lowthreat images (MM = 1.63, SE = 0.05), Wilks' $\lambda = .16$, F(1, 174) = 919.64, p < .01, $\eta^2 =$.84 [.81, .86]. There was a significant main effect of crime where participants gave higher fear ratings to high-crime (MM = 3.15, SE = 0.09) than low-crime images (MM =2.77, SE = 0.06), Wilks' $\lambda = .87$, F(1, 174) = 27.24, p < .01, $\eta^2 = .14$ [.07, .21]. These significant main effects should be interpreted in light of the interaction effects. We found no significant three-way interaction between Gender x Threat x Crime, Wilks' λ = 1.00, F (1, 174) < .01, p = .97, $\eta^2 < .01$, and no significant two-way interaction between Gender x Crime, Wilks' $\lambda = 1.00$, F(1, 174) = 3.74, p = .06, $\eta^2 = .02$ [.00, .07]. We did find significant two-way interactions between Gender x Threat and between Threat x Crime. We explore both interactions in greater detail.



Figure 5.3. Men's (n = 81) and women's (n = 95) mean fear ratings to images in low-threat and high-threat categories. Error bars refer to the 95% confidence intervals. Different superscript letters denote significant differences (p < .01).

Gender x Threat interaction. In support of the competing hypothesis that the fear of crime gender paradox is driven by threat rather than crime, the Gender x Threat interaction was significant, Wilks' $\lambda = .92$, F(1, 174) = 14.87, p < .01, $\eta^2 = .08$ [.03, .15]. We conducted two independent sample *t*-tests to compare men's and women's fear ratings for high-threat and low-threat images, respectively. As shown in Figure 5.3, women's fear ratings were significantly higher than men's for high-threat images, *t* (174) = 3.81, p < .01, d = 0.58 [0.27, 0.88]; however, men's and women's fear ratings did not differ significantly for low-threat images, *t* (174) = 1.59, p = .12, d = 0.24 [0.06, 0.53].

Threat x Crime interaction. To represent the significant Threat x Crime interaction, Wilks' $\lambda = .65$, F(1, 174) = 92.19, p < .01, $\eta^2 = .35$ [.26, .43], we graphed the fear ratings for the four image categories (see Figure 5.4). The pairwise comparison revealed that when images were low in threat (i.e., crime-only or neutral images), participants' fear ratings were higher for high-crime (i.e., crime-only) than low-crime images (i.e., neutral). Conversely, when images were high in threat (i.e., threat-and-crime or threat-only), participants' fear ratings did not significantly differ between high-crime (i.e., threat-and-crime) and low-crime images (i.e., threat-only). Given that this interaction is unrelated to gender, we suggest readers see Noon et al. (2017) for further discussion about this significant interaction.



Figure 5.4. Participants' (N = 176) average fear ratings for the four image categories: neutral (low-threat, low-crime), crime-only (low-threat, high-crime), threat-only (high-threat, low-crime), and threat-and-crime (high-threat, high-crime). Different superscript letters denote significant differences (p < .01).

Exploring the Role of Anxiety and Social Desirability on Fear Ratings

We used independent sample *t*-tests (with a Bonferonni adjustment; .05/4 = .01) to compare men's and women's scores on social desirability bias, anxiety, stranger victimization, and policing satisfaction measures. Men's and women's responses did not significantly differ on any of these measures (see Table 5.1). We ran an ANCOVA to examine whether social desirability and anxiety influenced the role of threat and crime on fear ratings,. In line with Pallant (2013), we did not include other potential co-variates (stranger victimization and policing satisfaction) in the ANCOVA because they were measured after participants responded to the CaTIS.

Table 5.1

	Men $(n = 81)$		Women			п		
Measure	М	SD	M	SD	t	df	value	Cohen's <i>d</i> [95% CI]
Social desirability bias	4.88	2.06	5.06	1.89	0.63	174	.53	0.10 [-0.40, 0.77]
Anxiety	0.92	0.63	1.00	0.74	0.82	174	.41	0.12 [-1.21, 2.92]
Stranger victimization	0.33	0.26	0.25	0.24	1.86	173	.07	0.28 [-0.15, 0.00]
Policing satisfaction	3.24	1.07	3.50	0.87	1.81	173	.07	0.28 [-0.02, 0.55]

Summary of Independent Sample t-test Results for Men's and Women's Scores.

Note. *Degrees of freedom differ because some participants did not complete all measures. Please note that the number of women in the sample decreased from 95 to 93 on account of two participants not completing these scales at the end of the survey.

The overall pattern of results from this ANCOVA was identical to the ANOVA in terms of significant findings and direction of results, with three significant main effects: gender, F(1, 172) = 12.08, p < .01, $\eta^2 = .07$ [.02, .13]; threat, Wilks' $\lambda = .65$, F(1, 172) = 94.74, p < .01, $\eta^2 = .36$ [.26, .44]; and crime, Wilks' $\lambda = .96$, F(1, 172) = 6.55, p = .01, $\eta^2 = .04$ [.00, .09]. We again found significant interactions between gender and threat, Wilks' $\lambda = .92$, F(1, 172) = 15.01, p < .01, $\eta^2 = .08$ [.03, .15], and between threat and crime, Wilks' $\lambda = .96$, F(1, 172) = 6.35, p = .01, $\eta^2 = .04$ [.00, .09]. As in the previous analyses, no other interactions were significant. The covariates did not have significant main effects: anxiety, F(1, 172) = 3.72, p = .06, $\eta^2 = .02$ [.00, .07], social desirability, F(1, 172) = 3.38, p = .07, $\eta^2 = .02$ [.00, .07]; or significantly interact with the independent variables: anxiety (F-values < 0.69 and *p*-values > .41), social desirability (F-values < 3.08 and *p*-values > .08).

Discussion

Our findings replicated the established fear of crime gender paradox using traditional measures (Smith & Torstensson, 1997). Yet, with an innovative tool—the CaTIS—found only limited support for the well-established fear of crime gender paradox (e.g., Carcach & Mukherjee, 1999). Although women did provide significantly higher fear ratings than men to the images overall, the significant Gender x Threat interaction revealed that these gender differences were limited to high-threat, not low-threat, images.

Importantly, the extent to which images were related to crime had no significant effect on the men's and women's fear ratings. This finding supports our competing hypothesis that the gender paradox is primarily driven by differences in how men and women respond to threat rather than crime (Bradley, Codispoti, Sabatinelli, et al. 2001; Gustafsod, 1998; Schmitz & Grillon, 2012). This suggests that relying on traditional fear of crime measures may obscure some of the nuances of the gender paradox; thus, it is critical to use new paradigms to pinpoint the underlying components of men's and women's fear ratings. These results showed that the fear of crime gender paradox is not narrowly and exclusively related to crime, but instead may reflect a broader *fear of threat* gender paradox (Hirtenlehner & Farrall, 2013).

The two potential co-variates of anxiety and social desirability bias did not significantly influence participants' fear ratings nor alter the pattern of results. This is surprising as we had hypothesed that women's high anxiety levels may be driving their higher fear reports (Eaton et al., 2012), and that men's desire to respond in a socially desirable fashion may result in lower fear reports (Sutton & Farrall, 2005). Specifically we again found significant main effects of gender, threat, and crime, significant interactions between gender and threat, and between threat and crime, yet no other significant interaction effects.

Limitations and Future Directions

In the current study, participants viewed static images and self-rated their fear by responding to the statement "This scares me" on a 7-point Likert scale. Fear, however, is a relatively immediate response to threatening stimuli (Lange & James, 1922). Thus, a single statement is unlikely to capture the entireity of physiological, emotional, and behavioural activations imbued in the mammalian fear response. Participants' ratings of images depicting a snake or a darkened alley may differ from their reactions to the same stimuli in real life (such as holding a snake or walking down a darkened alley). In real life, fear responses may also be linked to other emotions such as anger and anxiety (Ditton, Bannister, Gilchrist, & Farrall, 1999; Farrall, 2004; Tulloch, 2003). Although men's and women's CaTIS ratings may not completely capture the scope and scale of their response, using novel methods of this nature can help researchers triangulate and understand the complex factors that influence fear. In the future, the CaTIS could be used in studies that measure reactions to threat and crime in different ways (e.g., physiologically) or that include other rating strategies of emotion.

Researchers using the CaTIS in further studies should remain mindful that threat-only images do not encompass all threats that are not crime-related. Despite efforts to include non-animal threats, participants in the evaluation and validation studies (Noon et al., 2017) rated only animal stimuli to be consistently threatening. The results from this study should be interpreted with this limitation in mind. Future studies may include a clinical measure of more specific phobias (e.g., Phobic Stimuli Response Scale, Cutshall & Watson, 2004) to unpack and control for any phobias.

Biases may also affect reports of emotion (Van de Mortel, 2008), and these biases can be gendered (Asendorpf & Scherer, 1983; Simon & Nath, 2004). In this study the Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds, 2006) was included to rule out the possibility that differences in men's and women's fear ratings reflected a social desirability bias rather than actual differences in fear. Nonetheless, future research with the CaTIS could explore self-report biases empirically by introducing more sophisticated measurement and analysis techniques (e.g., physiological measures). This may shed light on whether men and women experience or simply report—different emotional responses (Fischer, Rodriguez Mosquera, Van Vianen, & Manstead, 2004).

Finally, women do experience more sexual threat and violence than men (ABS, 2014b). If fear of crime reflects a fear of sexual crime on the basis of the shadow of sexual assault thesis (Ferraro, 1996), then there is no paradox. This is because women are at greater risk and, accordingly, report greater fear. We did not explore this specific dynamic as the CaTIS does not include content that is explicitly sex-crime related (on account of ethical considerations and maintaining participant well-being).

Conclusion

We replicated the fear of crime gender paradox using traditional measures (Carcach & Mukherjee, 1999; Smith & Torstensson, 1997). On these measures, women reported higher fear of crime and lower perceptions of safety than men. Their CaTIS ratings, however, told a different story. Women did provide higher fear ratings than men, but this was a response to threatening rather than crime-related images. Further analysis revealed that anxiety and social desirability bias did not influence these findings. This research extends previous findings by using a new image set (the CaTIS) rather than a scale or survey (e.g., Jackson, 2006) to pinpoint factors driving the differences in men's and women's fear ratings. Chapter 6: Paper 3

Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat

Original paper

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Please note that I have made small alterations to this Paper for thesis presentation. These changes were limited to the formatting of margins, line spacing, placement of tables and figures, numbering of tables and figures, unblinding this manuscript, removing all reference lists (which are compiled at the end of the thesis), and altering some in-text citations to align with this compiled list. As no other changes were made, the referencing style and language requested by the *British Journal of Criminology* were retained.

Abstract

To examine the fear of crime gender paradox, we explored how men's and women's emotions were influenced by viewing threatening and/or crime-related images. Participants (N = 427) completed a quasi-experiment with gender, threat (high vs. low), crime (high vs. low), and time (of measure) as independent factors, and quantitative and qualitative measures of emotion as dependent variables. Women who viewed high-threat images reported increased anger and fear and reduced positive affect and satisfaction compared to women who viewed low-threat images and men. Regardless of threat, participants who viewed high-crime (cf. low-crime) images reported increased satisfaction and sense of safety. Overall, people's responses extended beyond fear; and threat, not crime, produced gender differences.

Key words. fear of crime, gender differences, gender paradox, emotions, affective reactions, Crime and Threat Image Set

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Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat

Gender is one of the strongest predictors of fear of crime levels, with women consistently reporting higher fear of crime than men (Jackson 2009; Warr 2000). This presents a paradox because men have a higher risk of stranger victimisation than women (Australian Bureau of Statistics [ABS] 2014b; Carcach and Mukherjee 1999; Warr 1985), indicating a counter-intuitive relationship between risk and fear. Researchers have observed this fear of crime gender paradox across time (Haynie 1998) and cultures (Bennett and Flavin 1994; Brown 2016). In this study, we explored how men's and women's emotions changed in response to viewing images that were threatening and/or crime-related. We measured a range of emotions to provide new insights into the gender paradox.

Measuring Fear of Crime

How we measure fear is a critical issue to understanding fear of crime and its gender paradox because "our understanding of the fear of crime is a product of the way it has been researched rather than the way it is" (Farrall, Bannister, Ditton and Gilchrist 1997: 658). Despite attempts to improve fear of crime self-report measures (Jackson 2006), as well as develop awareness of the construct's complexity (Farrall and Gadd 2004; Lee 2018), there is still uncertainty as to what participants are reflecting on when they provide their responses. As such, the exact construct being measured by traditional fear of crime measures is elusive (Gabriel and Greve 2003; Warr 2000).

Traditional fear of crime measurement strategies. Generally, researchers (e.g., Jackson 2006) and governments (e.g., the Australian Personal Safety Survey; the Crime Survey of England and Wales) use large-scale surveys to measure fear of crime. In Australia, as an example, almost 30,000 people are interviewed over the phone annually to determine their experiences of victimisation as well as how safe they feel when alone during the day and at night in different settings (ABS 2014a). In other surveys, questions (items) have changed over the last 40 years from having a binary yes/no structure, to Likert-scale responses (Henson and Reyns 2015). Such items might reference being worried or afraid, ask for general predictions of how respondents would behave, or require them to make assessments of risk (Gabriel and Greve 2003; Gray, Jackson and Farrall 2011; Hough 2004).

The construct being measured. Ferraro (1995) defined fear of crime as "an emotional response of dread or anxiety to crime or symbols that a person associates with crime" (4). We can guess that the term "fear of crime" was introduced because fear is an emotional response to threat (Steimer 2002) and criminal victimisation can be life-threatening or life-ending. Although the term fear of crime has become synonymous with community and individual reactions to criminal threat (Dolan and Peasgood 2007; Hale 1996; Warr 2000), it may be misleading (Jackson 2006; 2009) because traditional fear of crime measures do not always include items that relate to fear specifically or emotions generally (Ferraro and Grange 1987; Gray, Jackson and Farrall 2011; Rader 2004). To understand how survey items may not directly reference fear or emotions, we must unpack what these constructs mean psychologically (Gabriel and Greve 2003).

Fear and other emotions. Fear—like anger, disgust, happiness, sadness, and surprise—is considered a basic, adaptive, and universal emotion (Ekman 1992). Each of these basic emotions are quick to emerge, briefly experienced, occur in response to stimuli (whether internal or external; real, imagined, or assumed), are distinct from each other, and differ from complex emotions (e.g., shame, worry) that are more cognitive in nature (Clark 2010; Lazarus 1982; Spielberger 2010).

Traditional fear of crime measures and items (e.g., Jackson 2006; Ferraro and Grange 1987) may capture a greater emotional range than fear alone, yet the specific emotions being measured are unclear (Gray, Jackson and Farrall 2011; Hough 2004; Warr 2000). When participants have been asked to elaborate on their feelings about crime they have reported diverse emotional reactions including anger (Farrall 2004; Tulloch 2003). Although anger and fear may both be reasonable reactions to the threat of stranger victimisation, they are psychologically distinct emotions (Olatunji, Ciesielski and Tolin 2010) differing across dimensions of certainty (anger is certain, and fear is uncertain) and control (anger is about individual control and fear is about situational control; Lerner and Keltner, 2001). This suggests that fear of crime measures may detect a more diverse array of emotions than fear as it is strictly defined.

Emotions and cognitions. Emotions are distinct from cognitions in terms of brain activation, as well as their psychological purpose and function (Pessoa 2009). Fear of crime researchers may have been examining cognition rather than emotion (Gabriel and Greve 2003; Gray, Jackson and Farrall 2008a; Hinkle 2015) because participants are required to make cognitive appraisals to respond to the measures (Farrall, Jackson

and Gray 2006; Holloway and Jefferson,1997). Responding to typical fear of crime items requires the retrieval of complex memories, hypothetical predictions and/or abstract evaluations (Jackson 2006), all of which require cognitive processing (Eichenbaum 2001; Kang, Rangel, Camus and Camerer 2011). Despite efforts to apply psychological theories and cognitive, affective, and behavioural distinctions to fear of crime (Gabriel and Greve 2003; Jackson 2009), there has been little practical application of these theoretical discussions (Gray, Jackson and Farrall 2008a).

The issue of measuring cognitions rather than emotions is more than a function of item wording (Scherer 2005) because there are various limitations to measuring emotion after it has been experienced. When being surveyed, participants are required to either remember or hypothesize, and both have cognitive implications. These methods could also activate gender stereotypical responses (Francis, Dugas and Ricard 2016; Robinson, Johnson and Shields 1998). In addition, interview and focus group methods require participants to interact with the interviewer (Bryman 1988), a process that is not blind to gendered interactions and the potential activation of gender stereotypes (Campbell-Kibler 2010; Strand 1999). This is an important consideration given the gender dynamics of fear of crime.

The Gender Dynamics of Fear of Crime

One of the most consistent findings in the fear of crime literature is the observation that women report more fear of crime than men (Jackson 2009; Warr 2000). This is curious because men experience greater rates of stranger victimisation than women (Heimer and Lauritsen 2008). The major explanations for the oft-cited fear of crime gender paradox focus on women's higher fear, men's lower fear of crime, and gender differences in reporting.

Women's fear of crime. There are several possible explanations of women's higher levels of fear of crime. One is that women's unrecorded victimization and harassment experiences underpin their fear (Broll 2014; Lupton 1999b; Sironi and Bonazzi 2016). Women experience underreported violence in the home (Flood and Fergus 2008), as well as harassment outside of the home (Lupton 1999b), that may contribute to beliefs about the danger that strangers pose (Smith and Torstensson 1997) and engender a sense of constant threat (Junger 1987). A second explanation is that women may couple the possibility of certain crimes, such as a home invasion, with the likelihood of sexual assault (Ferraro 1996; Özaşçılar 2013; Warr 1985) or physical harm

(Hirtenlehner and Farrall 2014). A third possibility is that women receive more frequent warnings about their vulnerability than men (De Groof 2008; Hollander and Rodgers 2014; Katz 2013), which may lead women to presume that they are at a greater risk of victimization than men (Burt and Estep 1981; Dobbs, Waid and Shelley 2009). Taken together, women's fear of crime reports are likely to be informed by a social context that includes experiences of unrecorded victimization and reinforced messages regarding vulnerability.

There is also evidence that women and men respond differently to threats that are not crime related. Women are over-represented in diagnoses of disorders that feature heightened threat responses and fear reactions (e.g., specific phobia, generalised anxiety, social anxiety, panic disorder, agoraphobia, and nightmare disorder; American Psychiatric Association [APA] 2013; Eaton et al. 2012). Regarding animal phobias (Carretié et al. 2009), women report symptoms at two to three times the rate of men (Fredrikson, Annas, Fischer and Wik 1996). In non-clinical populations, women and men perceive risk differently: women worry more and consider health and safety risks more than men (Gustafsod 1998). The startle response—a defensive reaction to perceived threat—may also be more prominent in women than men (Schmitz and Grillon 2012), and women may be more aware than men of objects that activate this startle response (known as risk sensitivity; Mesch 2000; Warr 2000). This is not to suggest that women are always fearful and that men are always fearless, but that women are generally more anxious and fearful than men, and not only in relation to crime.

Men's fear of crime. Masculine ideals promote emotional restraint (McLean and Anderson 2009), a stereotype of fearlessness (Goodey 1997), and beliefs of personal autonomy and self-confidence (Grabosky 1995) that may reduce fear of victimization. The tendency of some men to view crime as an opportunity to be assertive (Gilchrist, Bannister, Ditton and Farrall 1998; Tulloch 2003) may also reduce their fear or, at least, their reports of fear. Thus, men's lower fear of crime reports may be a result of their wanting to respond in a stereotypical fashion (Robinson, Johnson and Shields 1998; Smith and Torstensson 1997), which may lead men to underreport their fear in general (e.g., Asendorpf and Scherer 1983), and their fear of crime specifically (Sutton and Farrall 2005).

Men's and women's reporting differences. Gender differences may be a result of reporting differences and biases (specifically, men minimising their anxieties, Hale

1996; Smith and Torstensson 1997) rather than reflect people's lived experiences of fear (Jackson 2004). It is possible that men and women experience similar levels of fear of crime, but that women may be more willing to report this fear than men. When fear of crime was reconceptualised to include anger about crime, men's and women's reporting rates were not dissimilar (Ditton, Bannister, Gilchrist and Farrall 1999), perhaps because it is more socially acceptable for women to espouse fear and men to espouse anger (McLean and Anderson 2009). This shifts the focus from women's over-attendance to threat to men's underreporting of fear (Simon and Nath 2004) and suggests that the way we measure fear of crime is a central issue to how we understand the fear of crime gender paradox.

In summary, men and women respond differently to traditional fear of crime measures; however, their responses may reflect their fear, anger, or some other emotion. Moreover, questions remain as to whether traditional fear of crime measures tap into emotions at all.

Alternatives to Traditional Measures

To further researchers' ability to explore fear of crime, Noon, Beaudry and Knowles (2017) created, evaluated, and validated the Crime and Threat Image Set (CaTIS). The CaTIS contains 80 images that differ in terms of threat (high vs. low) and crime (high vs. low). This set contains four separate categories: threat-and-crime images (high-threat and high-crime), threat-only images (high-threat and low-crime), crimeonly images (low-threat and high-crime), and neutral images (low-threat and lowcrime). In a follow up analysis, Noon, Beaudry and Knowles (under review) found that women reported more fear towards the CaTIS images than men, and that women's fear was driven by threatening not crime-related images.

The Current Study

To explore the broad range of emotions that men and women report in response to threat and crime, we looked at how viewing the CaTIS informed broader emotional states. We used well validated and reliable psychological measures (e.g., the Positive and Negative Affect Schedule [PANAS], Crawford and Henry 2004) and asked participants to complete a series of measures both before and after viewing CaTIS images. We were also interested in how participants spontaneously reacted to the CaTIS images when not limited by forced response questions; thus, we provided an opportunity for participants to write their spontaneous reactions as they viewed the CaTIS images (Fritz 2015).

Our two key research questions were: Does viewing the CaTIS change men's and women's emotions? What kinds of images influence changes in emotional states? We hypothesised that women would report more negative emotions and emotional arousal than men (Fischer et al. 2004), particularly in response to threat (Noon et al. 2017). In response to crime, we predicted that women would report more fear and less anger than men (Ditton et al. 1999). Based on the principle of consistency (Cialdini 2009) we expected men's and women's qualitative reactions to images would mimic their quantitative ratings.

Method

Participants

We recruited a convenience sample of 456 participants from on-campus and online first-year psychology and criminology courses at an Australian University. Participants completed the online study in exchange for course credit. We removed data provided by 29 participants who did not complete the entire study. Our final sample (N = 427) consisted of men (n = 195) and women (n = 232) who ranged in age from 18 to 63 years (M = 33.08, SD = 10.65). Most participants were Australian-born (83%), and almost all (97%) resided in Australia at the time of the survey. Women predominantly reported being educated to a diploma level (45%), and men to a secondary school level (42%). About a quarter of participants reported holding no current employment (26%), 34% worked part-time, and 40% worked full-time.

Design

We used a 2 (Gender: men vs. women) x 2 (Threat images: high vs. low) x 2 (Crime images: high vs. low) x 2 (Time: pre vs. post image exposure) mixed-factorial design. Gender was a self-identified between-subjects factor. Threat and crime were between-subjects manipulations. Threat refers to whether participants viewed CaTIS images that were threatening (high) or not (low), and crime refers to whether participants viewed CaTIS images that were crime-related (high) or not (low). Time was a repeated measure and refers to whether the dependent variables were measured before participants viewed the images (pre) or after participants viewed the images (post). The quantitative dependent variables included nine emotional content reports: positive affect, sadness, anger, fear, pleasure, satisfaction, control, arousal, and sense of safety.

Further dependent variables relating to the emotional content of language were measured by a question that required an open-ended, qualitative response.

Materials

CaTIS images. The CaTIS consists of 80 images that have been evaluated and validated across the two dimensions of threat and crime, with each image categorized as either high-threat or low-threat and high-crime or low-crime (Noon et al. 2017). Thus, the CaTIS contains four categories of 20 images: threat-and-crime (high-threat and high-crime; e.g., a riot), threat-only (high-threat and low-crime; e.g., a shark), crime-only (low-threat and high-crime; e.g., a person shoplifting), and neutral (low-threat and low-crime; e.g., a table). See Figure 6.1 for further examples.



Figure 6.1. Sample images from each CaTIS (Noon et al., 2017) image category. Originally published in the *Journal of Experimental Criminology*.

Practice images. We included an additional two neutral images from the Geneva Affective Pictures Database (GAPED; Dan-Glauser and Scherer 2011) to provide participants with a practice before engaging in the qualitative task.

Measures. We used quantitative, qualitative, and other measures.

Quantitative measures. We used a variety of quantitative measures to assess traditional fear of crime responses as well as more general reports of emotion. More information on each of the measures is included in Table 6.1. All Cronbach α coefficients indicated sufficient internal consistency (recommended $\alpha > .70$; DeVellis 2012). We also included demographic questions regarding age, gender, postcode, country of birth, country of current residence, education level, and current employment status.

Table 6.1

Reported fear of crime measures and quantitative reports of emotion scales and items

						Cronb coeff	oach α icient			
		Variable		Full		Item response	Score	Pre	Post	
Scale	Reference	name	Example item	scale	Analysed	options	range ¹	images	images	
Traditional fear of crime measures										
Perceptions of Safety	ABS (2014a)	perceptions	"Please indicate how safe you	11	9	1 (very unsafe) to 5	1–5	n/a	.89	
Measure		of safety	feel when at home alone,			(very safe)				
			during the day"							
Fear of Crime Measure	Jackson (2006) ²	crime worry	"How often have you worried	20	5	0 (not once in the	0–3	n/a	.83	
			about [being attacked by a			<i>last month</i>) to 3				
			stranger in the street] in the			(every day)				
			last month?"							
			Quantitative reports of em	otion						
Positive and Negative	Hepler and Albarracin (2013)	positive	"I feel alert"	19	19	1 (<i>not at all</i>) to 7	1–7	.95	.96	
Affect Schedule		affect				(extremely)				
(PANAS) Modified		negative	"I feel scared"	21	21	1 (<i>not at all</i>) to 7	1–7	.94	.94	
		affect				(extremely)				
PANAS-Expanded	Salas, Radovic, and Turnbull (2012)	joy	"I feel joyful"	3	3	1 (<i>not at all</i>) to 7	1–7	.85	.86	
Version–Short Form						(extremely)				
		sadness	"I feel sad"	3	3	1 (<i>not at all</i>) to 7	1–7	.84	.80	
						(extremely)				
		anger	"I feel hostile"	3	3	1 (<i>not at all</i>) to 7	1 - 7	.82	82	
						(extremely)				
		fear	"I feel afraid"	3	3	1 (<i>not at all</i>) to 7	1–7	.83	.87	
						(extremely)				
Perceived Threat and	Carlton-Ford,	sense of	"How would you rate your	5	5	1 (<i>poor</i>) to 4	1–4	.79	.83	
Safety Measure	Ender, and	safety	personal safety"			(excellent)				
	Tabatabal (2008)									

Cont.

						Number of items		G	Cronl coeff	bach α icient
Seele	Defense	Variable		E		used and	Itom manage antions	Score	Pre	Post
Scale	Reference	name		Example item	• • • • • • • • • • • • • • • • • • •	anarysed	item response options	range	images	images
Affect Grid	Russell, Weiss, and Mendelsohn (1989)	pleasure arousal	STRESS		EXCITEMENT EXCITEMENT EXTREMELY PLEASANT FEELINGS	ont.) 1	Single click on grid, measured from 1 (extremely unpleasant feelings) to 9 (extremely pleasant feelings) Single click on grid measured from 1 (extreme sleepiness) to 9 (extremely high arousal)	1–9 1–9	n/a n/a	n/a n/a
Geneva Emotions Wheel	Scherer (2005); Scherer, Shuman Fontaine, and Soriano (2013)	satisfaction	H Contempt Disgust Fear Disappointment Shame Regret Gi	Anger Interest ate Am	usement Pride Joy Pleasure Contentment Love Admiration	1	Single click on wheel measured from 100 (left) to 690 (right) ² Single click on wheel measured from 30 (bottom) to 520 (top) ³	1–7 3–6	n/a n/a	n/a n/a

¹Each score was calculated by taking the average of the relevant items. ²We did included Jackson's (2006) 20-item scale but analysed only the crime worry sub-scale because these items more directly assessed affective reactions. ³Qualtrics output calculates a co-ordinate score based on the pixel location of the participant's single click. We divided this score by 100 for ease of interpretation.

Qualitative measure. We presented an open-ended statement to capture participants' immediate responses to the images: "Write anything that comes to mind from viewing this image. Stop writing when you feel you are no longer being spontaneous." This instruction was based on the method in Sutherland, Young, Mootz and Oldmeadow (2015) and on the principles of protocol analysis where participants are encouraged to "think aloud" (Gilhooly and Green 1996).

Other measures. We included additional measures, but analyses based on these measures are beyond the scope of this paper and, thus, are not reported. These included two measures of social desirability: Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds, 2006), and the Balanced Inventory of Desirable Responding (Paulhus 1988 in Paulhus and Reid 1991); two measures of gender identity: the Sex Role Identity Scale (Storms 1979) and the Personal Attributes Questionnaire (Spence, Helmreich and Stapp 1975); the Severity Measure for Generalised Anxiety Disorder (GAD) – Adult (American Psychiatric Association 2013); a measure of Policing Satisfaction (ABS 2014a); and a measure of Stranger Victimisation (Noon et al. 2017). More information on each measure and the associated results are available from the first author.

Positive mood induction. We used Velten's (1968) Positive Mood Induction Procedure (MIP) to support participant wellbeing and correct for any negative moods induced by participation in the study.

Procedure

We used Qualtrics software (http://www.qualtrics.com) to present the online study. Participants provided informed consent, answered demographic questions, and completed the social desirability, anxiety, and gender identity measures. Participants next completed the report of emotion measures (PANAS Modified, PANAS-Expanded Version-Short Form, Affect Grid, Geneva Emotions Wheel) and sense of safety (Perceived Threat and Safety) measure for the first time (pre image exposure). Qualtrics software randomly assigned participants to one of the four image conditions (threat-andcrime, threat-only, crime-only, or neutral). Participants were informed that they would view images and be asked to respond to the same statements for each image presented. Two practice images were shown first to all participants, and these were followed by the 20 images from the randomly-assigned condition. Images were shown individually and in random order. We programmed the images with the same overall dimensions (480 x 640 pixels). The qualitative measure was positioned under the image with a text box. This text box had no word limit and the image remained on the screen until the participant advanced to the next page. If participants left the text box blank they were prompted to write something. After viewing the 20 images, participants completed the report of emotion measures and sense of safety measure for the second time (post image exposure). Participants then completed the traditional fear of crime (Fear of Crime, Perceptions of Safety), stranger victimization, and policing satisfaction measures. Finally, participants completed the positive mood induction task and read the debriefing statement. Participants took approximately 60 minutes to complete the study.

Results

We first report the quantitative then qualitative data.

Quantitative Data

After cleaning the data, we used IBM SPSS Statistics Version 23 for all quantitative analyses. We report the marginal mean (*MM*) and standard error (*SE*) when comparing responses from participants assigned to the high or low conditions for threat and crime (i.e., group-based data). As in Noon et al. (2017), *high-threat* refers to responses from participants assigned to either the threat-and-crime or threat-only image conditions, whereas *low-threat* refers to responses from participants assigned to either the threat-and-crime refers to the responses from participants assigned to either the threat-and-crime refers to the responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-and-crime and crime-only image conditions, whereas *low-crime* refers to responses from participants assigned to either the threat-only and neutral image conditions (see Figure 6.1). This allows us to compare participants' reactions to high-threat vs. low-threat, and high-crime vs. low-crime images.

Differences in men's and women's traditional fear of crime reports. We used independent sample *t*-tests to compare men's and women's perceptions of safety and crime worry. The results were consistent with the literature (e.g., Warr 2000): men reported significantly higher perceptions of safety (M = 3.84, SD = 0.65) than women (M = 3.36, SD = 0.67), *t* (424) = 7.52, *p* < .01, *d* = 0.73 [0.53, 0.93]; and women reported significantly higher crime worry (M = 1.56, SD = 0.57) than men (M = 1.39, SD = 0.46), *t* (424) = 3.35, *p* < .01, *d* = 0.33 [0.13, 0.52].

Correlations between emotion measures. To ensure that a MANOVA was appropriate (Pallant 2015), we correlated the 11 potential dependent variables as

measured before participants viewed the images. We report only statistically significant correlations. Positive affect and joy were highly correlated, r (427) = .89, p < .01. We excluded joy and retained positive affect in further analysis because positive affect captured a broad range of positive emotions. Negative affect was moderately to highly correlated with sadness, r (427) = .76, p < .01, anger, r (427) = .72, p < .01, and fear, r (427) = .80, p < .01. We decided to retain the separate sub-scales of sadness, anger, and fear rather than negative affect because differentiating between these negative emotions is particularly relevant to understanding fear of crime (e.g., Ditton et al. 1999).

Investigating the influence of gender, threat, and crime on emotion measures. For the main analysis, we conducted a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) x 2 (Time: pre vs. post image exposure) repeated-measures mixed MANOVA on participants' reported emotions across the nine selected dependent variables (positive affect, sadness, anger, fear, pleasure, satisfaction, control, arousal, and sense of safety). The MANOVA results are reported in Table 6.2 with the univariate results for the significant multivariate effects. We report these significant univariate results to a Bonferroni adjusted α level of .006 (.05/9).

Table 6.2

	Multivariate results				Associated univariate results, p value								
Effects	Wilks' λ	F (9, 357)	<i>p</i> value	${\eta_p}^2$	Positive affect	Sadness	Anger	Fear	Pleasure	Satisfaction	Control	Arousal	Sense of safety
Main effects													
Gender	.96	1.71	.09	.04	-	-	-	-	-	-	-	-	-
Threat	.92	3.43	<.01	.08	-	-	<.001	<.001	-	-	-	-	-
Crime	.96	1.70	.09	.04	-	-	-	-	-	-	-	-	-
Time	.53	35.10	<.01	.47	<.001	-	<.001	<.001	<.001	< .001	-	<.001	< .001
Two-way interactions													
Gender x Threat	.98	0.78	.64	.02	-	-	-	-	-	-	-	-	-
Gender x Crime	.98	0.85	.57	.02	-	-	-	-	-	-	-	-	-
Gender x Time	.93	2.85	<.01	.07	.001	-	<.001	.003	-	.001	-	-	-
Threat x Crime	.96	1.64	.10	.04	-	-	-	-	-	-	-	-	-
Threat x Time	.87	5.79	<.01	.13	-	<.001	<.001	<.001	-	< .001	-	<.001	-
Crime x Time	.83	8.33	<.01	.17	-	<.001	<.001	-	-	.001	-	-	0.003
Three-way interactions													
Gender x Threat x Crime	.98	0.84	.58	.02	-	-	-	-	-	-	-	-	-
Gender x Threat x Time	.94	2.64	<.01	.06	.001	-	.001	<.001	-	.006	-	-	-
Gender x Crime x Time	.98	0.84	.59	.02	-			-	-	-	-	-	-
Threat x Crime x Time	.96	1.74	.08	.04	-	-	-	-	-	-	-	-	-
Four-way interaction													
Gender x Threat x Crime x Time	.98	0.77	.65	.02	-	_	-	-	-	-	-	_	_

Results of four-way MANOVA examining how gender, threat, and crime influence reports of emotion from base-line to after viewing images

Note. We only report significant univariate results to a Bonferroni adjusted α level of p < .006. The highest order multi-variate interactions are highlighted in bold, and the dependent variable is highlighted in bold in its highest order significant interaction or main effect row. Degrees of freedom for all univariate tests (1, 365).
Table 6.2 shows there was a significant main effect of time where viewing the CaTIS images changed participants' reports across seven of the nine dependent variables. The only change not explained by significant higher order interaction effects was for pleasure. All participants reported significantly more pleasure before viewing images (M = 2.09, SD = 5.91) than after viewing the images (M = 1.84, SD = 6.16). There was also a significant main effect of threat; however, these univariate results can be explained by a higher order interaction. We found significant Gender x Time, Threat x Time, Crime x Time, and Gender x Threat x Time interactions. As illustrated in Table 6.2, we have highlighted in bold the highest order interaction effect for the relevant independent variables (e.g., although Gender x Time and Threat x Time interaction). We have also highlighted in bold the dependent variables influenced by these interactions (e.g., the Threat x Time interaction significantly affected arousal, and arousal ratings were not involved in further higher order interaction effects).

The Gender x Time interaction. We do not report on the Gender x Time interaction because all significant univariate results are explained by the higher order Gender x Threat x Time interaction.

The Threat x Time interaction. We found that the Threat x Time interaction influenced arousal and sadness ratings. For arousal ratings, there were no significant differences between groups before participants viewed the high-threat (MM = 4.53, SE = 0.15) or low-threat images (MM = 4.62, SE = 0.15). After participants viewed the images, those who viewed high-threat images reported more arousal (MM = 5.44, SE = 0.15) than those who viewed low-threat images (MM = 4.53, SE = 0.15). For sadness ratings, there were no significant differences between groups before participants viewed the high-threat (MM = 2.26, SE = 0.11) or low-threat images (MM = 2.34, SE = 0.11). After participants viewed the images, those who viewed the images, those who viewed high-threat images (MM = 2.34, SE = 0.11). After participants viewed the images, those who viewed high-threat images reported more sadness (MM = 2.65, SE = 0.11) than those who viewed low-threat images (MM = 2.22, SE = 0.11).

The Crime x Time interaction. As reported in Table 6.2, there were significant differences in participants' reports of sadness, anger, satisfaction, and sense of safety for those who viewed high-crime images compared to those who viewed low-crime images. To represent the significant differences graphically and simplify the analysis, we subtracted the pre image exposure reports from the post image exposure reports for

sadness, anger, satisfaction, and sense of safety. Figure 6.2 shows that participants who viewed high-crime images reported greater increases in their sadness and anger, and greater decreases in their satisfaction and sense of safety when compared to those participants who viewed low-crime images. Note that satisfaction and anger were also included in higher order interactions.



Figure 6.2. Crime x Time interaction graph for quantitative reports of emotion, with differences in the reports of emotion before (pre) to after (post) viewing low- or high-crime images across the four significant dependent variables as determined by the MANOVA. Each pairing is significantly different to p < .006, as reported in Table 6.2.

The Gender x Threat x Time interaction. As reported in Table 6.2, we found a significant three-way Gender x Threat x Time interaction. To explore this further, we ran a follow-up MANOVA with the dependent variable of pre image exposure scores subtracted from the post image exposure scores for positive affect, anger, fear, and satisfaction. As shown in Figure 6.3, women who viewed high-threat images reported greater increases in fear and anger and greater decreases in positive affect and satisfaction than women who viewed low-threat images or men regardless of threat condition. Means for the latter three conditions did not significantly differ.



Figure 6.3. Gender x Threat x Time interaction graph for quantitative reports of emotion, with differences in men's and women's reports of emotion from before (pre) to after (post) viewing low- or high-threat images. Asterisks denote significant differences (p < .006) between these means within the variable category.

Qualitative Results

We used the Linguistics Inquiry and Word Count software (LIWC, http://liwc.wpengine.com 2015) to analyse the words participants wrote as they viewed images. The software calculates the percentage of words within a qualitative data set that align with 93 scales (e.g., percentage of negative emotion words in the total set). We analysed five relevant sub-scales (dependent variables) related to emotion: negative emotion words, positive emotion words, sad words, anger words, and fear words.

We conducted a three-way MANOVA to explore how gender, threat, and crime influenced participants' use of emotional words. The independent variable of time is not relevant to these data because participants provided written reports only while viewing images. We report these significant univariate results to a Bonferroni adjusted α level of .01 (.05/5).

Table 6.3

	Multivariate results				Associated univariate results, p value					
Effects	Wilks' λ	<i>F</i> (5, 415)	p value	${\eta_p}^2$	Positive emotion words	Negative emotion words	Sad words	Anger words	Fear words	
Main effects										
Gender	.96	3.1	<.01	.04	-	-	-	-	<.01	
Threat	.75	27.69	<.01	.25	-	< .01	-	< .01	< .01	
Crime	.85	14.28	<.01	.15	-	< .01	-	<.01	< .01	
Two-way interactions										
Gender x Threat	.98	1.76	.12	.02	-	-	-	-	-	
Gender x Crime	.98	1.82	11	.02	-	-	-	-	-	
Threat x Crime	.82	18.52	<.01	.18	< .01	-	<.01	-	<.01	
Three-way interactions										
Gender x Threat x Crime	.98	1.78	.12	.02	-	-	-	-	-	

Results of three-way MANOVA examining how gender, threat, and crime influence participants' written emotional reports

Note. We only report univariate results to a Bonferroni adjusted α level of .01, and only for significant multivariate effects to p < .05. The highest order multi-variate interactions are highlighted in bold, and the dependent variable is highlighted in bold in its highest order significant interaction or main effect row. Degrees of freedom for all univariate tests (1, 419).

As reported in Table 6.3, there was a significant main effect of gender where women (M = 3.28, SD = 5.08) wrote more fear words than men (M = 2.23, SD = 5.23). There were main effects of threat and crime which should be interpreted within the significant two-way Threat x Crime interaction. We investigated this interaction further with a MANOVA.

The Threat x Crime interaction. We ran a one-way MANOVA with a combined group variable as the independent variable to observe group differences that may be concealed by the Threat x Crime interaction effect. Specifically, we compared participants' responses across the different image categories (threat-and-crime, threatonly, crime-only, and neutral) for the dependent variables of positive emotion words, sad words, and fear words (see Figure 6.4). For positive words, participants in the crime-only and threat-only conditions reported significantly more positive emotion words than those in the neutral and threat-and-crime conditions. For sad words, participants in the threat-and-crime condition wrote the greatest percentage of sad words, and significantly more sad words than in the threat-only and crime-only conditions, but not the neutral condition. Those in the threat-only condition wrote the lowest percentage of sad words, and this was significantly lower than the other categories. For the fear words, participants in the threat-and-crime condition wrote significantly more fear words, and those in the neutral condition wrote significantly fewer fear words, than participants in the other conditions (which did not significantly differ).



Figure 6.4. Threat x Crime interaction graph for qualitative responses, indicating differences in the percentage of emotional words used by participants reacting to different images. Different subscript letters denote significant differences (p < .01) within the variable category.

Discussion

Criminologists have called for more precise measurement of people's emotional reactions to crime (Farrall 2004; Gabriel and Greve 2003; Warr 2000). We heeded the call by using a set of psychometrically validated tools to garner participants' emotional reactions to the crime and threat stimulus set (the CaTIS). We used a quasi-experimental design to examine how threat and/or crime affect men's and women's broad array of emotions and explore whether this provided new insights into the fear of crime gender paradox. Our results demonstrated more diverse emotional reactions than only fear, and found reactions to threat rather than crime drove gender differences.

In our study, the traditional fear of crime measures showed that women expressed more fear of crime and that men expressed higher perceptions of safety, which is consistent with previous research with community samples (Brown 2016; Cops and Pleysier 2011; Warr 2000). Regarding high-threat images specifically, we hypothesised that women would report more negative emotions and emotional arousal than men (Fischer et al. 2004). This was partially supported: men and women both reported more arousal after viewing high-threat images than before. However, as expected, women who viewed high-threat images reported greater increases in their anger and fear, and greater decreases in their positive affect and satisfaction, when compared to women who viewed low-threat images and men who viewed any images. Importantly, this interaction was not driven by how crime-related images were, thus limiting support for the assumption that gendered fear responses are a unique reaction to crime.

In response to crime images specifically, we predicted that women would report more fear and less anger than men (Ditton et al. 1999). This hypothesis was not supported. Viewing high-crime images increased both men's and women's reports of sadness and anger, and decreased their satisfaction and sense of safety. This finding differs from the previous literature with traditional measures on two counts: (1) crime did not influence fear reports, and (2) we found no significant differences between men and women.

We predicted that participants' qualitative responses to images would be consistent with the quantitative findings (Cialdini 2009). Thus, we anticipated that women in high-threat conditions would write more words associated with anger and fear than women in low-threat conditions and men in either condition; and that participants in the high-crime conditions would write more words associated with sadness and anger than those in the low-crime conditions. Instead, women used more fear words than men, regardless of the images they viewed. This could partially explain the gender paradox, as women may verbalise more fear than men in various situations (Kamvar and Harris 2009). It is important to note that these momentary responses did not necessarily translate to increased fear across time (as per our quantitative results).

We also observed a significant interaction between threat and crime when analysing qualitative responses. Participants wrote significantly more fear words towards threat-and-crime images, a similar amount of fear words towards threat-only images and crime-only images, and the fewest fear words towards neutral images. This might mean that threat and crime have an additive effect, which then influences participants' responses (Noon et al. 2017). We should also consider that participants wrote significantly more positive emotion words in response to crime-only and threatonly images than the other two categories. It may be that such images aroused feelings of curiosity (as crime-only images may be more ambiguous) or reflections on beauty and awe (as images of a "wild beast" in the threat-only category may promote). It is not possible to tease apart these explanations using the LIWC, but further research could explore these dynamics.

The inconsistencies between the quantitative versus qualitative responses cause us to reflect on the differences between these two approaches. It is hard to determine which measure was gauging emotions more accurately, and there is limited research comparing such methods (Mahoney and Goertz 2006). We could argue that contemporaneous reactions such as the qualitative task allowed participants to more accurately record their lived experience; however, providing a qualitative response may have required greater cognitive appraisal (Durst 1987). We could therefore speculate that assessing mood change using psychometrically validated measures is a more accurate reflection. More research is required to better understand exactly what the variety of responses elicited by different methods might mean. Further, asking participants to write responses may have iteratively informed their quantitative reports through reinforcement (Schwarz, Frey and Kumpf 1980), so we should not consider these measurements independent.

Overall, our results indicate that the fear of crime gender paradox is likely to be driven by threat, not crime, and, when we broaden the emotions being studied, two important dynamics emerge. The first is that gender does not significantly influence men's and women's emotion reports except when they are reacting to threat. Thus, we found support for a fear of threat gender paradox, as opposed to a fear of crime gender paradox. Second, men and women reported diverse emotional reactions to crime, including increased anger and sadness, rather than fear. Reconceptualising "fear" of crime as "anger" about crime, "sadness" about crime, or an "negative emotional (and probably cognitive) response to threat" is less catchy but may well be more apt, appropriate, and accurate.

Limitations and Future Directions

Other fear of crime research benefits from large community samples (e.g., ABS 2014a), whereas this research relied on a sample of university students. Nevertheless, our sample was similar in age and status to an average Australian sample (ABS 2015), and we did replicate the traditional fear of crime findings with our sample. Nonetheless, the generalisability of the results to the general population are unknown. Future work could engage a more representative community sample while using quasi-experimental methods and measures of various emotions to explore causal relationships.

How researchers frame their questions may influence participants' answers (Ditton et al. 1999; Henson and Reyns 2015). In this study, traditional, quantitative, and qualitative measures produced different results with the same participants. This confirms that different methodologies may tap into different constructs, reinforcing the necessity for experimental research to identify these differences. Future research could include methods that do not rely so heavily on participants' self-reports, as these may be susceptible to impression management biases (Robinson, Johnson and Shields 1998; Sutton and Farrall 2005). Alternative strategies may include the use of psychophysiological measures (Castro-Toledo, Perea-Garcia, Bautista-Ortuno and Mitkidis 2017).

The field has been talking about more than fear (Ditton et al. 2005; Gabriel and Greve 2003) and more than crime (Hirtenlehner and Farrall 2013); however, the words and methods researchers use to describe phenomena influence how they are investigated and understood. When we used psychometrically validated measures and strategies, we discovered that the term "fear" of crime may not adequately capture the range of emotional reactions to crime, and that the fear "of crime" gender paradox may be a fear, anger, lowered positive affect, and lowered satisfaction in response to threat—not

crime—gender paradox. Research furthering our understanding of this phenomenon is essential to making recommendations and designing interventions that may curb its negative influence on people's health and wellbeing (Klama and Egan 2011; Stafford, Chandola and Marmot 2007).

Chapter 7: Paper 4

Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime

Original paper

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Please note that I have made small alterations to this Paper for thesis presentation. These changes were limited to the formatting of margins, line spacing, placement of tables and figures, numbering of tables and figures, unblinding this manuscript, removing all reference lists (which are compiled at the end of the thesis), and altering some in-text citations to align with this compiled list. As no other changes were made, the referencing style and language requested by the *Journal of Experimental Criminology* were retained.

Abstract

Objectives

Fear of crime researchers have called for physiological measurement of the fear of crime. To that end, we explored how men and women responded to self-report and physiological measures as they viewed threatening and/or crime-related images.

Method

We used a Gender (men vs. women) x Threat (high vs. low) x Crime (high vs. low) mixed factorial design. Participants (N = 40) viewed two blocks of 40 images from the Crime and Threat Image Set (CaTIS). In one block, participants rated their pleasantness and arousal (self-report). In the second block, we recorded participants' eye blinks and Galvanic Skin Response (GSR; physiological) as they viewed the images. Participants also completed two traditional fear of crime measures.

Results

Women reported significantly more fear of crime than men on traditional measures. There was a gender dynamic for self-reports of pleasantness: women reported feeling less pleasant when viewing high-threat images than did men. Ratings of arousal, eye blink rates, and GSR did not significantly differ between men and women. Women's (but not men's) pleasantness ratings and GSR were significantly and negatively correlated for high-crime images.

Conclusions

We found gender differences between self-report measures, but no statistically significant differences in men's and women's physiological reactions. We did find some correspondence between women's—but not men's—self-reports and physiological reactions. This suggests that gender differences in fear of crime may be a function of self-reporting dynamics rather than physiological activations for men, but not women.

Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime

Introduction

Fear of crime has been defined as our emotional reaction to the threat of criminal victimisation (Ferraro 1995). The influence of this reaction is far reaching: fear of crime affects our physical and mental health (Jackson and Stafford 2009; Klama and Egan 2011; Stafford et al. 2007), our voting behaviours (Schuermans and De Maesschalck 2010), private funds (Anderson 1999), and public resources (Dolan and Peasgood 2007). Researchers generally rely upon self-reports to study fear of crime (Jackson 2006) and have consistently established that women report much higher fear of crime than men (Cops and Pleysier 2011; Jackson 2009; Moore and Shepherd 2007). This presents a paradox because men have a higher risk of stranger victimisation than women (Heimer and Lauritsen 2008). That said, there is limited published research that examines fear of crime using physiological measures (cf. Castro-Toledo et al. 2017; Kim and Kang 2018), and none that explores the related gender dynamics.

Physiological Measures in Fear of Crime Research

There are two major critiques of the fear of crime literature. The first is that fear of crime is poorly defined, and this limits researchers' ability to measure it adequately. The second is that participants' self-reported responses are prone to reporting biases. Here we discuss how physiological measurement can address these critiques and expand our understanding of fear of crime.

The definitional debate. There is an ongoing debate regarding the precise nature and quality of the emotional reaction to victimisation threat (Henson and Reyns 2015). This reaction may not always be fear (Gray et al. 2011; Hough 2009; Warr 2000) but can include anger (Ditton et al. 1999) and sadness (Noon et al. under review). It may not always be emotional, as it can include cognitive appraisals (Hinkle 2015; Hough 2004; Jackson 2009). Despite attempts to improve fear of crime self-report measures, as well as to develop awareness of the complexity of the fear of crime construct (Farrall and Gadd 2004; Jackson 2006), there is still uncertainty as to what experiences, ideas, and emotions participants reflect on when they provide their survey responses. As such, the exact construct(s) being assessed are unclear (Gabriel and Greve 2003; Warr 2000) and fear of crime rates depend on how they are measured (Farrall et al. 1997).

The use of physiological measures may partially side-step the fear of crime definitional debate. Threatening and appetitive stimuli produce similar (Lang 2014) and predictable (Lang and McTeague 2009) activation of the Sympathetic Nervous System (SNS). This activation can be observed through careful measurement of the startle (i.e., increased number of eye blinks; Lang et al. 1990) and endome responses (i.e., higher Galvanic Skin Response [GSR]; Lang 2014). Specifically, participants' blink rate increases when viewing unpleasant (Crombez et al. 1997, Bradley et al. 2008; Vaidyanathan et al. 2009) or threatening images (Benning et al. 2005), such as threatening faces (Haaker et al. 2016). When facing threat, participants also perspire more from the eccrine sweat glands (ESGs) located on their hands and feet (Bradley, Codispoti, Cuthbert, et al. 2001). Eye blinks and GSR are not the only indicators of activated threat response or stress reactions (e.g., Schienle et al. 2005), but these variables can be measured non-invasively and may inform our understanding of threat reactions (Andreassi 2007; Stern et al. 2001).

Impression management effects. The propensity of participants to alter their self-reports-either to protect the image they project to others or to maintain their own self-esteem—is a major limitation of self-report research (Podsakoff et al. 2003). Researchers investigating emotion (e.g., Van de Mortel 2008) and gender (e.g., Asendorpf and Scherer 1983; Pierce and Kilpatrick 1992, in Stoyanova and Hope 2012; Simon and Nath 2004) have examined participants' impression management strategies. Impression management may drive men's lower fear of crime reports because men may minimise their anxieties (Hale 1996; Smith and Torstensson 1997). In key research exploring this theme, Sutton and Farrall (2005) analysed fear of crime data from 288 households where participants had also completed a 12-item lie scale from the Eysenck Personality Questionnaire-Revised (EPQ-R; Barrett and Eysenck 1992 in Sutton and Farrall, 2005). High lie-scale scores were related to decreased fear of crime reports for men (and unrelated to women's scores), suggesting that men's fear may be more private than women's fear. In an extension of this study, Sutton et al. (2010) asked 100 British participants to report their fear of crime and either represent themselves in the best possible light (impression management) or respond honestly. They found that men who were impression managing reported less fear of crime than men asked to respond honestly, and women who were impression managing reported more fear of crime than women asked to respond honestly.

Given their initial findings, Sutton and Farrall (2005) proposed that physiological measures should be used to address self-report limitations and elucidate the relationship between fear of crime and gender. Physiological reactions are more difficult for humans to regulate than self-reports; therefore, it is harder for participants to impression manage their responses (Mauss and Robinson 2009). By examining physiological data in combination with self-reports, we may be able to determine whether results from these measures correspond and if there is a physiological basis for self-report diversity across genders. If fear of crime is a psychological concept (Gabriel and Greve 2003) that has physiological implications (Stafford et al. 2007), it makes sense to also measure these responses physiologically.

Physiological fear of crime research. Despite calls to use physiological measures (Warr 2000; Sutton and Farrall 2005), fear of crime researchers have relied almost exclusively on self-report measures for the past 40 years, but there are notable recent exceptions. Castro-Toledo et al. (2017) monitored participants' (N = 15) heart rates as they walked around a neighbourhood that had been experimentally manipulated to have different levels of street light luminosity. The researchers found that heart rate was significantly higher in low-luminosity than in high-luminosity settings. They interpreted that this increased heart rate indicated that low-luminosity settings were more anxiety provoking. Also, Kim and Kang (2018) compared participants' physiological reactions (electroencephalographic, electrocardiograph [ECG], and GSR) as they viewed street-scape images and blank screens. They found that participants (n =13) who reported high fear of crime on traditional measures had higher GSR when viewing commercial, residential, and natural street-scapes than when viewing blank screens. In contrast, participants (n = 14) who reported low fear of crime on traditional measures had higher GSR when viewing blank screens than when viewing streetscapes. This may indicate that those who reported low fear also experienced less physiological activation than those who reported high fear. These two examples are the only occasions we know of where fear of crime researchers have used physiological measures, with no research to date exploring the fear of crime gender paradox using physiological measures.

In summary, we may be able to better understand the complex cognitive, emotional, and physical underpinnings of fear of crime (Caicedo and Van Beuzekom 2006; McLeod et al. 1986) using multiple measures. Triangulating physiological with self-report measures may assist us in determining drivers of, and explanations for, the fear of crime gender paradox. Using physiological measures may also allow us to circumvent the major limitations of self-report measures.

Men's and Women's Physiological Reactions to Threat

Although there is no research using physiological measures to examine the fear of crime gender paradox, emotion researchers have closely examined whether men's and women's self-reported emotional diversity (e.g., Fischer et al. 2004; Kamvar and Harris 2009) corresponds with their physiological reactions to threat. Some research has established that women experience greater SNS activation when facing stressful or threatening stimuli than men. Specifically, women may display greater GSR (Kemp et al. 2004; Mardaga et al. 2006; Rohrmann et al. 2008), show more facial expressions (Thunberg and Dimberg 2000), and blink more (Sforza et al. 2008) towards unpleasant stimuli (Bianchin and Angrilli 2012) or recalled emotional events (Chentsova-Dutton and Tsai 2007) than men. That said, men may be more physiologically responsive to pleasant images (Greenwald et al. 1989, Sarlo et al. 2005). This evidence suggests that women not only report more emotions but may experience greater physiological activation to threat than men.

Despite these findings, in their reviews McLean and Anderson (2009) and Brody and Hall (2010) argue significant differences in men's and women's self-reports of emotion are often found, but statistically significant differences in men's and women's physiological data are not (e.g., Chaplin et al. 2008; Codispoti et al. 2008; Kelly et al. 2008). Although there is evidence both for correspondence and discrepancy between men's and women's self-reports and physiological reactions, the magnitude of physiological gender differences does not correspond with the consistent, often replicated, and well-established gender differences in self-report studies (Kajantie and Phillips 2006; Kelly et al. 2008; McLean and Anderson 2009).

The Current Study

Despite recommendations from leading scholars to extend fear of crime research to include physiological measures (Sutton and Farrall 2005; Warr 2000), researchers have made minimal progress until recently (Castro-Toledo et al. 2017; Kim and Kang 2018). This might be because physiological threat studies have historically used standardised and validated image sets (e.g., the International Affective Picture System [IAPS], Lang et al. 1999; as used by Bianchin and Angrilli 2012), and there was no such image set for crime until recently. Noon et al. (2017) evaluated and validated a set of images called the Crime and Threat Image Set (CaTIS). The CaTIS includes 80 images that vary across the dimension of threat (high vs. low) and crime (high vs. low). The CaTIS is ideal for use in a physiological study (Noon et al. 2017) and may inform our understanding of the propensity, nature, and drivers of the fear of crime gender paradox by illuminating real-time physiological reactions to threat and crime.

Hypotheses and research questions. We predicted that women would selfreport more fear of crime than men. Specifically, women would report more fear of crime (higher crime worry and lower perceptions of safety) on traditional fear of crime measures compared to men (Cops and Pleysier 2011; Jackson 2009; Moore and Shepherd 2007). Based on previous research (Sutton and Farrall 2005; Sutton et al. 2010) we predicted a significant positive correlation between women's fear of crime reports and desirable responding, and a significant negative correlation between men's fear of crime reports and desirable responding. As well, women would self-report feeling less pleasant and more arousal when viewing either high-threat or high-crime CaTIS images than men. We hypothesised that participants would exhibit enhanced SNS activation (as indicated by increased eye blinks and increased GSR) when viewing high-threat images compared to low-threat images (e.g., Benning et al. 2005; Haaker et al. 2016; Bradley, Codispoti, Cuthbert, et al. 2001).

Given the lack of clarity in the literature regarding the correspondence between men's and women's self-report and physiological reactions, we also investigated two additional research questions: Will there be a difference in men's and women's physiological reactions to threat and/or crime? Will these physiological reactions correlate with self-reports?

Method

Participants

We recruited a convenience sample of 20 men and 20 women (N = 40). Around half of the participants (n = 21) were students in first-year psychology and criminology units at an Australian University who participated in exchange for course credit. The remaining participants (n = 19) were from the general community, and they received reimbursement of \$30AUD. Participants ranged in age from 20 to 61 years (M = 29.40, SD = 10.66). Most participants were Australian born (53%), and almost all (98%) resided in Australia at the time of the survey. Women predominantly had been educated to a secondary school level (45%), and men to an undergraduate level (45%). Women mainly held part-time employment (55%), and men were mainly not employed (65%). **Design**

We used a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) mixed-factorial design. Gender was a self-identified between-subjects factor. Threat and crime were within-subject manipulations, where threat refers to whether participants viewed a CaTIS image categorised as threatening (high) or not (low), and crime refers to whether participants viewed a CaTIS image categorised as crime-related (high) or not (low; Noon et al. 2017). We divided the 80 images into two blocks of 40 images (10 images from each CaTIS category). For each participant, one block of images was used for self-report measures and the other was used with physiological measures. We counterbalanced the order of blocks across participants. We found no order effect, so we collapsed the data across both conditions. The dependent variables included self-reported pleasantness and arousal, as well as physiological recordings of eye blinks and GSR.

Materials

Images. Noon et al. (2017) conducted three studies to evaluate and validate images that varied across the two dimensions of threat (high-threat vs. low-threat) and crime (high-crime vs. low-crime). This process created the Crime and Threat Image Set (CaTIS) with four categories of images: threat-and-crime (high-threat and high-crime; e.g., a riot), threat-only (high-threat and low-crime; e.g., a crocodile), crime-only (low-threat and high-crime; e.g., graffitied wall), and neutral (low-threat and low-crime; e.g., a bookcase). See Figure 7.1 for further examples. In this study we randomly presented the original CaTIS image set of 80 images (20 in each category) to participants; however, we removed data associated with two images which were not validated (see Noon et al. 2017).



Figure 7.1. Sample images from each CaTIS (Noon et al., 2017) image category. Originally published in the *Journal of Experimental Criminology*.

Practice images. We included two additional neutral images from the Geneva Affective Pictures Database (GAPED; Dan-Glauser and Scherer 2011) as practice images so participants could familiarise themselves with the tasks.

Self-reported measure of emotion. The Affect Grid (Russell et al. 1989) is a single-item measure of emotion (see Figure 7.2) suitable for research where participants report their emotions on multiple occasions. Participants click on a 9 x 9 grid to indicate their degree of feeling pleasant from 1 (furthest left line, indicating *extremely unpleasant feelings*) to 10 (furthest right line, indicating *extremely pleasant feelings*); and arousal from 1 (bottom line, indicating to *extreme sleepiness)* to 10 (top line, indicating *extremely high arousal*). There are also anchors in each corner of the grid: top-right (*excitement*), bottom-right (*relaxation*), bottom-left (*depression*), and top-left (*stress*). Pleasantness (also referred to in the literature as valence; Lang et al. 1999) and arousal are considered reliable dimensions by which to quantify emotional reactions (Barrett 1998; Kensinger and Corkin 2004). We provided the prompt, "How does this image make you feel? Provide a response on the grid below by clicking the relevant square."



Figure 7.2. The Affect Grid (Russell et al. 1989)

Physiological recordings. Given our interest in threat and the associated SNS responses (Levenson 2003), we measured eye blinks and GSR in line with previous research (e.g., Bianchin and Angrilli 2012; Bradley, Codispoti, Sabatinelli, et al. 2001; Haaker et al. 2016).

Eye blinks. Changes in the eyes (such as pupil dilation and eye movements) are indicators of SNS activation (Stern et al. 2001). Eye blinks are a suitable and temporally-acute measure of the startle reflex that is activated by threat (Andreassi 2007; Lang et al. 1990). Participants tend to blink more when looking at unpleasant rather than pleasant stimuli (e.g., Bradley et al. 2008; Haaker et al. 2016; Shechner et al. 2015), and these effects are amplified when images are highly arousing (Bradley et al. 1996). We recorded each participant's left eye on video and manually counted the eye blinks (Sforza et al. 2008). We omitted data from six participants due to low quality video (e.g., eye did not appear on screen) or unclear blinking patterns (e.g. eye closed for long periods or excessive eye fluttering), leaving a final sample of 34 for this dependent variable.

To calculate eye blinks, a research assistant (the first rater) watched all videos and counted blinks (i.e., participant's eye went from open to closed and open again). The first author (and second rater) randomly selected and blind coded 8 of the 34 participants' video files. Interrater reliability was 0.93. To resolve discrepancies, the first rater's data were unblinded and each instance of discrepant ratings was reviewed by the second rater. This second rater concluded that the first rater had correctly counted the blinks in each instance. For this reason, the first rater's calculations were used for the analysis.

Galvanic Skin Response (GSR). GSR (our operationalisation of electrodermal activity) is an effective measure of the fight or flight response associated with the SNS activation that occurs in response to threat (Levenson 2003; Lang 2014). Indeed, thousands of physiological studies have examined electrodermal activity as a measure of emotional and cognitive reactions to external stimuli (Bradley, Codispoti, Cuthbert, et al. 2001; Stern et al. 2001).

The hands and feet have ESGs (eccrine sweat glands) that respond acutely to stress rather than temperature changes. We can measure electrodermal activity (GSR, skin conductance) by placing two electrodes on the hands or feet and passing a small constant electrical current between them. If the SNS is activated, more sweat is excreted from the ESGs, causing an increase in electrolytes near the electrodes and greater conductance (as measured by a smaller voltage between the two electrodes; Geddes 1972). The International System of Units (SI) unit for GSR is Siemens, and because of its magnitude, is typically reported as μ S with larger measured GSR (in μ S) indicating greater arousal.

GSR recordings are highly variable between individuals. To control for this we implemented a within-subjects design and used LabChart software. This software calibrates data by accounting for a base-line measurement for each participant. For each participant and each image category, we subtracted the minimum recorded skin conductance from the maximum recorded skin conductance and divided this by the mean recorded skin conductance to determine a normalised skin conductance score.

Self-report fear of crime measures. We included traditional measures of fear of crime. One was Jackson's (2006) Fear of Crime Measure for which the 5-item crime worry sub-scale was of interest (hereafter referred to as crime worry) because this specifically refers to anxiety about becoming a victim of crime by a stranger. In this sub-scale, participants rate five different crime types according to, "how often have you worried about [that crime type] in the last month?" along a scale of *not once in the last month* (0) to *every day* (3). This sub-scale had a Cronbach α coefficient of .74, indicating sufficient internal consistency (recommended $\alpha > .70$; DeVellis 2012). We

averaged the items to create the final crime worry score (range 0–3). We also included the Australian Bureau of Statistics (ABS 2014a) 9-item Perceptions of Safety Measure (hereafter referred to as perceptions of safety) where participants, "indicate how safe [they] feel" in different locations and times of day along a scale from *very unsafe* (1) to *very safe* (5). The scale had a Cronbach α coefficient of .70. We averaged the items to create a final perceptions of safety score (range 1–5).

Desirable responding. We used the 13-item Marlowe-Crowne Social Desirability Scale: Short Version C (Reynolds, 2006) to measure social desirability. This scale had a Cronbach α coefficient of .19, indicating poor internal consistency. For this reason we did not analyse it further. We also used the 20-item impression management sub-scale from the Balanced Inventory of Desirable Responding (BIDR; Paulhus 1988 in Paulhus and Reid 1991), which is positively correlated with the EPQ-R (Davies et al. 1998) used by Sutton and Farrall (2005). This sub-scale had a Cronbach α coefficient of .74 and was therefore suitable to use.

Demographic items. We assessed age, gender, postcode, country of birth, country of current residence, education level, and employment status.

Other measures. We included other self-report (sense of safety, anxiety, gender identity, stranger victimization, and policing satisfaction) and physiological measures (heart rate and respiratory rate) to ascertain whether "noise" variables influenced or explained our results. We detail these measures in our Procedure but do not report on them further because they were not central to our research question. More information on each measure can be found in the Technical Appendix, and the associated results can be requested from the first author.

Positive mood induction. We used Velten's (1968) Positive Mood Induction Procedure (MIP) to counteract the potential negative mood that may have arisen from viewing CaTIS images.

Apparatus

We set up a laboratory with no windows, fluorescent lighting, a desk, two chairs, and two computers: a researcher computer and a participant computer.

Researcher computer set up. This computer ran LabChart software (http://www.adinstruments.com) and was connected to an 8-channel Powerlab 15T preamplifier. To the first channel, we connected a Respiratory Belt Transducer; to the second channel, we connected ECG electrodes; and to the third channel, we connected a GSR amplifier and finger electrode. A common ground mechanism was used for the ECG and GSR measures (Andreassi 2007).

Participant computer set up. This computer ran Qualtrics (http://www.qualtrics.com) and Office PowerPoint software (Microsoft 2015). We placed a video camera on a tripod behind the participants' computer screen to record eye blinks. See Figure 7.3 for the set-up.



Figure 7.3. The set up for the participants' computer, with the Powerlab preamplifier pictured bottom-left.

Procedure

Participants attended a laboratory where they were greeted by the first author, who asked them to complete an online survey on a computer using Qualtrics. First, participants provided informed consent, answered demographic questions, and completed the desirable responding, gender identity, and anxiety measures. Participants also completed the sense of safety measure for the first time.

Then Qualtrics software randomly assigned participants to one of two order conditions (self-report block first or physiological block first). Across both the self-report and physiological blocks, each of the 80 CaTIS images was shown only once to each participant, and each block showed 40 images (10 from each image category).

Each image was displayed individually with a screen resolution of 480 x 640 pixels against a white background.

Self-report block. Participants were informed through instructions on Qualtrics that they would view images and be asked to respond to the Affect Grid for each image. The Affect Grid was positioned under the image and presented at the same time. They viewed a practice image then 40 CaTIS images in random order. Each image appeared on the screen until participants chose to progress to the next screen. When participants had rated all images a screen message instructed them to tell the researcher they were finished.

Physiological block. The researcher set up the physiological apparatus by asking each participant to clean their left inner wrist and left outer ankle with an alcohol wipe. Participants then placed the ECG electrode on each clean patch of skin. The participant was asked to place the Respiratory Belt Transducer just above their waist line (the thorax), and the finger electrodes on their index and ring fingers on the left hand. All signals were checked and sensors or electrodes were adjusted as required. Once this was completed, participants were asked to look at the screen. We used Office PowerPoint (not Qualtrics because internet responsivity in the lab affected the display time of images) to show a practice image then 40 CaTIS images in random order at 6second intervals (precisely 6.009 s or 6009 ms; Bianchin and Angrilli 2012; Lang et al. 1993). We programmed this so that a blank white screen was displayed after each image (also shown for 6.009 s). We used LabChart to record physiological reactions related to heart rate, respiration, and GSR. We video recorded eye blinks (Sforza et al. 2008). After viewing all images, a screen message instructed participants to tell the researcher they were finished. The researcher asked the participant to remove the measurement apparatus, and the researcher re-opened the Qualtrics survey to commence the next component of the study.

Finally, participants reported their sense of safety for a second time. They then completed the fear of crime, stranger victimization, and policing satisfaction measures, and read through the positive mood induction and a debriefing statement. Participants were thanked for their time. The study took participants approximately 60 minutes to complete.

Results

We used IBM SPSS Statistics 24 (SPSS) for all analyses. To calculate Cohen's *d* we used an online calculator for excel (http://www.cem.org/effect-size-calculator), and to calculate η^2 we used Wuensch's (2015) syntax for SPSS. Confidence intervals (95%) are reported in square brackets. We report the marginal mean (*MM*) and standard error (*SE*) when comparing group-based data (Noon et al. 2017).

Men's and Women's Traditional Fear of Crime Reports

We conducted two independent sample *t*-tests to compare men's (n = 20) and women's (n = 20) crime worry and perceptions of safety reports. We used a Bonferroni adjusted *p* value of .03 (.05/2). As predicted, we found that women (M = 1.71, SD =0.52) reported significantly greater crime worry than men (M = 1.33, SD = 0.36), *t* (38) = 2.71, p = .01, d = 0.85 [0.19, 1.48], and that men (M = 3.92, SD = 0.62) reported significantly greater perceptions of safety than women (M = 3.43, SD = 0.61), *t* (38) = 2.55, p = .02, d = 0.80 [0.14, 1.42].

Men's and Women's Impression Management Reports

An independent sample *t*-test revealed that men (M = 6.40, SD = 3.41) and women (M = 6.80, SD = 4.00) did not differ significantly in their impression management scores, t(38) = 0.34, p = .74, d = 0.11 [-0.51, 0.73].

We calculated Pearson product-moment correlation coefficients between traditional fear of crime (crime worry and perceptions of safety) and impression management measures for men and women. In contrast to previous research (e.g., Sutton and Farrall 2005), we found no statistically significant correlations: impression management did not significantly correlate with crime worry for men, r = -.16, n = 20, p= .51, or women , r = -.06, n = 20, p = .82; nor did impression management significantly correlate with perceptions of safety for men, r = .37, n = 20, p = .11, or women, r = .14, n = 20, p = .55.

Effects of Gender, Threat, and Crime on Self-Reports of Emotion

We conducted two separate 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) mixed ANOVAs on participants' reports of pleasantness and arousal as they viewed CaTIS images. We also graphed these means against the grid for a visual representation (see Figure 7.4).



Figure 7.4. Participants' (N = 40) mean affect grid scores for each image category. Black dots indicate overall means, X indicates women's (n = 20) mean scores, and Y indicates men's (n = 20) mean scores.

Pleasantness reports. For pleasantness reports we found a main effect of crime. Participants reported feeling significantly more unpleasant when viewing high-crime (MM = 4.15, SE = 0.16) than low-crime images (MM = 5.30, SE = 0.16), Wilks' $\lambda = .48$, F(1, 38) = 40.54, p < .01, $\eta^2 = .52$ [.28, .66]. There was also a main effect of threat, Wilks' $\lambda = .18$, F(1, 38) = 169.32, p < .01, $\eta^2 = .82$ [.69, .87], that should be interpreted in light of a significant Gender x Threat interaction, Wilks' $\lambda = .90$, F(1, 38) = 4.09, p = .05, $\eta^2 = .10$ [.00, .29]. As shown in Figure 7.5, when viewing low-threat images, men and women reported comparable feelings of pleasantness. When viewing high-threat images, women reported feeling significantly more unpleasant than men. We found no significant main effect for gender, and no other significant interaction, $Fs \le 2.54$, $ps \ge .12$.



Figure 7.5. Differences in the mean (*MM*) pleasantness reports for men and women when viewing low-threat vs. high-threat images. The error bars indicate standard error. The asterisk denotes significant differences (p < .05) between men's and women's scores in that category.

Arousal reports. For participants' arousal reports we found a main effect of threat, Wilks' $\lambda = .25$, F(1, 38) = 113.88, p < .01, $\eta^2 = .75$ [.59, .83], which should be interpreted in light of a significant Threat x Crime interaction, Wilks' $\lambda = .46$, F(1, 38) = 43.84, p < .01, $\eta^2 = .54$ [.30, .67]. We found no significant main effects for gender, or crime, and no other significant interaction effects, $Fs \le 3.66$, $ps \ge .06$. Pairwise comparisons revealed that participants' arousal scores were significantly different for each image category (see Figure 7.6) as denoted by the different subscripts.



Figure 7.6. Differences in the mean arousal reports per CaTIS image category. The error bars indicate 95% confidence intervals. Different superscript letters denote significant differences (p < .01) between categories.

Effects of Gender, Threat, and Crime on Eye Blinks

See Table 7.1 for descriptive statistics of eye blinks (average number of blinks per 6.009 s) for each image category.

Table 7.1

Summary Statistics for Participants' (n = 34) Eye Blinks per CaTIS Image Type

Image category	Min.	Max.	М	SD
Threat-and-crime	0.00	7.10	1.61 ^{<i>a</i>}	1.49
Threat-only	0.10	8.10	2.09^{b}	1.78
Crime-only	0.00	16.40	2.46 ^b	3.19
Neutral	0.10	15.70	2.35 ^b	2.75

Note. Different superscript letters denote significant differences (p < .05).

We conducted a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) three-way ANOVA on participants' eye blinks as they viewed CaTIS images. We found no significant main effects or interaction effects, $Fs \le 4.02$, $ps \ge .05$. To explore group differences that may be concealed by the Threat x Crime interaction effect, we ran a follow-up 2 (Gender: men vs. women) x 4 (Category: threatand-crime vs. threat-only vs. crime-only vs. neutral) two-way ANOVA. We found no significant main effect of gender (as reported in the three-way ANOVA) and no significant interaction effect between Gender x Category, $Fs \le 1.88$, $ps \ge .18$. There was a main effect of category, Wilks' $\lambda = .67$, F(3, 30) = 4.87, p < .01, $\eta^2 = .33$ [.03 .50]. Pairwise comparisons revealed that participants blinked less when viewing threat-andcrime images than for any other category (for which there were no significant differences; see Table 7.1).

Effects of Gender, Threat, and Crime on GSR

See Table 7.2 for descriptive statistics of GSR for each image category.

Table 7.2

Summary Statistics for Participants' (N = 40) Normalised GSR Scores per CaTIS Image Type

Image category	Min.	Max.	М	SD
Threat-and-crime	-0.28	0.28	0.05	0.11
Threat-only	-2.84	4.12	0.08	0.90
Crime-only	-0.25	0.89	0.10	0.19
Neutral	-0.55	0.74	0.09	0.18

Note. Different superscript letters would denote significant differences (p < .05).

We conducted a 2 (Gender: men vs. women) x 2 (Threat: high vs. low) x 2 (Crime: high vs. low) three-way ANOVA on participants' normalised GSR scores. We found no significant main effects or interaction effects, $Fs \le 0.69$, $ps \ge .41$. As for the eye blink data, we ran a follow-up 2 (Gender: men vs. women) x 4 (image category: threat-and-crime vs. threat-only vs. crime-only vs. neutral) two-way ANOVA. We found no significant main effects or interaction effects, $Fs \le 0.87$, $ps \ge .47$.

Correlations between Self-Reported and Physiological Data

To explore how participants' physiological data corresponded with their selfreport data, we calculated Pearson product-moment correlation coefficients between their physiological data (mean eye blinks and normalised GSR score) and self-reported data (pleasantness and arousal) per corresponding image category. We found no statistically significant correlations. We also split the file to explore the gender dynamics (see Table 7.3). For men, none of the correlations were significant. For women, we found no significant correlations across most variables; however, women's self-reports of pleasantness significantly and negatively correlated with their normalised GSR scores for high-crime images (threat-and-crime and crime-only) but not for lowcrime images (threat-only and neutral; see Table 7.3).

Table 7.3

Physiological data	Р	leasantne	ess	Arousal			
category	Overall	Men	Women	Overall	Men	Women	
Eye blinks $(n = 34)$							
Threat-and-crime	.06	03	.23	25	31	25	
Threat-only	07	15	.09	03	04	02	
Crime-only	.15	.00	.33	.17	15	.36	
Neutral	.13	18	.20	.06	.06	.02	
GSR (N = 40)							
Threat-and-crime	07	.22	47*	.05	.17	.05	
Threat-only	.09	.36	32	.12	.13	.18	
Crime-only	06	.28	51*	14	30	02	
Neutral	23	05	36	.12	.05	.20	

Correlations between Participants' Self-Reports and Physiological Data per CaTIS Image Category

Note. Pearson product-moment correlation coefficient *p < .05

Discussion

Self-reports underpin the fear of crime gender paradox where women report more fear of crime than men (Smith and Torstensson 1997). Criminologists have called for the physiological measurement of fear of crime to determine if there is a correspondence between these and self-report measures (Sutton and Farrall 2005; Warr 2000). The recent development of the CaTIS (Noon et al. 2017) provides a validated experimental set of threatening and/or crime related images suitable for use in a physiological fear of crime study. Therefore, our research goal was to examine the drivers of, and correspondence between, men's and women's self-reported and physiological reactions when viewing CaTIS images.

We found some gender differences in self-reports, but no statistically significant gender differences in physiological measures. As hypothesised, women reported more fear of crime on traditional fear of crime measures compared to men (Cops and Pleysier 2011; Jackson 2009; Moore and Shepherd 2007). We had hypothesised that women would self-report feeling less pleasant than men when viewing high-threat or high-crime images; this was supported for high-threat images but not for high-crime images. For self-reports of arousal, we found a significant Threat x Crime interaction where participants self-reported the most arousal when viewing threat-only images, followed by threat-and-crime images, then crime-images, then neutral images. We found no statistically significant differences between men's and women's self-reports of arousal.

We had predicted that participants would exhibit enhanced SNS activation (as shown by increased eye blinks and increased GSR) when viewing high-threat images compared to low-threat images (e.g., Benning et al. 2005; Haaker et al. 2016; Bradley, Codispoti, Cuthbert, et al. 2001). We found limited support for this hypothesis. We found no statistically significant difference in participants' normalised GSR scores in response to threat.

We did, however, find that participants blinked less (rather than more) when they viewed threat-and-crime images compared to the three other image categories. This finding may indicate the activation of an interospective threat response (Pappens et al. 2010). In contrast to the startle reflex activated by the exterospective threat of physical harm and evidenced by more eye blinks, interospective threat responses may be evidenced by fewer blinks (e.g., Ceunen et al. 2013). Eye blinks may slow or stop when people activate their "defence attention" response (Pappens et al. 2010) and pay more attention to their surrounds because they are assessing threat (Deuter et al. 2012). Startle responses may also decrease when cognitive load is high (Pinkney et al. 2014). In combination with our null finding of GSR differences, this may suggest that participants' reactions to threat-and-crime images are being cognitively processed (Gabriel and Greve 2003).

We also explored whether participants' physiological reactions corresponded to their self-reports. When we examined the overall sample data and men's data alone, we found no statistically significant correlations between self-reported and physiological data. Similar to Lang et al. (1993), we did find significant correlations when we analysed women's data. Specifically, women's self-reports of feeling pleasant negatively correlated with their normalised GSR scores when viewing high-crime images (threat-and-crime or crime-only images). This means that women's reports of feeling less pleasant when viewing high-crime images corresponded with an increase in their GSR. There was no such correspondence with self-reports of arousal. As GSR is an indicator of stress or arousal, this is somewhat counter-intuitive. This suggests that self-reports of how pleasant one feels in response to crime might be a good indicator of physiological arousal for women but not for men, and it warrants further investigation. **The Feedback Loop between Physiological Reactions and Emotional Appraisals**

It is important to triangulate participants' physiological and self-report data to see how these experiences are related. In doing so, we gain insights into self-reporting dynamics and how gendered scripts may be informing these reports. Previous research found that men underreport their fear of crime and women overreport their fear of crime, particularly if they are impression managing (Sutton and Farrall 2005; Sutton et al. 2010). In contrast, we did not find significant correlations between desirable responding and traditional fear of crime reports in our sample. Given this, we suggest that men and women are perhaps not purposefully or knowingly being deceptive in their reports but are being influenced by a feedback loop between physiological reactions and emotional appraisals informed by two-trait emotional responses and gendered scripts.

The two-trait theory of emotion. Schachter and Singer's (1962) two-trait theory of emotion is that humans have insight into their bodily arousal but then seek cues from the environment to contextualise the emotion being "felt" and give it cognitive meaning. For example, on a hot day we may experience greater physiological arousal because our body vasodilates to cool us down and keep our organs at a safe temperature (Charkoudian 2010). If someone violates a social norm (e.g., steps in front of us in the line at the grocery store) while we are experiencing this arousal, we may cognitively interpret the arousal as our anger at the offence, and this may inform how we behaviourally respond. Indeed, rates of aggression and assault are higher in the summer months and warmer climates (e.g., Van Lange et al. 2017). Thus, threat reactions may be physiologically experience at an equivalent magnitude by men and women, but the meaning given to this experience may be dependent on context. Although the laboratory presented a controlled environment, we were not able to control for participants' individual interpretations (which may be influenced by gender).

Gendered scripts. Humans receive socialised and gender-driven messages from the community (Holloway and Jefferson 1997) and such messages may grant different permission for how men and women behave and report their feelings (e.g., Ditton et al. 1999). In an example of gender differences in ascribed emotional scripts, Condry and
Condry (1974) asked participants to describe a video of a toddler exhibiting a startle response. Generally, participants who were told the toddler was a boy described him as angry, and participants who were told the toddler was a girl described her as scared. Dutton and Aron (1989) also found this dynamic when they asked men and women to watch videos of the Milgrim experiment, self-report their arousal, and provide an explanation for this arousal. Men reported more anger as an explanation of their arousal, and women reported more anxiety. These findings have been replicated (e.g., Hess et al. 2009) and may partially explain why men and women self-report such different emotions. Gendered scripts derived from gender socialisation may provide a framework by which to give meaning to physiological arousal.

Gender differences in threat detection. Men and women may also have different drivers and motivators for detecting threat. Pennebaker and Roberts (1992) established that men may use internal cues to reference their feelings, whereas women may use external cues. They hypothesised that this is due to social stratification where women are generally lower status than men and are, therefore, more motivated to read and detect external threats. In addition, when participants are asked to explain men's and women's emotion, men are granted emotional states (anger due to a "bad day") whereas women are assigned emotional traits (anger because she is an "angry person;" Barrett and Bliss-Moreau 2009). Taken together, this might explain why women attend to threatening objects more than men (Mesch 2000; Schmitz and Grillon 2012; Warr 2000). These threats may *feel* more real and may *be* more real because of status disadvantage (Assari 2017) but are also reaffirmed by women needing to justify and legitimise their emotions. This could explain why we found correspondence between women's (but not men's) self-reports and physiological activations.

Limitations and Future Research

We issue a note of caution in interpreting our results. It would be tempting to view self-reports as "socialised" and physiological data as hard-wired "biology" (Bradley, Codispoti, Sabatinelli, et al. 2001). It may be harder for participants to control physiological reactions, but participants can minimise these reactions (e.g., Diekhof et al. 2011; Gross and Levenson 1993) and regulate their emotions (Thompson 1994). Therefore, a limitation is that we did not control for emotional regulation effects.

So, if not biology, what is the difference between self-report and physiological measures at a construct level? And, why is it important to measure these reactions? We

might assume that participants are more able to regulate and impression manage selfreports; however, we found that self-reports of arousal (in theory, as easy to impression manage as pleasantness reports) were not significantly different between men and women. We could speculate that pleasantness and arousal self-reports may require different degrees of cognitive appraisal, and self-reports of pleasantness may undergo more cognitive appraisal than self-reports of arousal. This cognitive appraisal may create room for the activation of gendered scripts. For example, it may be that everyone is given social permission to feel arousal when threatened, but that women are expected to evaluate that threat as unpleasant (or frightening, disgusting, gruesome, etc.), whereas men are expected to be nonchalant. Further research is necessary to better understand these dynamics.

Another limitation of this research was that we asked participants to complete the Affect Grid as a measure of their emotion response rather than rate their fear specifically (as in Noon et al. 2017). We made this decision because: a) we did not wish to prime a fear response; b) pleasantness and arousal are considered key dimensions of emotion (Barrett 1998; Kensinger and Corkin 2004); c) the Affect Grid is a well validated measure of emotion, and is easy and quick for participants to rate on multiple occasions (Russell et al. 1989); and d) the term fear of crime may be popularised, but the evidence that people are actually having a fear reaction to crime is lacking (Gabriel and Greve 2003; Noon et al. under review; Warr 2000). Future research could replicate this study with a fear measure.

To expand our understanding of fear of crime, we recommend further research using the CaTIS and other physiological measures such as heart rate (with a design where CaTIS images are shown in blocks by category rather than randomly, as such short time frames in the current study precluded the effective use of this measure), facial responses (Chaplin and Aldao 2013; Fischer and LaFrance 2015; Kring and Gordon 1998), hormone responses (Ashare et al. 2013), or brain studies with functional Magnetic Resonance Imaging (fMRI; McRae et al. 2008). Using other experimental techniques such as the bogus pipeline or "fake polygraph" (where participants are told their self-reports can be verified; Roese and Jamieson 1993) may be informative in understanding reporting biases (Jones and Sigall 1971; Strang and Peterson 2016), particularly when physiological measures are not readily available to researchers. This triangulation may assist in better understanding the complex underpinnings of fear of crime, and whether these are emotional, cognitive, behavioural, or physical activations (Caicedo and Van Beuzekom 2006; McLeod et al. 1986).

Despite demonstrating the fear of crime gender paradox where women self-report significantly more fear of crime than men, we did not find the same gender differences when we examined physiological data. We also found limited correspondence between self-reported and physiological reactions for men but not women. This study paves the way for further physiological research into the fear of crime using experimental methods.

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Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime

Technical Appendix

Other Measures

As reported in the main text, we included other self-report and physiological measures to ascertain whether "noise" variables influenced or explained our results. We detail these measures in our Procedure but do not report on them further because they were not central to our research question. More information on each measure and the associated results can be requested from the first author.

Self-report measures. These included the 5-item Perceived Threat and Safety Measure (Carlton-Ford et al. 2008) to measure sense of safety in different locations, such as at home or in the local neighbourhood; the 10-item Severity Measure for Generalised Anxiety Disorder (GAD) – Adult (American Psychiatric Association 2013) to measure anxiety; the Sex Role Identity Scale (Storms 1979) to measure participants' perceptions of their masculinity and femininity; the Personal Attributes Questionnaire (Spence et al. 1975) to measure the gendered components of expressivity (feminine) and instrumentality (masculine); a measure of Policing Satisfaction (ABS 2014a); and a measure of Stranger Victimisation (Noon et al. 2017).

Physiological. In addition to GSR and eye blinks, we measured heart and respiratory data. Because participants viewed the images in a randomised order (one block of 40 images), rather than viewing images in separate category blocks (four blocks of 10 images), we could not ascertain reliable heart or respiratory data (thus we excluded these data from our results). It is, however, an appropriate time period for measuring more immediate startle responses (Bianchin and Angrilli 2012; Lang et al. 1993). More information on these measures can requested from the first author.

Heart rate and heart rate variability. We obtained heart rate by recording the ECG and calculating cycle length (in seconds) and bpm. There is a plethora of research regarding heart rate and how it is influenced by emotional arousal (e.g., Asendorpf and Scherer 1983; Garfinkel et al. 2014), including in fear of crime scholarship (Castro-Toledo et al. 2017; Kim and Kang 2018). Heart rate measures appear to be effective when participants are exposed to stressful stimuli for an extended period; however, our design excluded its use here. Specifically, heart rate cannot be effectively measured in

multiple and sequential six second intervals. The purpose of including this measure was to confirm that heart rate issues where not influencing our other variables for the duration of the physiological component of the study.

Respiratory rate. We also measured respiratory rate including inhalation and expiration (Stern et al. 2001). We used this as a check to see if respiration might be influencing other physiological measures.

Chapter 8: Conclusion

Women consistently report higher fear of crime than men (Cops & Pleysier, 2011; Jackson, 2009; Moore & Shepard, 2007) despite women's lower risk of stranger victimisation compared to men's (Heimer & Lauritsen, 2008). Explanations for this are wide-ranging but have not been experimentally tested until now. The overall goal for the research reported in this thesis was to test core assumptions and drivers of the fear of crime gender paradox using quasi-experimental methods. In this chapter I provide a summary of findings, outline limitations of the research, and discuss broader implications and applications for the outcomes of this quasi-experimental exploration of the fear of crime gender paradox.

Overview of Findings

In this thesis I have explored the fear of crime gender paradox across three quasi-experimental studies and four papers. We created, evaluated, and validated an image set (the Crime and Threat Image Set, or CaTIS) and examined participants' patterns of fear ratings (*Paper 1*), before conducting a gender analysis of these fear ratings (*Paper 2*). Next, we examined participants' self-reports of their emotional state and written reactions (*Paper 3*) before examining both self-reported and psychophysiological data (*Paper 4*). More information on each paper and a summary of its findings is outlined.

Paper 1. *Paper 1* had two research aims. The first aim was to create, evaluate, and validate a set of images that varied across the dimensions of threat (high vs. low) and crime (high vs. low) for use in further research. In the two evaluation studies (N = 24 and 29) 80 images were deemed suitable for validation. In the third study (N = 176) 78 of these 80 images were retained, and this became the CaTIS (with four image categories: threat-and-crime which were high-threat and high-crime images and included 20 images; threat-only which were low-threat and low-crime images and included 20 images; and neutral which were low-threat and low-crime images and included 18 images; and neutral which were low-threat and low-crime images and included 20 images). By creating this image set we were able to test the influence of threat and crime as separate independent variables, and to replicate the methodologies typically implemented in the study of threat (e.g., Bianchin & Angrilli, 2012; Bradley, Codispoti, Sabatinelli, & Lang, 2001). The CaTIS is now freely available to other researchers.

The second aim was to determine whether fear reports were being influenced by threat and/or crime, and whether fear of crime developed as a projection of broader threats onto crime (the broad pathway) or as a response to crime specifically (the narrow pathway; Hirtenleher & Farrall, 2013). We found a significant Threat x Crime interaction on participants' fear ratings: participants gave significantly higher fear ratings towards the threat-and-crime and threat-only images than the crime-only images, which had significantly higher fear ratings than the neutral images. We also found that participants' own ratings of threat—but not crime—had a strong relationship with their fear ratings.

Although this paper did not examine gender dynamics, it did explore the effect of clinical anxiety on fear of crime. Participants' anxiety scores correlated positively with their fear ratings across all image categories except threat-only. Anxiety scores also correlated positively with traditional fear of crime measures. When we split the groups' data into those who were clinically-anxious and those who were not, we found three significant differences in fear reports: the clinically-anxious group rated neutral images as more fear-provoking, reported greater crime worry, and reported lower perceptions of safety than the non-clinical group.

Our findings provide evidence for the broad—rather than the narrow—pathway to fear of crime (Ferraro 1995; Hirtenlehner & Farrall 2013). Crime may represent a subset of generalised fears, paralleling other types of specific fears. Traditional fear of crime measures may measure general fear and anxiety rather than fear of crime specifically.

Paper 2. Given that we did not explore the fear of crime gender paradox in *Paper 1*, the aim of *Paper 2* was to tease apart the influences of threat and crime on men's and women's fear ratings using an online quasi-experimental mixed-factorial design with *Paper 1* data (third study only, N = 176, with 81 men and 95 women). In line with the fear of crime gender paradox, women reported higher fear of crime and lower perceptions of safety on traditional measures than men. Although women did report greater fear when viewing CaTIS images than men, this was influenced by how threatening images were, and not how crime-related they were. This overall pattern of results did not change when social desirability bias and anxiety were included as covariates.

Taken together, this suggests that the fear of crime gender paradox may not narrowly and exclusively relate to crime, but instead may reflect a broader *fear of threat* (rather than fear of crime) gender paradox (Bradley, Codispoti, Sabatinelli, et al. 2001; Gustafsod, 1998; Hirtenlehner & Farrall, 2013). As women report more general fear than men (e.g., Eaton et al., 2012; Gustafsod, 1998; Schmitz & Grillon, 2012) traditional fear of crime measures may measure general fear and anxiety rather than fear of crime specifically. This reaffirms our findings from *Paper 1*.

Paper 3. Researchers have previously found that reconceptualising fear of crime to include anger about crime resulted in men's and women's reporting rates being similar (Ditton, Bannister, Gilchrist, & Farrall, 1999). For Paper 3 we wanted to investigate how CaTIS images influenced men's and women's reported emotional states using advanced psychometrically validated tools. This directly addressed a limitation of Paper 2 as we had only analysed fear ratings. This study had a between-subjects quasiexperimental design (N = 427, with 195 men and 232 women) which was distinct from the within-subject design implemented in *Papers 1 & 2*. We found that women wrote more fear words than men, but this was not influenced by the images they viewed. Women's emotions also changed when they viewed high-threat images: they reported increased anger and fear and reduced positive affect and satisfaction when compared to women who viewed low-threat images and men. Participants, regardless of gender, who viewed high-crime images reported increased sadness and anger (and reduced satisfaction and sense of safety) compared to those who viewed low-crime images. This suggests that people's responses are more diverse than just fear, and gender differences are a response to threat, not crime, potentially making this an *emotional response to* threat (rather than fear of crime) gender paradox.

Paper 4. Warr (2000) and Sutton and Farrall (2005) have called for fear of crime researchers to use psychophysiological measures. For this reason (and as using only self-report measures was a major limitation of *Paper 1, 2,* and *3*), in *Paper 4* we wanted to explore the extent to which men's and women's self-reported and physiological data corresponded as they viewed the CaTIS images. We used a laboratory quasi-experimental mixed-factorial design (N = 40, with 20 men and 20 women).

Consistent with the literature and *Paper 1, 2,* and *3,* women reported higher fear of crime and lower perceptions of safety using traditional measures than men. Both men

and women reported feeling unpleasant when viewing high-crime compared to lowcrime images, but women reported feeling more unpleasant when viewing high-threat images than did men. Participants, regardless of gender, self-reported the most arousal when viewing threat-only images, followed by threat-and-crime images, then crimeimages, then neutral images. Participants, regardless of gender, blinked significantly less when viewing threat-and-crime images than the other images. This may have indicated an interospective threat response (rather than extereospective threat responses) towards threat-and-crime images. Interospective threat can activate "defence attention" (Pappens et al., 2010) required to assess threat (Deuter et al., 2012). Participants' gender did not influence their Galvanic Skin Response (GSR) recordings, nor did the images they viewed. In combination, this may suggest that participants' reactions to threat-andcrime images are being cognitively processed (Gabriel & Greve, 2003). There were significant negative correlations between women's ratings of pleasantness and GSR; however, the same pattern of results was not observed for men.

This research reaffirmed traditional self-report findings (as found in *Papers 2, 3,* and the broader literature), and some differences in self-reports of emotion; however, in analysing physiological data we found no statistically significant differences in men's and women's responses. We did find a correspondence between women's self-reports of (un)pleasantness and increased GSR. This suggests that well established gender differences may result from self-reporting dynamics rather than physiological activations for men, but not women. As we found that the self-report gender dynamic was not reflected in physiological data, the fear of crime gender paradox may be a *self-reported emotional response to threat* (rather than fear of crime) gender paradox. The drivers to this could include deliberate impression management, but we alternatively proposed that men and women may both experience Sympathetic Nervous System (SNS) activation when faced with threat and crime, but women may more readily interpret this activation as fear due to socialised gender scripts.

Other findings. Across the four papers we found some evidence that anxiety may influence women's heightened fear reports (Eaton et al., 2012) and that social desirability may frame men's lowered fear reports (Sutton & Farrall, 2005), but the findings were not overly compelling or consistent.

Synthesis of findings. In this research we explored three key research questions:

1. Whether we could find evidence for the fear of crime gender paradox using innovative experimental methods. If so, were these gender differences a response to crime (as per the fear of crime literature) or to threat (as per the psychological literature). In response to this question, we were able to easily and consistently establish the fear of crime gender paradox using traditional fear of crime measures; however, we could not establish a fear of crime gender paradox using quasi-experimental methods. Instead, we found a fear of threat gender paradox. This was consistent with the psychological literature but had not been experimentally tested in the fear of crime literature. This may mean that gender differences in threat responses are projected onto crime.

2. Whether the fear of crime gender paradox was a (psychologically defined) fear response or another emotion. In response to this research question, we found limited evidence that this was a fear response because both men and women selfreported heightened sadness and anger, as well as reduced satisfaction and sense of safety, in response to crime. We did find some evidence of physiological interospective threat responses rather than an exterospective threat responses towards threat-and-crime, but with no difference between men and women.

3. Whether there was a correspondence between self-reported and physiological measurements of fear of crime and what correspondence (and divergence) might tell us. In response to this question, we found there was little correspondence between men's self-reports and physiological responses, but some correspondence between women's self-reports of pleasantness and their GSR. This may tell us that men and women are cognitively processing their physiological activation differently. We found limited evidence that anxiety and social desirability informed the fear of crime gender paradox; however, more research is needed.

The overall goal for the research was to test core assumptions and drivers of the fear of crime gender paradox. We found that the fear of crime gender paradox is not about fear and is not about crime. These findings should guide further research in devising interventions and public policy to support greater congruence between people's perceptions of their safety and their actual risk of victimisation, thereby enhancing their wellbeing and maximising their safety. Please note that, for readability,

the remaining discussion does still refer to the term fear of crime despite the presented evidence regarding the construct's complexity.

Research Limitations

For this research we relied on quasi-experimental methods to investigate the effects of specific variables. This method deviates significantly from other fear of crime research and so reveals different information. Future experimental research may allow us to measure fear and other emotions in different ways, but quasi-experimental methods (and these papers in particular) are not without limitations.

CaTIS limitations. The threat-only image category included only animal threats, which is not representative of broader non-crime related threats. Despite efforts to include more threats (such as dentists, clowns, needles, and public speaking) participants only rated animal images as consistently threatening, so those were the only images that met the validation criteria.

Representativeness of the sample. The representativeness of our samples is a limitation, as it was mainly students who participated in the studies. Students may respond in a manner that can vary in scale, direction (Peterson 2001), or pro-sociability (Falk Meier & Zehnder 2013) when compared to community samples. This may limit the generalisability of the results despite how common this practice is in experimental design (Henrich, Heine, & Norenzayan, 2010).

Our Australian sample may also limit the generalisability of our findings due to cultural differences. We are mindful that deadly creatures perhaps form an important part of the Australian culture, as evidenced by primary school education regarding deadly snakes that commenced in the 1870s (Hobbins, 2013). There is limited evidence of whether such exposure enhances or minimises Australian anxieties about such creatures, but it does appear that fear of snakes and spiders is instinctual and common across not only our species, but mammals more broadly (DeLoache & LoBue, 2008; Öhman & Mineka, 2003). We assert that Australians are not likely to respond uniquely to these images, but this does require testing. The CaTIS could be used in other countries to test this.

That said, our results indicate that these Australian university samples of men and women responded to traditional fear of crime measures in a similar fashion to men and women in various community samples (e.g., Smith & Torstensson, 1997). **Influence of community events.** There are community wide dynamics that may inform fear of crime reports (Chadee & Ditton, 2005). We potentially balanced for this by collecting data across many months per study and from participants in multiple locations.

Influence of gender priming. In this research we found consistent gender differences; however, a gender stereotype threat (where women are emotional and men are rational; Fischer, 1993) may have been activated by the study design. When participants were recruited they signed up for the study based on their gender identity (we did this to recruit similar numbers of men and women). As is common practice, participants also completed a demographic question about their gender when they first started the survey; and for Paper 3 and 4 they also completed gender identity scales (Storms, 1979; Spence, Helmreich & Strapp, 1975). There is some evidence that asking participants to list their gender or race will activate a stereotype threat that will inform their responses. For example, Shih, Pittinsky, & Ambady (1999) found that Asian women primed for their female status performed poorly on mathematical tasks compared to un-primed participants. When primed for their Asian status these participants performed well compared to un-primed participants. Those under stereotype threat might physiologically displayed heightened anxiety compared to times when they are not under threat or compared to others not under threat (Vick, Seery, Blascovich, & Weisbuch, 2008). That said, stereotype threat research has focused on performance rather than emotional reactions (Schmader, Johns, & Forbes, 2008). Poorer performance is theoretically because participants are occupied with emotionally managing the stress of reinforcing negative stereotypes about one's own in-group (Steele, 1997) and this momentarily decreases the participant's cognitive abilities (Johns, Inzlicht, & Schmader, 2008). This may not have happened with emotional responding, as participants may not perceive gender stereotypes about emotional expression as negative or offensive, or may view these as biologically determined (Parker, Horowitz, & Rohal, 2017). Either way, if priming did occur then gender dynamics may have been amplified.

Summary of limitations. Using experimental approaches to study the fear of crime has its limitations. Critiques of this research could describe examining fear in the moment and in response to an image as reductive. Perhaps yearly interviews regarding the threat of stranger violence would better capture "something" of policy interest that

asking participants to rate images. Despite the limitations, we have much to gain from using experimental methods to examine the fear of crime construct, particularly if these methods reveal that traditional fear of crime measures are not assessing fear reactions to crime responses. Jackson (2006) has said that the tools used in the past have not been exacting enough, and that "we lack any empirical assessment of a psychological account [of fear of crime]" (p. 3). This research may partially address this gap.

Future Research

This innovative research represents the first experimental examination of the fear of crime gender paradox. This is a significant contribution to the field which may encourage others to investigate the phenomenon using experiments. Fear of crime scholars and students can now access the CaTIS for their own studies to explore other variables. Future directions may include introducing new status and dependent variables specifically. More experimental work on distinguishing the emotional and cognitive components (Stoyanova & Hope, 2012) underpinning the fear of crime construct is another logical next step (Gabriel & Greve, 2003).

Other status variables. This research has focused on gender because it is a pervasive theme in the literature (Cops & Pleysier, 2011; Henson & Reyns, 2015; Lane & Fisher, 2009). The focus of future work could include a range of status variables because gender is only one component of complex and intersectional human identity (Brody & Hall, 2010), and/or highly correlated with latent variables.

Vulnerability. Given that those who are more vulnerable have also been found to report more fear of crime (Alvi, Schwartz, DeKeseredy, & Maume, 2001; Killias & Clerici, 2000) future research could examine how vulnerability and gender coincide. This is a variable our research did not explore. There is no nation where women's status is equal to men's (Inglehart & Norris, 2003; United Nations Development Program, 2016) and this status may inform feelings of vulnerability and activate heightened threat responses (Pennebaker & Roberts, 1992).

Cultural identity. Researchers have made efforts to investigate fear of crime across cultures (Chadee & Ditton, 2005; Liska & Baccaglini, 1990; Özaşçılar & Ziyalar, 2015), but this research often relies on assumptions about the national drivers of fear of crime. Using the CaTIS with cross-national samples could provide a clear comparison point. In addition, collecting information regarding racial identity may illuminate the influence of intersectional influences on fear of crime.

Previous experiences of non-stranger victimisation. Given the gendered dynamics of violence, assessing previous histories of intimate partner violence, sexual harassment, and sexual assault may help us interpret experimental results and reactions to the CaTIS.

Anxiety. There is a research gap in understanding the causal relationship between fear of crime and anxiety, as this is currently unclear despite assertions that fear of crime leads to poor mental health (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford et al., 2007). In longer survey formats participants can provide more adequate clinical information to determine their anxiety levels. We did—in part attempt this, but given our finding that the broad pathway to fear of crime may drive fear of crime reports, more research is recommended. This may also include recruiting clinical populations specifically.

Examining other dependent variables. By using images and advanced psychometrically validated measures we can ascertain participants' momentary reflections in subtle ways (e.g., by assessing mood change as per *Paper 3*). That said, we may attempt to promote threat responses with imagery, but the human brain can determine the difference between threat in real life and threat on a screen. This limits the ecological validity of these kinds of studies. Therefore, when people report their emotional reaction this may undergo cognitive processing. Given this, the underlying emotional and cognitive processes underpinning these reports remain unclear and are an avenue of further enquiry.

Measuring a wider range of dependent variables might help us examine the gender paradox and its potential effects on emotions and/or cognitions. These new measures could include physiological reactions such as heart rate (Castro-Toledo et al., 201), facial reactions (Chaplin & Aldao, 2013; Fischer & LaFrance, 2015; Kring & Gordon, 1998), or cortisol levels (Kirschbaum, Wüst, & Hellhammer, 1992). To better understand the distinction between emotional reactions and cognitive appraisals, we could discern amygdala (activated in the threat response) and cortical (activated in cognitive appraisals) activation using functional Magnetic Resonance Imaging (fMRI; e.g., McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008). Researchers examining serotonin receptor responses through genotyping studies have also found gender differences as men and women view anti-tobacco advertising (Ashare et al., 2013). We could implement similar procedures using the CaTIS.

We could also use innovative measures to assess underlying psychological constructs without requiring elaborate or expensive equipment. For example, participants could view the CaTIS and we could test their memory for the images (e.g., Burton et al., 2004; Bywaters, Andrade, & Turpin, 2004; Cahill, Gorski, & Le, 2003) as people generally have better memory for emotionally arousing images (Laney, Campbell, Heuer, & Reisberg, 2004). This could be informative because memory plays a part in constructing gender identities (Barrett, Robin, Pietromonaco, & Eyssell, 1998), and gender may inform what memories are stored (Grabe & Kamhawi, 2006). We could also look to how exposure to the CaTIS (and, therefore, threat and/or crime) might influence attitudes and behaviours associated with the fear of crime construct. This could include aggressive behaviours (Reith, 1999), voting behaviours (Brader, 2005), avoidant and defensive behaviours (May, Rader, & Goodrum, 2009), or punitive attitudes (Dowler, 2003).

Clinical Implications and Applications

This research has examined the fear of crime gender paradox (a concept often discussed in the criminological literature) and used experimental methods (derived from the social psychology scholarship) to uncover outcomes and ideas with clinical application. Crimes against people (as opposed to crimes against property) can result in physical injury and loss of life, but victimisation may also induce distressing feelings of shame and anger towards self and others (Andrews, Brewin, Rose, & Kirk, 2000), negative responses from others (especially for women; Andrew, Brewin, & Rose, 2003), as well as post-traumatic stress disorder or its symptoms (APA, 2013; Elklit, 2003; Orth, Montada, & Maercker, 2006). This means that interpersonal victimisation threat may create concerns about injury *and* insult. From an evolutionary perspective, violent victimisation may threaten the victim's social status and belonging to their in-group, which is risky given that human survival may partially rely on social dependence (Baumeister & Leary, 1995). This may mean that our responses to the threat of criminal victimisation sit within a psychosocial context.

We consistently found that the fear of crime phenomenon is not a fear response, is not a reaction to crime, and that gender differences may indicate differences in threat reactions that are (potentially) an outcome of gender socialisation. These findings should guide the design of interventions that support greater congruence between people's perceptions of their safety and their actual risk of victimisation, thereby enhancing their wellbeing and maximising their safety. These interventions may operationalise at two different levels. First, for individuals who may experience distress due to their concern of criminal victimisation. Second, public health interventions that are implemented community-wide. Because our findings counter commonly held beliefs about fear of crime, this sheds light on the interventions that have been previously proposed and allows us to reorient our efforts. Fear of crime measures have been used as a "best value performance indicator" (Farrall, 2004, p.158) of government services (Productivity Commission, 2014) but might really indicate the success or failure of clinical and public health interventions.

Individual-level interventions. If the goal is to support greater congruence between people's perceptions of their safety and their actual risk of victimisation, then individual-level interventions that promote women's fear (e.g., self-defence classes) are not likely to be effective. Such interventions may limit a women's community participation and drive her to seek protective and potentially aggressive intimate partners (Morgan, 2001; Ryder, Maltby, Rai, Jones, & Flowe, 2016; Snyder et al., 2011). Both outcomes may negatively influence her long-term wellbeing (VicHealth, 2007; Zubrick et al., 2010). Strategies that do not address men's stranger victimisation rates may also ignore their heightened risk and/or promote expectations that they can handle situations that are life-threatening (Gilchrist, Bannister, Ditton, & Farrall, 1998).

Even though we found limited evidence for fear of crime being a psychologically-defined fear response to crime, if individuals were specifically fearful of crime we should consider if this phenomenon is better conceptualised as a specific phobia (or *scelerophobia*, from the Latin for fear of crime) than a community-level issue. Clark (2003) did map fear of crime against the Diagnostic Statistical Manual (DSM) IV (American Psychiatric Association [APA], 1994) general criteria for phobias and noted that a client should present with apprehension, physiological arousal, and an associated change of behaviours. Clark's (2003) asserted fear of crime caused apprehension and changed behaviours, but that there was not enough evidence of the necessary physiological activations. We were able to find some evidence of physiological arousal towards threat and crime in combination, but more research is needed to confirm this criterion has been met. Clark was also writing before the new DSM-V by was released by the APA in 2013, so I conducted a similar mapping of the fear of crime phenomena against new DSM-V criteria (see Appendix Eleven). It has been long assumed that fear of crime leads to poor mental health outcomes (Jackson & Stafford, 2009; Klama & Egan, 2011; Stafford et al., 2007) and the associated quality of life losses are calculated in fear of crime cost estimates (Dolan & Peasgood, 2007). We found evidence that would support (or at least support us investigating further) the broad pathway to fear of crime, whereby participants appear anxious about the world, and then project this onto crime as a modern-day threat (Hirtenlehner & Farrall, 2013). If this is the case, we would still find a positive correlation between anxiety and fear of crime, but the direction of this relationship may be that anxiety leads to fear of crime, and not that fear of crime leads to anxiety. If anxiety leads to fear of crime, then individual therapies that minimise anxiety could be effective (e.g., Cognitive Behavioural Therapy [CBT]; Butler, Chapman, Forman, & Beck, 2006). More research is warranted.

Public health initiatives. Fear of crime researchers have suggested two possible community-level interventions: addressing sensationalist media reporting and reducing signs of community disorganisation. Here I discuss our research and how it might inform this conversation.

Previous researchers have asserted that sensationalistic media reporting is one of the key drivers and predictors of fear of crime (e.g., Doob & MacDonald, 1979; Heath & Gilbert, 1996; Ziegler & Mitchell, 2003). Given this, Warr (2000) proposed piloting media interventions where statements about how much crime occurs would be provided next to media coverage of crime (to counterbalance sensationalistic reporting that may insinuate high rates of stranger victimisation risk). The research presented in this thesis may provide some insight into whether sensationalistic media reporting drives fear of crime, as we showed participants different image categories as part of the betweensubject design (in Paper 3) and measured their reactions. We exposed some participants to images that sensationalist media may include (threat-and-crime images) and compared this group to other participants viewing non-sensationalist images (the other three image categories). We found no difference between the different groups' traditional fear of crime reports (which they provided after viewing the images). This may indicate that images alone do not drive fear of crime reports as gauged by traditional measures, but also implies a limited relationship between such media coverage and enhanced fear of crime. It may be that fear of crime as reported using traditional methods is not particularly easy to shift (as evidenced by women's higher

reports of fear of crime than men across all studies), or that these reports are so closely wedded to social expectations that their rates are predetermined by gender. That said, we did find that participants reported feeling less pleasant when viewing high-crime images (compared to low-crime images) and blinked less when viewing threat-and-crime images compared to the other three image categories (*Paper 4*). We recommend further research into media interventions as these results are interesting but inconclusive.

Interventions that address community disorganisation and fix "broken windows" have also been proposed by fear of crime researchers (Hinkle & Weisburd, 2008; Lorenc et al., 2013). As we found that fear of crime may be a response to threat, not crime, these interventions to improve neighbour environments may be ineffective. If fear of crime is not about crime, then the most effective interventions could aim to minimise broader fear and anticipate a consequent reduction in fear of crime. For this reason, the best interventions may be those that lower generalised anxiety (whether individual therapies or public health initiatives).

We found that the fear of crime gender paradox may result from the gender socialisation of threat responses. If the fear of crime gender paradox is informed by gendered scripts where women are fearful and incompetent to protect themselves, and men are brave and autonomous (Brody & Hall, 2010; Goodey, 1997) then disrupting these scripts is critical. This may include supporting men to be emotionally connected and express their fear and supporting women's community participation and bravery. Primary prevention interventions that enhance gender literacy, promote gender equality, and require communities to question rigid gender roles has been a focus of public policy in Australia for the last decade (Council of Australian Governments, 2016; VicHealth, 2007). It is too soon to say that these same initiatives may reduce fear of crime, improve wellbeing, enhance community safety, limit men's victimisation perpetrated by strangers, and decrease excessive costs. More research is necessary to explore the links and target interventions.

Fear of crime is a costly phenomenon (Dolan & Peasgood, 2007) with counterintuitive relationships to the crime rate or rational assessments of risk (Ferraro, 1995; Warr, 2000). Community interventions to reduce this fear can be expensive, and there is little evidence regarding their effectiveness (Grabosky, 1995; Lorenc et al., 2013). In the future, experimental methods may allow us to trial interventions that may decrease irrational and unproductive levels of fear for individuals and in the community. This could support the development of worthy and low-cost options that enhance perceptions of safety and increased community participation (Zubrick et al., 2010).

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VOLUME II

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Appendix One: Ethics Declaration

All conditions pertaining to the clearances (attached) were properly met. Annual progress reports and final reports have been submitted to the Swinburne Human Research Ethics Committee (SUHREC).

Signature:_____

Michelle S. Noon

11th February 2018

Appendix Two: Ethics Approval Statements

Papers 1 & 2 Human Research Ethics Approval

From: Kaye Goldenberg Sent: Friday, December 19, 2014 4:37 PM To: Ann Knowles; Michelle Noon Subject: SHR Project 2014/317 Ethics Clearance

To: Assoc Prof Ann Knowles, FHAD/Ms Michelle Noon

Dear Prof Knowles,

SHR Project 2014/317 Exploring the fear of crime gender paradox: How do men and women affectively respond to the threat of crime? Study 1 of 3 Assoc Prof Ann Knowles, FHAD/Ms Michelle Noon Approved Duration: 19/12/2014 to 19/02/2018 [Adjusted]

I refer to the ethical review of the above project protocol by a Subcommittee (SHESC1) of Swinburne's Human Research Ethics Committee (SUHREC) at a meeting held 9 December 2014.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current *National Statement on Ethical Conduct in Human Research* and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. Information on project monitoring, self-audits and progress reports can be found at:<u>http://www.research.swinburne.edu.au/ethics/human/monitoringReportingChanges/</u>
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance. The SHR project number should be quoted in communication. Researchers should retain a copy of this email as part of project recordkeeping.

Best wishes for the project.

Yours sincerely,

Kaye Goldenberg Acting Secretary, SHESC1

Kaye Goldenberg **Research Ethics Executive Officer (Acting)** Swinburne Research (H68) Swinburne University of Technology Level 1, SPS, 24 Wakefield Street Hawthorn, VIC 3122 Tel: +61 3 9214 5218 Fax: +61 3 9214 5267 Email: kgoldenberg@swin.edu.au From: Astrid Nordmann
Sent: Thursday, July 30, 2015 2:09 PM
To: Ann Knowles
Cc: RES Ethics; Jennifer Beaudry; Michelle Noon
Subject: SHR Project 2015/174 - Ethics clearance

To: A/Prof. Ann Knowles, FHAD

Dear Ann,

SHR Project 2015/174 – Exploring the fear of crime gender paradox: How do men and women affectively respond to the threat of crime? Study 2 of 3. A/Prof. Ann Knowles, Ms Michelle Noon (Student), Dr Jennifer Beaudry - FHAD Approved duration: 30-07-2015 to 05-03-2018 [adjusted]

I refer to the ethical review of the above project protocol by a Subcommittee (SHESC1) of Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the review, as per the email sent on 15 July 2015, were put to the Subcommittee delegate for consideration.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current *National Statement on Ethical Conduct in Human Research* and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. Information on project monitoring, self-audits and progress reports can be found at:<u>http://www.research.swinburne.edu.au/ethics/human/monitoringReportingChanges/</u>
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance. The SHR project number should be quoted in communication. Researchers should retain a copy of this email as part of project recordkeeping.

Best wishes for the project.

Yours sincerely, Astrid Nordmann SHESC1 Secretary

Dr Astrid Nordmann **Research Ethics Officer** Swinburne Research (H68) Swinburne University of Technology PO Box 218, Hawthorn, VIC 3122 Tel: +613 9214 3845 Fax: +613 9214 5267 Email: <u>anordmann@swin.edu.au</u>

From: Sally Fried on behalf of RES Ethics
Sent: Wednesday, March 23, 2016 8:52 AM
To: Ann Knowles
Cc: Jennifer Beaudry; Michelle Noon; RES Ethics
Subject: SHR Project 2016/034 - Ethics Clearance

To: A/Prof Ann Knowles, FHAD

Dear Ann,

SHR Project 2016/034 – Exploring the fear of crime gender paradox: How do men and women affectively respond to the threat of crime? Study 3 of 4. A/Prof Ann Knowles, Dr Jennifer Beaudry, Ms Michelle Noon (student) - FHAD Approved duration: 23-03-2016 to 28-02-2018 [Adjusted]

I refer to the ethical review of the above project by a Subcommittee (SHESC1) of Swinburne's Human Research Ethics Committee (SUHREC). Your response to the review as emailed on 19 March 2016 were put to the Subcommittee delegate for consideration.

I am pleased to advise that, as submitted to date, ethics clearance has been given for the above project to proceed in line with standard on-going ethics clearance conditions outlined below.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the *National Statement on Ethical Conduct in Human Research* and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. <u>Information</u> on project monitoring and variations/additions, self-audits and progress reports can be found on the Research Intranet pages.
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the Swinburne project number. A copy of this email should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely,

Sally Fried

Secretary, SHESC1

Appendix Three: Journal Information

Journal of Experimental Criminology (JOEX; Published Paper 1, reviewing Paper 4)



Journal of Experimental Criminology Editor-in-Chief: L Mazerolle

Editor, Systematic Reviews: D.B. Wilson

- Offers experimental and quasi-experimental research in the development of evidence based crime and justice policy
- Spans an array of scientific disciplines concerned with crime and justice
- Promotes advancement of the science of systematic reviews and experimental methods in criminology and criminal justice

The Journal of Experimental Criminology focuses on high quality experimental and quasiexperimental research in the development of evidence based crime and justice policy. The journal is committed to the advancement of the science of systematic reviews and experimental methods in criminology and criminal justice. The journal publishes empirical papers, reviews of substantive criminal justice problems, and methodological papers on experimentation and systematic review. Coverage ranges across the broad array of scientific disciplines that are concerned with crime and justice problems.

Sex Roles: A Journal of Research (Reviewing Paper 3)



Aims and Scope

Sex Roles: A Journal of Research is a global, multidisciplinary, scholarly, social and behavioral science journal with a feminist perspective. It publishes original research reports as well as original theoretical papers and conceptual review articles that explore how gender organizes people's lives and their surrounding worlds, including gender identities, belief systems, representations, interactions, relations, organizations, institutions, and statuses. The range of topics covered is broad and dynamic, including but not limited to the study of gendered attitudes, stereotyping, and sexism; gendered contexts, culture, and power; the intersections of gender with race, class, sexual orientation, age, and other statuses and identities; body image; violence; gender (including masculinities) and feminist identities; human sexuality; communication studies; work and organizations; gendered development across the life span or life course; mental, physical, and reproductive health and health care; sports; interpersonal relationships and attraction; activism and social change; economic, political, and legal inequities; and methodological challenges and innovations in doing gender research.

The journal also publishes invited book reviews that address gender-relevant topics.

×

British Journal of Criminology (BJC; Reviewing Paper 4)



About the Journal

The British Journal of Criminology: An International Review of Crime and Society is one of the world's top criminology journals. It publishes work of the highest quality from around the world and across all areas of criminology.

BJC is a valuable resource for academics and researchers in crime, whether they be from criminology, sociology, anthropology, psychology, law, economics, politics or social work, and for professionals concerned with crime, law, criminal justice, politics, and penology. In addition to publishing peer-reviewed articles, *BJC* contains a substantial book review section.

The *Journal* welcomes submissions from a variety of perspectives focusing on crime and society; and especially articles written from sociological, historical, philosophical, geographical, psychological, jurisprudential, cultural, political, or policy standpoints. The interests of the extensive Editorial and International Advisory Boards are catholic, neither narrowly ideological nor limited to rigid conceptions of what criminology either should be, or is currently, about.

Whilst the journal endeavours to be as inclusive as possible in terms of its content, its aim is also to publish the best work currently ongoing within the discipline. The two main criteria according to which articles submitted for publication will be assessed are: the degree to which the article contributes new knowledge to an understanding of crime and society; the overall quality of the argument and its presentation.

Appendix Four: Copyright Statement

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1

Appendix — Acknowledgements:

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Appendix Five: Copy of Paper 1 as Published in JOEX

To access supplementary materials see Technical Appendix in Chapter 4, and the CaTIS images, citations, and instructions in Appendix Ten

PLEASE NOTE: IN THE ELECTRONIC FILE VERSION THE NEXT SIXTEEN PAGES ARE INTENTIONALLY LEFT BLANK FOR PRINTER INCLUSION OF THE JOEX PDF.
Appendix Six: Editorial Correspondence Paper 1

Correspondence is presented in chronological order. The oldest correspondence is presented first, and the more recent correspondence appears last.

Cover letter for initial submission. This letter was sent as part of the submission to the *Journal of Experimental Criminology (JOEX)*.

24th January 2017

Dear Ms Somerville,

Re: Manuscript submission to the Journal of Experimental Criminology

Thank you for reviewing this manuscript "The Crime and Threat Image Set (CaTIS): Evaluating and validating a stimulus set to investigate fear of crime" for publication in the *Journal of Experimental Criminology*. It presents a novel approach to investigating the fear of crime. For this research, we developed, evaluated, and validated a set of crime and threat images. We refer to the final set of images as the Crime and Threat Image Set (CaTIS).

We hope readers are interested in the innovative and experimental methods we have employed to investigate a central criminological research question, and enticed to apply the CaTIS in their own research. In using the CaTIS we discerned new and interesting insights into traditional measures of fear of crime (e.g., Jackson 2006). We hypothesised—and found evidence—that fear of crime is not uniquely about crime, but that this fear reflects broader and more general fears.

We have not submitted this manuscript for consideration elsewhere.

We look forward to your response and feedback on this manuscript. I can be contacted via phone ([removed]) or email (<u>mnoon@swin.edu.au</u>).

Yours sincerely,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology **Review and resubmit decision.** Initial notification of a review and resubmit decision, including reviewer comments.

From: em.joex.1d.53172c.9de7c1c7@editorialmanager.com
<em.joex.1d.53172c.9de7c1c7@editorialmanager.com> on behalf of Lorraine Mazerolle
<em@editorialmanager.com>
Sent: Wednesday, May 10, 2017 12:30 PM
To: Michelle Noon
Subject: JOEX-17-00003: Your manuscript entitled The Crime and Threat Image Set (CaTIS): Evaluating and validating a stimulus set to investigate fear of crime

CC: uqjoex@uq.edu.au, jbeaudry@swin.edu.au, aknowles@swin.edu.au

Ref.: Ms. No. JOEX-D-17-00003 The Crime and Threat Image Set (CaTIS): Evaluating and validating a stimulus set to investigate fear of crime Journal of Experimental Criminology

Dear Ms Noon,

Thank you for submitting your paper titled "The Crime and Threat Image Set (CaTIS): Evaluating and validating a stimulus set to investigate fear of crime." Associate Editor, Emma Antrobus, and I have also reviewed your paper and considered the three peer reviews. My decision is to ask that you revise your paper and resubmit your paper in a shortened, Short Report format (up to 4000 words in total).

You will see from the reviewers' comments that they have spent considerable time reviewing the paper and providing you with some excellent feedback. When you prepare your paper as a Short Report, I urge you to pay attention to the reviewer comments. You will also have to shorten your background literature section extensively and pay attention to presenting the methodological aspects of the study that the reviewers find innovative. You may want to revisit your paper title to make it more reflective of the experimental and exploratory nature of your study. You are welcome to include a technical appendix for supporting material. A technical appendix would be published online only.

The reviewers' comments can be found at the end of this email or can be accessed by following the provided link.

[link removed]

When revising your work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript.

Your revision is due by 7 August 2017. To submit a revision, go to <u>http://joex.edmgr.com/</u> and log in as an Author. You will see a menu item called 'Submissions Needing Revision'. You will

find your submission record there. Please make sure to submit your editable source files (i.e. Word, TeX).

Thank you for considering the Journal of Experimental Criminology. I very much encourage you to consider revising and resubmitting this paper as a Short Report to JOEX.

Yours sincerely

Lorraine Mazerolle, PhD Editor-in-Chief Journal of Experimental Criminology

Reviewers' comments:

Reviewer #1: This is an interesting study that uses experimental methods to validate a new battery of photos designed to be used in fear of crime research, distinguishing pictures that depict, threat, crime, and threat and crime. In general this is a good quality submission, and the author(s) provide a thorough assessment of their new instrument. However, I was not fully convinced by how well they had represented the different photo categories - e.g. the threat category is more specifically threat of animals. I also found some of the description of the results rather difficult to follow, in particular from page 18 it was not always clear precisely what the sample being analysed was - photos, or people? And a more comprehensive multivariate analysis strategy may have been more appropriate.

The literature section is generally clear, and does a good job of motivating the research. However, I was surprised that the author(s) did not provide any reference to the research on perceptions of disorder using photo-elicitation from Yang and Pao (2015),

The author(s) could usefully say more about the objectives behind the selection of photos. Some of the examples discussed seem rather ambiguous - e.g. a policeman with a child is not obviously crime related. Others do not necessarily tap into the broader concepts that well e.g. all threat items are actually related to threat from animals. A more critical appraisal of the photo selection process, and the limitations of the labels applied, would be useful to include.

The author(s) describes (on page 8) preliminary analyses showing some statements were clearer for respondents. What preliminary analysis was this?

A reasonably clear discussion is provided of the results from the image evaluation studies, although I was not particularly surprised at the high level of alignment identified for some types of photo - given the range of pictures described (e.g. neutral pictures, animal threats). It was a little surprising that no efforts were made to statistically evaluate the levels of alignment, perhaps with something akin to an inter-rater reliability assessment.

In the image evaluation study there was quite a reliance on the use of scales, however it is not clear how these were constructed. The reported cronbach's alpha values suggest that these are simply summed scales. This is not a particularly robust approach to scale construction, and I wondered whether the author(s) had considered a factor analysis.

Figure 2. It looks to me as though there is a third image (in top left quadrant) that is incorrectly classified as threat and crime.

Page 17. When discussing the relationships between threat and crime the author(s) make reference to prior expectations, however these were not clearly outlined. It would be helpful to spell these out in the text somewhere.

I found the description of some of the results rather difficult to follow. Specifically, it was not always clear what models were being estimated, and on what level of data (e.g. respondent or photo). It would be helpful if the author(s) adjusted this section to make it more accessible. For example, it is not entirely clear what is being correlated on page 18. Can the author(s) explain this more clearly? Is it the fear, threat and crime ratings at image level (e.g. n=78)? Or the mean fear, threat and crime ratings at the person level (n=178)? Or something else?

The same is true when connections to other survey items are mentioned (e.g. table 2 and table 3). And I would have anticipated that a multiple regression would be included here, rather than just presenting bivariate correlations.

What do the author(s) make of the significant negative correlation between neutral photos and perceptions of safety? And between neutral photos and anxiety (before distinguishing low/high anxiety)?

The points in the discussion on page 20 are now well known. Since the earliest fear of crime studies, many have argued that they are really picking up on generalized anxieties. This literature should be highlighted here.

Yang, S-M., and Pao, C-C. (2015). Do we "see" the same thing? An experimental look into the black box of disorder perception. Journal of Research in Crime and Delinquency. 52(4): 534-566.

Reviewer #2: Overall, this paper provides an interesting contribution to the methodological literature on the fear of crime, by developing and testing a new instrument, namely CaTIS, that can be used to enhance experimental research in this area.

Its second objective, however, is not adequately met. This refers to the exploration of associations between CaTIS and fear of crime. As explained in more detail in the comments below, this is not only for substantive reasons, but also for design-related reasons, which render the arguments on the impact of CaTIS on fear of crime far-fetched.

Therefore, before the paper is accepted for publication in the current journal, some important changes are required in relation to the framing of the main objectives (I suggest more emphasis on the methodological aspect), and the presentation of the results. Please find below general and more specific comments on the required changes.

1). General conceptual and methodological points

Overall, the methodological component of the study is better framed and developed compared with its substantive one. From example, the objective of developing and testing an instrument, such as CaTIS, that can be used in experimental research on fear of crime is adequately achieved (see Studies 1 & 2). The objective, however, that involved the exploration of the impact of different types of images on fear of crime can be considered to not be met (see Study 3). This is because there seems to be a confusion in the framing of the rationale between the following two tasks: a). looking at the impact of images (that might involve or not crime and the crime-threat) on fear of crime to suggest that exposure to such images increase on average fear of crime reactions; and b). looking at associations between images with

different content and fear of crime to suggest that threat images are more likely to be related (but not cause) to fear of crime reactions compared with crime images.

The current study seems to do the latter; however at times (see specific comments below) the narrative appears to suggest the former. The former would require, for instance, a different experimental design and analysis, where participants' fear of crime would be measured prior to the exposure to the CaTIS and again after the exposure, and the fear of crime of crime scores would be compared across the different types of images.

Considering that experimental methodologies are not often employed in fear of crime, developing and validating a tool that can be used in such research is an important endeavour. This study achieves this to a significant degree, and so it might be better to highlight more this objective in the narrative of the paper.

2). General content-related and structural points

- Very often 'fear' is used instead of 'fear of crime'. This can be confusing, especially because the paper also refers to psychological literature on wider fears, and so at times it is unclear whether the reference pertains to the former or to the latter. Relevant changes should be made throughout the paper.

- Some arguments need to be less derogatory, by simply softening the wording. See specific comments below.

- In study 3, not all of the measures that are presented in the 'measures' section are discussed in the analysis section (e.g., the social desirability scale and the victimization measures).

3). Specific comments/suggested edits:

- Abstract: First line in the 'objectives' part> 'surveys' instead of 'self-report questionnaires'. Methodologically speaking, it is the survey that is the dominant approach in fear of crime research; this involves structured questionnaires in terms of method, but they not necessarily of a self-report nature.

- Abstract: Last line in the 'objectives' part> 'participants fear reports' should be 'fear of crime reports'. As mentioned above, similar changes should be made throughout the paper; so there would be no further comments on this.

- In text citations should change as follows: e.g., (Fisher 2016) should be (Fisher, 2016). Similar changes should be made throughout the paper; so there would be no further comments on this.

- At times the linkages between the arguments raised are not clear. For exampe, in the second paragraph of the introduction some reframing is needed as the link between the the argument "fear of crime engenders...mental health" and "That said,...is counter-intuitive" is not clear.

- The argument at the semi-last paragraph of the introduction that "other fear of crime measures...in the literature" is not exactly rights. See for, example, the measures that are used in the ICVS, EU ICS, Crime Survey for England and Wales, which have been used in all of the rounds of these studies. The framing could simply be softened here.

- Three lines to the end of the introduction (Garofalo, 1981)> More references should be added here as the methodological literature that discusses these issues is very rich. See, for example, Farrall, 2004; Hough, 2004; Farrall et al., 1997.

- Section entitled "Fear of crime... or Fear of the Threat of crime?"> Despite the titles, this section focuses on non-criminological literature that explores fear. There seems to be the following confusion here. Fear of crime literature has explored the assumption that fear might not be the outcome of immediate crime incidents but of the criminal threat (see Farrall et al., 2009; Jackson, 2004). This is, however, conceptually different from suggesting that fear of crime is related to wider fears and risks; this has also been examined in criminological literature (see Hirtenlehner & Farrall, 2013). Some reframing is thus needed here to make the argument more consistent.

- Page 7. The argument that "Previous research... as a response to threat" is rather derogatory. See Farrall et al., 2009; Gray, 2008. Reframing is required.

- In Study 1, the imbalance in the numbers of the pictures of the different categories should be commented on.

- Study 1, "Procedure" section> The "J. Jackson's (2006) Fear of crime measure... the Policing Satisfaction (ABS, 2014) measure" seems to suggest that these are some kind of 'standardized' measures. These measures might be often used in fear of crime research, but can not be considered to be 'standardized', and thus further descriptions is required for their presentation here.

- Study 2: There is no reference to the sampling strategy, but only to the sample and some of its characteristics. This should be added.

- P. 12; "Image validation" should be entitled "Study 3" for consistency with previous sections. Similar changes should be made throughout the paper; so there will be no further comments on this.

- Overall, the objectives of study 3 (see "If fear of crime...we only report exceptions." are unclear to me.

- Study 3: There is no reference to the sampling strategy, but only to the sample and its characteristics. This should be added.

- Study 3 - "Measure": "...and other relevant covariates". Relevant based on what? - Study 3 - P. 14 - "J. Jackson's (2006) Fear of crime measure": Using Cronbach's alpha here seems to suggest that the fear of crime measures that were used can be seen as one conceptually. However, this is not the case in existing criminological literature (and certaintly not in the source that has been cited here). The first item is considered to measure the affective component of the fear of crime (namely, worry about victimization), whereas the other three items that were used are considered to measure the cognitive component of the fear of crime (i.e., risk perception). See Jackson, 2004, 2011; Jackson & Gouseti, 2010. Changes should be made here accordingly.

- Study 3- P. 14 - "Anxiety": Reference should be added here.

- Study 3- P. 17 - "As predicted, threat...than anticipated": It is not clear where does this assumption come from.

- Study 3- P. 18: The content and the purpose of the interaction that was tested are not clear.

- Study 3- P. 19 - "Comparison to traditional fear of crime measures": What is the substantive point of this analysis?

- Study 3- P. 20 - "Discussion": The framing of the results is unclear.

- General discussion - P. 20 - Last sentence "A major implication...": Why is it assumed that fear of crime research has not explored threat as well as crime? See Ferraro, 1995; Jackson, 2011; Hirtenlehner & Farrall, 2013; Warr, 1985

Reviewer #3: JOEX-D-17-00003, The Crime and Threat Image Set (CATIS): Evaluating and validating a stimulus set to investigate fear of crimen offers an interesting and novel analysis of the phenomenon of fear of crime through the use of an own set of images (methodology exports from experimental research for the treatment of, for instance, phobias). Starting from a critique of a traditional approach to the phenomenon of fear of crime, the authors develop a research, also written in a very clear, methodologically complete way.

However, some suggestions for improvement of the manuscript may be noted:

1. Regarding formal aspects: I recommend yo review the various citation errors throughout the text (eg J. Jackson 2006). In particular, I recommend the use of the latest APA citation version (Sixth Edition).

2. Regarding bibliographical issues:

2.1. There is a very superficial and disorganized review of the main literature on the phenomenon of fear of crime and its measurement. Similarly, the author's position on literature is not clear.

2.2. On the other hand, the section dedicated to the processes of induction of fear is shortly developed, since only a study of 50 years ago has been referenced, being one of the areas of cognitive neuroscience more fruitful. In particular, regarding of learning of fear field.2.3. There is a lack of further study in the literature on how crime anxieties is related to other types of anxiety and vice versa.

2.4. Much space is devoted to the development of the "experimental research using images" section, leaving completely aside the justification in the use of Jackson's (2006) instrument and "The Australian Bureau of Statistics (ABS 2014) Perceptions of Safety measure", in front of other instruments.

3. Concerning methodological and discussion questions:

3.1. In studies 1 and 2, in the case of the university population, I am concerned about the representativeness of the results, as well as the comparability with the results of the researchers to do the concordance analyzes. Could you explain this better?3.2. I agree with the authors that it is possible to assess the threat in different groups of images, since it is a cognitive dimension of the phenomenon. However, in the case of fear, is really the emotional, and not cognitive, dimension of fear that being measured? I would like

3.3. Finally, although it is always appreciated that they include a section of limitations, I would like to have more discussion about the problems of deriving results on an emotional phenomenon from an eminently cognitive research paradigm like yours.

In short, this article could, once improved, offer the opportunity to JOEXC to generate new debates on the plural nature of a phenomenon as important in Criminology as the fear of crime. At the same time it can be a good focus of creativity for new studies because of its easy replicability.

you to explain it better.

Response to Reviewers Comments. The version we resubmitted with these comments was published with no further changes, so it is not included here.

Lorraine Mazerolle, PhD Editor-in-Chief Journal of Experimental Criminology

22nd July, 2017

Dear Dr Mazerolle,

Re: Resubmission of JOEX-D-17-00003 The Crime and Threat Image Set (CaTIS) by Noon, Beaudry and Knowles to the Journal of Experimental Criminology.

Thank you reviewing our manuscript, now titled: *The Crime and Threat Image Set* (*CaTIS*): A validated stimulus set to experimentally explore fear of crime. We greatly appreciate the time and expert advice provided by yourself, the associate editor, and the three reviewers. Our responses to the reviewers' comments follow. We ask that you consider the extensively-reworked manuscript as a Short Report with a corresponding Technical Appendix.

Kind regards,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology <u>mnoon@swin.edu.au</u> [phone number removed]

Response to Reviews

Editor's comments:

You will see from the reviewers' comments that they have spent considerable time reviewing the paper and providing you with some excellent feedback. When you prepare your paper as a Short Report, I urge you to pay attention to the reviewer comments. You will also have to shorten your background literature section extensively and pay attention to presenting the methodological aspects of the study that the reviewers find innovative. You may want to re-visit your paper title to make it more reflective of the experimental and exploratory nature of your study. You are welcome to include a technical appendix for supporting material. A technical appendix would be published online only.

Thank you for the considered feedback—it has enhanced the clarity and quality of the manuscript. We have cut down the length of the manuscript to 3,874 words (excluding abstract, references, tables, and figures), included more emphasis on the exploratory and experimental nature of the study, and revised the title of the study. We have also created a Technical Appendix for supporting materials.

Reviewers' comments:

Reviewer #1:

1.1 This is an interesting study that uses experimental methods to validate a new battery of photos designed to be used in fear of crime research, distinguishing pictures that depict, threat, crime, and threat and crime. In general this is a good quality submission, and the author(s) provide a thorough assessment of their new instrument. However, I was not fully convinced by how well they had represented the different photo categories - e.g. the threat category is more specifically threat of animals. I also found some of the description of the results rather difficult to follow, in particular from page 18 it was not always clear precisely what the sample being analysed was - photos, or people? And a more comprehensive multivariate analysis strategy may have been more appropriate.

Thank you for your interest in this study. We address these comments when you elaborated on them below.

1.2 The literature section is generally clear, and does a good job of motivating the research. However, I was surprised that the author(s) did not provide any reference to the research on perceptions of disorder using photo-elicitation from Yang and Pao (2015),

Thank you for pointing us to Yang and Pao (2015); we now include it on page 4.

1.3 The author(s) could usefully say more about the objectives behind the selection of photos. Some of the examples discussed seem rather ambiguous - e.g. a policeman with a child is not obviously crime related. Others do not necessarily tap into the broader concepts that well - e.g. all threat items are actually related to threat from animals. A more critical appraisal of the photo selection process, and the limitations of the labels applied, would be useful to include.

More information about how we selected these images is presented in the Technical Appendix (page 4).

1.4 The author(s) describes (on page 8) preliminary analyses showing some statements were clearer for respondents. What preliminary analysis was this?

See page 1 of the Technical Appendix.

1.5 A reasonably clear discussion is provided of the results from the image evaluation studies, although I was not particularly surprised at the high level of alignment identified for some types of photo - given the range of pictures described (e.g. neutral pictures, animal threats). It was a little surprising that no efforts were made to statistically evaluate the levels of alignment, perhaps with something akin to an inter-rater reliability assessment.

We did not calculate this statistic given the use of multiple raters and different scales for researchers and participants. We used the evaluation studies (Studies 1 and 2) to identify images with perfect inter-rater reliability (that is, alignment between participants' ratings and researchers' classifications). We achieved alignment for 80 of the 178 evaluated images that we then used in the validation study (Study 3). We have made this clearer on page 5.

1.6 In the image evaluation study there was quite a reliance on the use of scales, however it is not clear how these were constructed. The reported cronbach's alpha values suggest that these are simply summed scales. This is not a particularly robust approach to scale construction, and I wondered whether the author(s) had considered a factor analysis.

Our focus was not on revalidating the Fear of Crime and Perceptions of Safety measures (e.g. Jackson [2006], ABS [2013]). Nonetheless, we did revise our approach to the Fear of Crime measure (see Comment 2.24).

1.7 Figure 2. It looks to me as though there is a third image (in top left quadrant) that is incorrectly classified as threat and crime.

Thank you for pointing this out; we revised this poor choice of symbol (see Figure 2).

1.8 Page 17. When discussing the relationships between threat and crime the author(s) make reference to prior expectations, however these were not clearly outlined. It would be helpful to spell these out in the text somewhere.

We have added more specific hypotheses (see page 8). We have also removed references to any other "predictions" or "expectations" (e.g., changes on page 9–13).

1.9 I found the description of some of the results rather difficult to follow. Specifically, it was not always clear what models were being estimated, and on what level of data (e.g. respondent or photo). It would be helpful if the author(s) adjusted this section to make it more accessible. For example, it is not entirely clear what is being correlated on page 18. Can the author(s) explain this more clearly? Is it the fear, threat and crime ratings at image level (e.g. n=78)? Or the mean fear, threat and crime ratings at the person level (n=178)? Or something else? The same is true when connections to other survey items are mentioned (e.g. table 2 and table 3).

We reworked this section to provide further clarification of this point. See pages 9–13.

1.10 I would have anticipated that a multiple regression would be included here, rather than just presenting bivariate correlations.

We report bivariate correlations because we were interested in relationships between variables rather than the predictive value of variables.

1.11 What do the author(s) make of the significant negative correlation between neutral photos and perceptions of safety? And between neutral photos and anxiety (before distinguishing low/high anxiety)?

We now address this in the general discussion (see page 16).

1.12 The points in the discussion on page 20 are now well known. Since the earliest fear of crime studies, many have argued that they are really picking up on generalized anxieties. This literature should be highlighted here.

We now discuss this literature more thoroughly (see page 3–4).

Reviewer #2:

2.1 Overall, this paper provides an interesting contribution to the methodological literature on the fear of crime, by developing and testing a new instrument, namely CaTIS, that can be used to enhance experimental research in this area.

We appreciate the reviewer's interest in the utility of the CaTIS.

2.2 Its second objective, however, is not adequately met. This refers to the exploration of associations between CaTIS and fear of crime. As explained in more detail in the comments below, this is not only for substantive reasons, but also for design-related reasons, which render the arguments on the impact of CaTIS on fear of crime far-fetched.

We have made changes through the text (e.g., see abstract, page 2) to make our intention clearer. We did not attempt to explore directional relationships of the CaTIS on traditional fear of crime measures, and have clarified this throughout the manuscript.

2.3 Therefore, before the paper is accepted for publication in the current journal, some important changes are required in relation to the framing of the main objectives (I suggest more emphasis on the methodological aspect), and the presentation of the results.

Please find below general and more specific comments on the required changes.

We address these points below.

2.4 General conceptual and methodological points Overall, the methodological component of the study is better framed and developed compared with its substantive one. From example, the objective of developing and testing an instrument, such as CaTIS, that can be used in experimental research on fear of crime is adequately achieved (see Studies 1 & 2). The objective, however, that involved the exploration of the impact of different types of images on fear of crime can be considered to not be met (see Study 3). This is because there seems to be a confusion in the framing of the rationale between the following two tasks: a). looking at the impact of images (that might involve or not crime and the crime-threat) on fear of crime to suggest that exposure to such images increase on average fear of crime reactions; and b). looking at associations between images with different content and fear of crime to suggest that threat images are more likely to be related (but not cause) to fear of crime reactions compared with crime images.

The current study seems to do the latter; however at times (see specific comments below) the narrative appears to suggest the former. The former would require, for instance, a different experimental design and analysis, where

participants' fear of crime would be measured prior to the exposure to the CaTIS and again after the exposure, and the fear of crime of crime scores would be compared across the different types of images.

Thanks for alerting us to this point of confusion. We were certainly interested in the latter, and have clarified our objective throughout the manuscript (see pages 4-5).

2.5 Considering that experimental methodologies are not often employed in fear of crime, developing and validating a tool that can be used in such research is an important endeavour. This study achieves this to a significant degree, and so it might be better to highlight more this objective in the narrative of the paper.

Thank you. We have made this point clearer throughout.

2.6 General content-related and structural points

- Very often 'fear' is used instead of 'fear of crime'. This can be confusing, especially because the paper also refers to psychological literature on wider fears, and so at times it is unclear whether the reference pertains to the former or to the latter. Relevant changes should be made throughout the paper.

At times, we do refer only to fear ratings, and this is when participants are rating the CaTIS images. We do not use fear of crime in this instance, because only half of the images are crime-related. We have made edits throughout for consistency and clarity (e.g., see Table 3).

2.7 Some arguments need to be less derogatory, by simply softening the wording. See specific comments below.

Our apologies, we did not intend to be derogatory. We've reworked the manuscript with a keen eye for this tone, making changes throughout, and to ensure we appropriately acknowledged the breadth and depth of the work to date. Please also see our response to Comment 2.16.

2.8 In study 3, not all of the measures that are presented in the 'measures' section are discussed in the analysis section (e.g., the social desirability scale and the victimization measures).

Those measures are beyond the scope of the evaluation and validation of the CaTIS. For transparency, we report the use of these measures in the Technical Appendix (page 3). Rather than detract from the focus of this research, we have encouraged readers to contact the first author for those results.

2.9 Specific comments/suggested edits:

- Abstract: First line in the 'objectives' part> 'surveys' instead of 'self-report questionnaires'. Methodologically speaking, it is the survey that is the dominant approach in fear of crime research; this involves structured questionnaires in terms of method, but they not necessarily of a self-report nature.

We have made that change to the Abstract (page 2) and throughout.

2.10 Abstract: Last line in the 'objectives' part> 'participants fear reports' should be 'fear of crime reports'. As mentioned above, similar changes should be made throughout the paper; so there would be no further comments on this.

As per Comment 2.6, we have made changes throughout to reduce ambiguity. Regarding this specific change, we have altered this section for clarity, which also addresses Comments 2.2 through 2.4 above.

2.11 In text citations should change as follows: e.g., (Fisher 2016) should be (Fisher, 2016). Similar changes should be made throughout the paper; so there would be no further comments on this.

Although not APA style, the citations are in line with the style for this journal.

2.12 At times the linkages between the arguments raised are not clear. For exampe, in the second paragraph of the introduction some reframing is needed as the link between the the argument "fear of crime engenders...mental health" and "That said,...is counter-intuitive" is not clear.

We have reworked the final version to make stronger links between sentences and arguments.

2.13 The argument at the semi-last paragraph of the introduction that "other fear of crime measures...in the literature" is not exactly rights. See for, example, the measures that are used in the ICVS, EU ICS, Crime Survey for England and Wales, which have been used in all of the rounds of these studies. The framing could simply be softened here.

Unfortunately we had to remove these sections to meet the word count.

2.14 Three lines to the end of the introduction (Garofalo, 1981)> More references should be added here as the methodological literature that discusses these issues is very rich. See, for example, Farrall, 2004; Hough, 2004; Farrall et al., 1997.

We removed this section, as per Comment 2.13.

2.15 Section entitled "Fear of crime... or Fear of the Threat of crime?"> Despite the titles, this section focuses on non-criminological literature that explores fear. There seems to be the following confusion here. Fear of crime literature has explored the assumption that fear might not be the outcome of immediate crime incidents but of the criminal threat (see Farrall et al., 2009; Jackson, 2004). This is, however, conceptually different from suggesting that fear of crime is related to wider fears and risks; this has also been examined in criminological literature (see Hirtenlehner & Farrall, 2013). Some reframing is thus needed here to make the argument more consistent.

We have made significant changes to this section to reflect these comments. To address the reviewer's concerns, the shortened introduction now explores the narrow and broad explanations of fear of crime (see page 4).

2.16 Page 7. The argument that "Previous research... as a response to threat" is rather derogatory. See Farrall et al., 2009; Gray, 2008. Reframing is required.

We reframed the introduction (see page 5).

2.17 In Study 1, the imbalance in the numbers of the pictures of the different categories should be commented on.

Please see the Technical Appendix (page 4).

2.18 Study 1, "Procedure" section> The "J. Jackson's (2006) Fear of crime measure... the Policing Satisfaction (ABS, 2014) measure" seems to suggest that these are some kind of 'standardized' measures. These measures might be often used in fear of crime research, but can not be considered to be 'standardized', and thus further descriptions is required for their presentation here.

We provide reasons for the use of both measures in the Technical Appendix (page 1-2) and removed the suggestion that these are standardized measures.

2.19 Study 2: There is no reference to the sampling strategy, but only to the sample and some of its characteristics. This should be added.

We clarified that we used a convenience sampling technique (see page 5).

2.20 P. 12; "Image validation" should be entitled "Study 3" for consistency with previous sections. Similar changes should be made throughout the paper; so there will be no further comments on this.

We agree. See page 8.

2.21 Overall, the objectives of study 3 (see "If fear of crime...we only report exceptions." are unclear to me.

We have reworked this section (see page 8).

2.22 Study 3: There is no reference to the sampling strategy, but only to the sample and its characteristics. This should be added.

This change has been made as per Comment 2.19.

2.23 Study 3 - "Measure": "...and other relevant covariates". Relevant based on what?

We have clarified these comments (see the Technical Appendix).

2.24 Study 3 - P. 14 - "J. Jackson's (2006) Fear of crime measure": Using Cronbach's alpha here seems to suggest that the fear of crime measures that were used can be seen as one conceptually. However, this is not the case in existing criminological literature (and certaintly not in the source that has been cited here). The first item is considered to measure the affective component of the fear of crime (namely, worry about victimization), whereas the other three items that were used are considered to measure the cognitive component of the fear of crime (i.e., risk perception). See Jackson, 2004, 2011; Jackson & Gouseti, 2010. Changes should be made here accordingly.

The reviewer is correct, we did collapse the items across Jackson's measure. Given this feedback, we now present both the total scale and the sub-scale of crime worry (see page 12).

2.25 Study 3- P. 14 - "Anxiety": Reference should be added here.

We have changed the heading/s to be consistent with the other sections, please see the Technical Appendix (page 2).

2.26 Study 3- P. 17 - "As predicted, threat...than anticipated": It is not clear where does this assumption come from.

We clarified our hypotheses on page 8 and made changes to reflect these hypotheses throughout (e.g., page 10).

2.27 Study 3- P. 18: The content and the purpose of the interaction that was tested are not clear.

We have clarified this on page 12.

2.28 Study 3- P. 19 - "Comparison to traditional fear of crime measures": What is the substantive point of this analysis?

We have clarified this on page 12–13.

2.29 Study 3- P. 20 - "Discussion": The framing of the results is unclear.

See page 13–14 for changes.

2.30 General discussion - P. 20 - Last sentence "A major implication...": Why is it assumed that fear of crime research has not explored threat as well as crime? See Ferraro, 1995; Jackson, 2011; Hirtenlehner & Farrall, 2013; Warr, 1985

We have significantly changed the manuscript (including the discussion) to reflect these important contributions. Please see pages 14–16.

Reviewer #3:

3.1 JOEX-D-17-00003, The Crime and Threat Image Set (CATIS): Evaluating and validating a stimulus set to investigate fear of crimen offers an interesting and novel analysis of the phenomenon of fear of crime through the use of an own set of images (methodology exports from experimental research for the treatment of, for instance, phobias). Starting from a critique of a traditional approach to the phenomenon of fear of crime, the authors develop a research, also written in a very clear, methodologically complete way. However, some suggestions for improvement of the manuscript may be noted:

Regarding formal aspects: I recommend yo review the various citation errors throughout the text (eg J. Jackson 2006). In particular, I recommend the use of the latest APA citation version (Sixth Edition).

We made the corrections but retained the specific requirements of this journal.

3.2 Regarding bibliographical issues:

There is a very superficial and disorganized review of the main literature on the phenomenon of fear of crime and its measurement. Similarly, the author's position on literature is not clear.

On the other hand, the section dedicated to the processes of induction of fear is shortly developed, since only a study of 50 years ago has been referenced, being one of the areas of cognitive neuroscience more fruitful. In particular, regarding of learning of fear field.

As per the editor's request we have cut the introduction, which now focuses on the criminological discussions regarding threat, crime, and fear. Please see Comments 2.15 and 2.30, and page 3 onwards.

3.3 There is a lack of further study in the literature on how crime anxieties is related to other types of anxiety and vice versa.

We are constrained by the word limit so have not been able to include more information here.

3.4 Much space is devoted to the development of the "experimental research using images" section, leaving completely aside the justification in the use of Jackson's (2006) instrument and "The Australian Bureau of Statistics (ABS 2014) Perceptions of Safety measure", in front of other instruments.

We have now indicated our rationale for the use of both measures in the Technical Appendix (see page 2).

3.5 Concerning methodological and discussion questions: 3.1. In studies 1 and 2, in the case of the university population, I am concerned about the representativeness of the results, as well as the comparability with the results of the researchers to do the concordance analyzes. Could you explain this better?

Regarding the comparability issue: see response to Comment 1.5.

Regarding representativeness: please see page 14–15.

3.6 I agree with the authors that it is possible to assess the threat in different groups of images, since it is a cognitive dimension of the phenomenon. However, in the case of fear, is really the emotional, and not cognitive, dimension of fear that being measured? I would like you to explain it better.

Finally, although it is always appreciated that they include a section of limitations, I would like to have more discussion about the problems of deriving results on an emotional phenomenon from an eminently cognitive research paradigm like yours.

Please see page 15.

3.7 In short, this article could, once improved, offer the opportunity to JOEXC to generate new debates on the plural nature of a phenomenon as important in Criminology as the fear of crime. At the same time it can be a good focus of creativity for new studies because of its easy replicability.

Thank you for your positive feedback.

Final Decision from JOEX. The new version of the Manuscript was accepted with no further changes and published in December 2017.

From: em.joex.1d.55dc8e.29c24d00@editorialmanager.com
<em.joex.1d.55dc8e.29c24d00@editorialmanager.com> on behalf of Lorraine Mazerolle
<em@editorialmanager.com>
Sent: Wednesday, September 13, 2017 3:12 PM
To: Michelle Noon
Subject: JOEX-D-17-00003: Your manuscript entitled The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime

CC: uqjoex@uq.edu.au, jbeaudry@swin.edu.au, aknowles@swin.edu.au

Ref.: Ms. No. JOEX-D-17-00003R1 The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime Journal of Experimental Criminology

Dear Ms Noon,

Thank you for submitting your revised manuscript as a Short Report. I appreciate your embracing the Short Report format and your detailed responses to the reviewers' comments. Associate Editor, Dr Emma Antrobus, and I have reviewed your revised paper and the second peer review (the reviewer's comments are at the end of this email), and I am pleased to accept your paper for publication in the Journal of Experimental Criminology.

Before I send your manuscript to production, could I ask if you are able to provide a full set of the images used, in colour. I think the addition of the full set of images would be useful for our readers. We would add them to the online Technical Appendix. If you are able to provide the images, could you please email them to our managing editor Adele Somerville (at uqjoex@uq.edu.au) and she will upload them and send to production.

Thank you again for submitting your paper to the journal. I hope you will consider JOEX as a future outlet for your work.

With kind regards

Lorraine Mazerolle, PhD Editor-in-Chief Journal of Experimental Criminology

Reviewer #1: The author(s) have generally responded to my main criticisms, and the paper is substantially clearer than the previous draft. The shorter format of the paper is also an improvement, with relevant methodological material wisely included in the appendix.

Appendix Seven: Editorial Correspondence Paper 2

Correspondence is presented in chronological order. The oldest correspondence is presented first, and the more recent correspondence appears last.

Cover letter for initial submission. This letter was sent as part of the submission to Sex Roles.

21st June 2017

Dear Professor Yoder,

Re: Manuscript submission to *Sex Roles: A Journal of Research* and Compliance with Ethical Standards

Thank you for considering "Snakes, spiders and crime, oh my! Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)" for publication in *Sex Roles: A Journal of Research*. This single-study manuscript presents a novel approach by using crime-related and threatening images to investigate drivers of the fear of crime gender paradox.

In regards to ethical compliance:

- 1. We have not submitted this manuscript for consideration elsewhere.
- 2. As indicated in our correspondence (1st June 2017), we have submitted another manuscript describing the creation, evaluation, and validation of the CaTIS. We currently have a revise and resubmit decision from the Journal of Experimental Criminology (JEC) for that manuscript. That manuscript and the manuscript we are submitting here use the same data from the third study, but the research question and analysis is completely different (validation of the CaTIS vs. drivers of the fear of crime gender paradox).
- 3. There are no potential or actual conflicts of interest for any of the authors of this manuscript.
- 4. This research was approved by Swinburne University Human Research Ethics Committee. Our human participants provided informed consent.

We look forward to your response. As the corresponding author, I can be contacted via phone ([removed]) or email (<u>mnoon@swin.edu.au</u>).

Yours sincerely,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology **Rejection decision and invitation to resubmit.** Initial notification of a rejection decision from Sex Roles, with the suggestion to resubmit. Reviewer comments are included.

From: em.sers.0.54fe09.4b714b74@editorialmanager.com
<em.sers.0.54fe09.4b714b74@editorialmanager.com> on behalf of Sex Roles
<em@editorialmanager.com>
Sent: Saturday, August 5, 2017 1:46 AM
To: Michelle Noon
Subject: Decision on your Manuscript #SERS-D-17-00306

CC: jbeaudry@swin.edu.au, aknowles@swin.edu.au

Dear Ms Noon:

I have now received two excellent and very helpful expert reviews of your manuscript SERS-D-17-00306 titled, "Snakes, spiders, and crime, oh my! Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)," that you submitted to Sex Roles: A Journal of Research. On the basis of the reviewers' thoughtful comments as well as my own reading, I must regretfully reject this manuscript.

As you will see, the major problem we all have has to do with missing information. For me as editor, this makes making a decision difficult because I do not know if the missing information can be convincingly added. Indeed it is this uncertainty that drove my decision to reject.

Rejecting a paper generally indicates that that paper cannot be re-submitted to the rejecting journal. However, in this case, I would allow for the submission of a NEW manuscript that successfully fills in the details that the reviewers kindly and expertly detail. I also urge you to find and model similarly designed papers, making note of what they include and then translating that into your own work (and there are many such good examples in recent issues of Sex Roles -- or whatever journal you elect to target if not Sex Roles). If you do submit a new paper here, I would start the review process anew but I would build on the groundwork we laid here.

I am sorry not to send better news. However, I hope that the reviewers' comments (see below) as well as my notes (above) are helpful as you pursue publication of your work.

Please continue to think of Sex Roles as a venue for your future work.

Best wishes, Janice D. Yoder, Ph.D. Editor Sex Roles sroles@kent.edu

Comments for the Author:

Reviewer #1: The article is well-written, undoubtedly interesting and attractive due to its innovative elements. But in my personal view some key points are so briefly elaborated that could raise serious doubts about the study.

These are my main concerns:

First, there is large body of literature on the paradox, and more generally on explanations for the fear of crime and the review here is really short. Authors do not seem to locate their aims in this large amount of literature, but they could relate their proposal (fear of threat being the explanation for the paradox) within the vulnerability literature if they assume that women feel less capable of confronting a threat (or they are socialised for feeling so). This is not maybe the perspective where authors would locate themselves, but I use it as an example of the lack of effort for integrating their proposal within current literature on FOC, that could also enhance the discussion with a reflection of what results mean to this body of literature.

Recent research on FOC also points out to the relevance of the type of crime we are considering. This is particularly relevant when doing research on the paradox since the paradox does not happen for sex crimes (women are the majority of the victims in this case and also fear sex crimes more than men). Some authors have presented fear to sexual crime as an explanation for the higher fear to other crimes (the hypothesis of the "shadow of the sexual assault"). This is not considered in the study, could at least be considered a limitation?

In relation to the main hypotheses and general idea of the paper, I had a hard time understanding threat and crime as completely different concepts, particularly imagining a whole set of pictures where participant is suppose to react to crime but crime is not threatening (or at least a low-level threat...) This is also a problem for me in the method, after reading the brief description of the image set and validation process. There is a reference to a different paper (blinded for review) but we only have one example for each category and no mention to the theoretical background for developing the CaTIS. Are all the images in the "threat-only" category always natural threats? Or are other social threats (apart from crime) present in the set? Has been the literature on risk perception of natural and human-made hazards considered in any way for developing this set of threatening stimuli? The non-related-to-crime threats, were they chosen because they are known to cause more fear among women as the introduction suggests (i.e. animal phobias)? If several types of crime (violent, against property, sexual...) are present in the image set, this is not mentioned nor included in the design.

The mixed design is appropriate if the previously exposed doubts about the set of images and the 4 categories are solved.

To my knowledge, it is not correct to present the main effects in the results section, if there are interactions: once the interaction gender x threat is detected, describing the main effect of gender has no point, because now we know that women are not always more fearful, only for high-threat images. I would recommend to delete the main effect of variables that are present in an interaction.

In the discussion, again, the lack on information about the nature of threat in the study is a big problem for me. Authors' main idea is that "the gender paradox is primarily driven by differences in how men and women respond to threat rather than crime" and they also mention as a practical implication that "strategies that encourage men to better assess and manage risk of all varieties could be effective". But which are these risks of all varieties? Which is this threat women are responding to? Natural risks, human-made (i.e. pollution), social risks?? I would need a better and broader description of the set of images and how it has been developed and validated for being able to evaluate the conclusions. Also, as previously mentioned, authors make no effort for interpreting their findings from existing FOC literature. If the paradox is a particular example of a broader higher fear among women to every threat, does it provide support of any of the existing hypothesis for explaining FOC? I would like to read what they think.

Reviewer #2: I enjoyed the premise of the article-- gender differences in threat vs. crime on fear of crime. However, the delivery of the methods and the measurement of key concepts is very confusing. Because I was left with so many questions about how items were measures, the validity of coding decisions, therefore the outcome of the analyses, I can not recommend the article for

publication. I'll outline my critique in two areas: influence of sex/gender on the work and measurement of variables

Influence of sex/gender: very little attention is paid to the effect that gender as social structure has on men and women's perceptions of threat, crime or fear. This is a serious shortcoming for submission to a gender specialty journal.

Measurement of variables:

1. How were the images coded? No description of the coding process of the images and the reliability and validty checks used. This is essential as the authors suggest their images are one of a kind and do not duplicate existing work.

2. Give examples of what the images are (beyond the four exemplars provided) and how they were coded into individual categories.

3. Why would an image of a police arrest be coded "crime but low threat"? I would think for certain demographic groups, an arrest could be perceived as high threat (thus eliciting high fear).

4. I have no idea whatsoever what "image statements" are and how they are measured. What are the "five statements" to measure threat, crime-relatedness, relevance and fear underneath each CaTIS? 5 "Fear" is measured as "this scares me". Is this a standard measure of fear? How was this measure derived? Wouldn't it also be appropriate to measure avoidance behavior and corrective action as proxies for fear?

6. Which items were entered into the reliability analyses for the Chronbach's alpha for fear ratings? Readers were only given one measure of fear-- "this scares me". This section is very confusing.

Results: I don't understand the grouping of "high threat" as averaged fear ratings for threat and crime or threat only. I thought high crime (officer arresting someone) was considered "low threat" earlier?

Email response to initial decision. I sent the following response as we commenced preparing a second submission.

From: Michelle Noon
Sent: Monday, August 21, 2017 8:26 AM
To: Sex Roles
Subject: Re: Decision on your Manuscript #SERS-D-17-00306

Dear Professor Yoder,

Thanks to both you and the reviewers for clear and considered feedback. I am confident that we do have this information, and on this basis, we will look towards submitting a new paper that addresses these concerns in the future.

Kind regards,

Michelle

Cover letter for second submission. The Manuscript was resubmitted on 9th December 2017 and once Paper 1 was published. This letter was sent as part of the second submission to Sex Roles.

9th December 2017

Dear Professor Yoder,

Re: Manuscript submission to *Sex Roles: A Journal of Research* and Compliance with Ethical Standards

Thank you for inviting us to submit a new version of "Exploring the fear of crime gender paradox using the Crime and Threat Image Set (CaTIS)" for consideration of publication in *Sex Roles: A Journal of Research*. This single-study manuscript presents a novel approach by using crime-related and threatening images to investigate drivers of the fear of crime gender paradox. We have previously submitted a version of this manuscript to *Sex Roles* which was rejected with the invitation to revise key elements and submit again. Thank you again for this feedback and for the opportunity to address these issues in another submission. We have made significant revisions based on the advice provided by the reviewers and editorial team.

Regarding ethical compliance:

- 1. We have not submitted this manuscript for consideration elsewhere.
- 2. As indicated in our previous correspondence (1st June 2017), we have published another paper describing the development, evaluation, and validation of the CaTIS. This has been accepted by the Journal of Experimental Criminology (JEC) (doi: 10.1007/s11292-017-9314-2. The article can be retrieved from: https://www.researchgate.net/publication/321698737_The_Crime_and_Threat_I mage_Set_CaTIS_A_validated_stimulus_set_to_experimentally_explore_fear_o f_crime). That paper and this manuscript use the same data from the third study, but the research question and analyses are completely different (validation of the CaTIS vs. drivers of the fear of crime gender paradox).
- 3. There are no potential or actual conflicts of interest for any of the authors of this manuscript.
- 4. This research was approved by Swinburne University Human Research Ethics Committee. Our human participants provided informed consent.

We look forward to your response. As the corresponding author, I can be contacted via phone (+61 433 810 910) or email (<u>mnoon@swin.edu.au</u>).

Yours sincerely,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology
Notification of "under review" status. Sex Roles commenced reviewing the manuscript on the 14th December 2017. It remains under review at the time of thesis submission.

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Appendix Eight: Editorial Correspondence Paper 3

Correspondence is presented in chronological order. The oldest correspondence is presented first, and the more recent correspondence appears last.

Cover letter for submission. This letter was sent as part of the submission to the British Journal of Criminology.

25th January 2018

Dear Professor Walklate,

Re: Manuscript submission to *The British Journal of Criminology: An International Review of Crime and Society (BJC)*

Thank you for considering this manuscript "Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat" for publication in the *BJC*.

To explore the fear of crime gender paradox, we conducted a quasi-experiment to investigate how threat and/or crime influence men's and women's emotional reports. We found evidence that women and men respond to crime with sadness and anger rather than fear, and that gender differences in fear reports are a response to threat rather than crime.

A noted limitation of this study is that we relied on a sample of university students. Our sample was similar in age and status to an average Australian sample, as per Table 1.

Table 1

Demographic	Our sample $(N = 427)$	The Australian community
Proportion of women	54.33%	50.25% ¹
Average age	18 to 63 years, with an average age of 33 years (SD = 10.64)	37 years old ²
Born overseas	17%	28% ³

Demographics of our sample compared to the Australian community

¹http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbyCatalogue/7A40A407211F35F4CA257A220 0120EAA?OpenDocument

²http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbyCatalogue/7A40A407211F35F4CA257A220 0120EAA?OpenDocument

³http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/3412.0Main%20Features32014-

^{15?}opendocument&tabname=Summary&prodno=3412.0&issue=2014-15&num=&view=

Educational attainment	Enrolled in (but not having completed) tertiary education	Australians are also among the world's most tertiary engaged, with 46% of Australians completing tertiary education ⁴ and 52% of young people in full-time education ⁵
Workforce status		
Full-time	40%	59%
Part-time	34%	34%
Not employed	26%	7% are unemployed
		(including not engaging in
		education) ⁶

We did replicate the traditional fear of crime findings with our sample. Nonetheless, the generalisability of the results to the general population are unknown, and we wanted to flag this limitation with you given that *BJC* frequently publishes research with community samples.

We have taken pains to maintain authorial anonymity. This means that—when we have cited our previous work—we have written about it in the third person so that we can remain anonymous.

We have not submitted this manuscript for consideration elsewhere. We look forward to your response and feedback on this manuscript. I can be contacted via phone ([removed]) or email (<u>mnoon@swin.edu.au</u>).

Yours sincerely,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology

⁴http://www.afr.com/news/policy/education/australias-education-levels-well-above-world-average-20150406-1mfmtw

⁵https://www.employment.gov.au/annual-report-2016/analysis-trends-australian-labour-market ⁶http://profile.id.com.au/australia/employment-status

Notification of "under review" status. The British Journal of Criminology

commenced reviewing the manuscript on the 30th January 2018. It remains under review at the time of thesis submission.

From: British Journal of Criminology <bjc@editorialoffice.co.uk>
Sent: Tuesday, January 30, 2018 1:36 AM
To: Michelle Noon
Subject: BJC-2018-0031 Submission Confirmation

Dear Ms Noon

Re: BJC-2018-0031: Not just fear and not just crime: An experiment exploring men's and women's emotional reactions to crime and threat Thank you for your submission to the British Journal of Criminology.

Your manuscript has been received and is now out for review. You will be contacted in due course with regard to its suitability for publication and/or other comments.

We do occasionally have issues with our emails going astray. If you have not received a decision from us within 10 weeks of receiving this email, please contact us.

If you have any questions in the meantime please do not hesitate to contact our editorial office at <u>bjc@editorialoffice.co.uk</u>.

Thank you for your interest in the BJC.

Yours sincerely

Professor Sandra Walklate British Journal of Criminology

Appendix Nine: Editorial Correspondence Paper 4

Correspondence is presented in chronological order. The oldest correspondence is presented first, and the more recent correspondence appears last.

Cover letter for submission. This letter was sent as part of the submission to the Journal of Experimental Criminology.

3rd February 2018

Dear Professor Mazerolle,

Re: Manuscript submission to the Journal of Experimental Criminology (JOEX)

Thank you for considering this manuscript "Eyes wide open: Exploring men's and women's self-reported and physiological reactions to threat and crime" for publication in *JOEX*.

It has been over a decade since Sutton and Farrall (2005) called for physiological measurement to elucidate fear of crime gender dynamics. We have directly addressed this call by conducting a laboratory quasi-experiment to investigate how threat and/or crime images influenced men's and women's self-reports and physiological data. We found gender differences between self-report measures, but no statistically significant differences in men's and women's physiological reactions. We also found some correspondence between women's—but not men's—self-reports and physiological reactions. This suggests that gender differences in fear of crime may be a function of self-reporting dynamics rather than physiological activations for men, but not women.

We hope readers are interested in the innovative and experimental methods we have employed to investigate a central criminological research question. This is the first study (that we are aware of) that uses physiological measurement to investigate the fear of crime gender paradox. We are excited to implement the CaTIS in this work (Noon et al., 2017; published in JOEX), and we hope that this research builds on the pioneering efforts of JOEX in publishing physiological research that investigates the fear of crime (e.g., Castro-Toledo et al. 2017).

We have not submitted this manuscript for consideration elsewhere.

We look forward to your response and feedback on this manuscript. I can be contacted via phone (+61 433 810 910) or email (<u>mnoon@swin.edu.au</u>).

Yours sincerely,

Michelle Noon PhD (Clinical Psychology) Candidate Swinburne University of Technology



Notification of status. The manual has not been immediately rejected and is therefore Under Review.

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Appendix Ten: The Crime and Threat Image Set (CaTIS)

Crime and Threat Image Set (CaTIS) Information

[This information has been reproduced from our article in the Journal of Experimental Criminology]

The images in the CaTIS (Noon, Beaudry, & Knowles, 2017) are for research use only. Researchers must seek appropriate ethical approvals when using these images. Please cite 'Noon, M. Beaudry, J. L., and Knowles, A. (2017). The Crime and Threat Image Set (CaTIS): A validated stimulus set to experimentally explore fear of crime. *Journal of Experimental Criminology*' in any presentations or publications that use the CaTIS.

Although the researchers sourced all images from publicly available sources (see Tables 1 to 4), we request that you exercise discretion when viewing the attached files.

Trigger warning: Some of these images depict abuse (physical, mental, verbal), illicit drugs, violence and warfare (including instruments of violence, such as knives or guns), rioting, fire, corpses, skulls, skeletons, death and dying, blood, serious injury, spiders, dogs, sharks, crocodiles, and snakes.

Sources for Threat-and-Crime (TC) images

CaTIS image	Photographer	Year	Image name	Retrieved from
TCA	Noon, Michelle	2014a	Break in	n/a
TCB	Seven resist	2005	"Rauberhohle riot"	https://www.flickr.com/photos/seven_resist/7522502754
TCC	Noon, Michelle	2014b	Under the bed	n/a
TCD	Mirandala	2007	"Crime scene"	https://www.flickr.com/photos/mirandala/679385356
TCE	European External Action Service	2013a	"EUPOL Afghanistan – crime scene course for senior Afghan detectives"	https://www.flickr.com/photos/eeas/11380872583
TCF	ISOtob	2010	"Fun at the crime scene"	https://www.flickr.com/photos/photo-addict/4640065060
TCG	dvdflm	2008	"Vintage: death in the Arizona desert"	https://www.flickr.com/photos/freeparking/2540392522
ТСН	Viewminder	2012	"Controversy on the street"	https://www.flickr.com/photos/light_seeker/8246768769
TCI	Murplejane	2008	"Rage"	https://www.flickr.com/photos/murplejane/3097926093
TCJ	Zach Frailey	2013	"Kinston homicide – 2013"	https://www.flickr.com/photos/zrfraileyphotography/14732976410

Table 1 (Cont.)

CaTIS image	Photographer	Year	Image name	Retrieved from
ТСК	Fanboy30	2009	"Rebel shoots Fanboy"	https://www.flickr.com/photos/stevedave/3303394103
TCL	Adam Jones	2007	"Srebrenica massacre – exhumed grave of victims – Potocari 2007"	https://www.flickr.com/photos/adam_jones/3773250875
TCM	loriZ	2009	"Il fumettista ucciso"	https://www.flickr.com/photos/lorix/3598065314
TCN	Freedom House	2012	"Karam el-Zeitoun Massacre, Homs-Syria"	https://www.flickr.com/photos/syriafreedom/6830142168
TCO	Gerry Thomasen	2005	"Wood panel stabbing'	https://www.flickr.com/photos/gerrythomasen/13594288
ТСР	Remo Cassella	2012	"14 novembre 2012 Roma riot"	https://www.flickr.com/photos/intermundia/8189606663
TCQ	Nico Hogg	2011	"Tottenham riots"	https://www.flickr.com/photos/nicohogg/6018692165
TCR	scottmontreal	2012	"Montreal riot police at play"	https://www.flickr.com/photos/scottmontreal/7235110028
TCS	Athens.rioter	2012	"Athens_Riot_12Feb2012_2"	https://www.flickr.com/photos/76557889@N05/6872048845
TCT	Thomas Hawk	2008	"Guarding the prisoners"	https://www.flickr.com/photos/thomashawk/2345762603

Sources for Crime-only (C) images

CaTIS image	Photographer	Year	Image name	Retrieved from
CA	Andy Rudorfer	2009	"Crime night"	https://www.flickr.com/photos/bigod/3205808713/
CB	European External Action Service	2013b	"EUPOL Afghanistan – crime scene course for senior Afghan detectives"	https://www.flickr.com/photos/eeas/11380778724/
CE	Morning Calm Weekly Newspaper Installation Management	2012	"Shoplifting at exchange costs military in many ways"	https://www.flickr.com/photos/imcomkorea/6924929159/
CF	Will Keightley	2011	"Disaster area"	https://www.flickr.com/photos/feverblue/6478315519
CG	U.S. Army Garrison Yongsan	2010	"Domestic abuse prevention month"	https://www.flickr.com/photos/usag-yongsan/5031411223/in/photolist-8EBknF-8EBign-8EBjKP-8EEttC-c1Vr3W-gUDbze-gUuwXQ-dF9emw-ejFFT5-dSVXYm-c1Xred-6sGsA7-9iwDrj-9itHcp-9itHci-9iwDro-9itHc4-9iydK3-9itHcv-9iwDrG-9itHaK-9iwDrd-6sCoiz-6sCng4-6sCkQk-6sCjhV-6sGuCy-6rTF9e-5P5bL5-5NZUXk-5P5chC-5P5cGb-5P5auS-5NZVpe-9o75SQ-9o75Tb-9o75SA-9o75SL-9o75SY-nwuggc-nwvHDj-nurrz7-neZtor-7cZFVn-iifr4A-gUuwWh-oiVQbw-74cmZX-okFjHe-okXJ7v
СН	Cal OES	2011	"RAE_2649"	https://www.flickr.com/photos/calemaphotos/5662793632/
CI	Penn State	2013	"Kids dusting for fingerprints at mock investigation site"	https://www.flickr.com/photos/pennstatelive/8681610372
CJ	Vince Alongi	1991	"Points"	http://https//www.flickr.com/photos/vincealongi/7075085533/

Table 2 (Cont.)

CaTIS image	Photographer	Year	Image name	Retrieved from
СК	AlanCurran	2008	"Crime scene investigation"	https://www.flickr.com/photos/my-own-reality/3590329356/
CL	Michael Mandiberg	2010	"Drug money: Military family selling dinar"	https://www.flickr.com/photos/theredproject/4425097953/
СМ	Kaml68k -all over-	2010	"Graffiti in Wien/Vienna 2010"	https://www.flickr.com/photos/kami68k/4618680855/
CN	Anthony Citrano	2011	"LAPD Venice pursuit suspect"	https://www.flickr.com/photos/zigzaglens/6090921005/
CO	Max Lebram	2011	"Who is hiding?"	https://www.flickr.com/photos/dinohyus/6358658533/
СР	Chase Carter	2012	"Counter protest of Tea Party Rally"	https://www.flickr.com/photos/chasecarter/6936244580/
CQ	Kaml68k -all over-	2013	"Graffiti in Barcelona 201"	https://www.flickr.com/photos/kami68k/11248528113/
CR	Kaml68k -all over-	2013	"Graffiti in Barcelona 201"	https://www.flickr.com/photos/kami68k/11380582625/
CS	Kaml68k -all over-	2013	"Graffiti in Barcelona 201"	https://www.flickr.com/photos/kami68k/11380709243/
СТ	Kaml68k -all over-	2013	"Graffiti in Graz 2014"	https://www.flickr.com/photos/kami68k/13889980746/

Sources for Threat-only (T) images

CaTIS image	Photographer	Year	Image name	Retrieved from
ΤΑ	Kamla Wolf	2006	"Scary Raven"	https://www.flickr.com/photos/kamia_the_wolf/332048576/in/photolistKA9rU- acYb5H-HRfVW-eiWXkP-6KMSzm-nGyXfL-vkQts-6FwYEJ-87sK8p-5pW6vb- 6yKkX3-tQEpD-Q76aQ-7dZAoX-dK3eYJ-6CwZL1-6QRyA3-fgkC5P-tX4q7-5NGnL7- ubF9k-4YBqJP-AkSim-4HS6y-4TZjkD-8TftfQ-wG24c-3iqbzM-tk4hv-4ye8Qc- 7QncMW-53p6p-4yKN6F-krqJKz-jB9JoJ-4yeaCB-4yiobm-4yioff-4yiotE-4ye9y2- 4ye8wr-4ye9VR-4yinXW-4ye95F-4ye8Bg-4yioQf-4yipph-4yeaEF-81eBjt
TB	Malingering	2006	"The big crocodile who almost ate me's wife"	https://www.flickr.com/photos/malingering/303815795/in/photolist-sR8Rn-sR8xi- sR8HH-sR8Bu-8tRDC-sR8VH-sR8i7-sR8pB-sR8n1-sR8SQ-sR8tK-72v9SB-9YN16c- 9YQUF9-72v9SF-72v9Sz-kZebh-7dBfYd-48REAv-KYktk-cT7ui-5UdtRD-gUSBn7- gUTXxK-gUTrmG-gUSCYm-gUU29a-gUUDsT-gUThy3-sDAzV-gUSEgc-gUStw6- gUTmpE-gUSTYm-gUTgos-gUSzgb-gUVsQi-gUT3yX-gUV8wv-gUSfto-gUTP8t- gUVzGK-gUSqBt-gUUsTX-gUTWL3-gUUKKJ-gUU6QY-gUUu8T-gUVc5T-gUTnHu
TC	Lwp Kommunikacio	2004	"Capak hete (2014)"	https://www.flickr.com/photos/lwpkommunikacio/14663970488/
TD	Travelbag ltd	2013	"Great white shark in South Africa"	https://www.flickr.com/photos/98585738@N07/10346101216/in/photolist-2zJtYV- 2BFi9c-4gBAMz-9iiHZw-2FMGJo-9jfrT3-2yNhzv-54TLCU-ebH68m-gLftrs-h3m8ZS- nTSrh-2SaTnf-poQPCn-aYU1vP-cTV86-c9ES8-a4mit-b6KA3v-oHVMP8-9ifD7R- oHVPJR-9wmakR-orGMyu-2zNRwJ-e1JquV-70qBeW-9jfrTo-4B6kZu-ceo4is-388Sp3- 2S6tHz-aHoJE4-jynrtR-5gBraH-bWHNPc-2Nn4Pk-orGMzR-orGV6y-oHVQbc-38Quak- oHVLa6-oJawSh-6YQsS9-oeNrTN-9UtPPK-e3LbCQ-oHVAJT-3dp1Y1-8sXBQ1
TF	Eddie	2006	"Demondog"	https://www.flickr.com/photos/eddieburns55/120943101/in/photolist-bFSaT-r4Qjrr- 4cyhZP-EJmCR-6Cvg5-AF7aC-5mfEYX-xYcjV-4tFJJM-5NDX8s-b5ZAwg-RKaQu- ebBSM-Ab3js-8iy48y-rWuqC-daY7Er-4Hd4QC-oALNAC-235G3f-qgY4HR-A7ndz- 8PCqCw-ayDBnU-n8sAR-93m9VB-87nyh1-3UEJyy-6U4FMG-65shUk-mF18w-79jga5- zf8a4-cQBskq-bxx2TN-7tvTGu-aRsVxV-9zi9L-aQus6r-bvBECE-HFuCD-5ChPPR- 5ABXSD-4tFa7K-iRd7EU-2nGzd-bHLejM-Fp1Wj-6QEN5h-azsiHG

Table 3 (Cont.)

CaTIS image	Photographer	Year	Image name	Retrieved from
ТК	Dooby brain	2009	_	https://www.flickr.com/photos/doobybrain/475576450/in/photolist-J2siY-rnEYp- aYU1vP-cfgkWG-az1fqy-5GSMvL-orHbye-8iFFy2-7N9uTa-kySPZt-ceo4is-7NduEw- 4JyAdx-dd2xEo-4o3du-6wzXeK-5GSMwu-8wSLbJ-h3dZG-GXtnA-EH5EU-ebH7n3- orHiFR-dg6Ukw-9y4PSg-8eJLAC-fKjs8C-4VRFc8-vXks1-5Nwo32-8vURC8-9wm4aa- 4SpF18-83RrdQ-ffnoCf-7LsZ3W-gBedgJ-k6ouYk-7SpL3e-qU7FR8-6H8Rgr-8Y9G8G- bkciZW-8xoZKV-fxKwfN-akfa44-48Esnb-8oKoRL-4zx86D-9Mho3b
TM	Trung1145	2008	"To buon ngu qua"	https://www.flickr.com/photos/trunglq/2561055473/
ТО	Jean-louis Zimmerman	2008	"La ferme aux crocodiles"	https://www.flickr.com/photos/jeanlouis_zimmermann/3147318494/
TP	Beatrice	2009	"La ferme au crocodiles"	https://www.flickr.com/photos/28139909@N02/3255637517/in/photolist-5XFZBk- cPG1Yq-8UPRQy-6iGss8-8ijRY1-98VvzQ-axqPFV-2P6Uwo-6fjRd4-5N84Th-7i4Srg- mkk4i5-5N7yiu-6B55MM-6BaQtG-5DScDL-9BCCh6-9BEFSs-9BAWpg-9BDSwN- 8K6Ztj-aAfcE6-5M86qg-oY71Vi-94Wpt2-8i5X4E-rnXj7f-6fp3gf-diMPQN-6iKBE1- f8RR6E-6VYDJG-cjiAhh-5N85Tm-5N3qB8-5N7Fx1-5N7Ab9-5N7yZu-5N3i8n- 5N7i1S-puZe52-pteh3f-4JmFXS-21ZaiC-fd4Z7F-6hCH4E-kzmiQx-qX6tHR-394gop- brv4LK
TQ	Christian Haugen	2009	"Aussie crocodile"	https://www.flickr.com/photos/christianhaugen/3482116057/in/photolist-6iGKMK- 6BfqFx-rt2efu-6tMNkZ-5bt7Pw-44HTyW-doiqF1-a4obM5-iCXVn4-8MzGaR-7z2ioT- 4KdkfC-5N2Si6-5N2QKM-dL6reW-dySzUe-7aPSLU-6n5Sds-krKTXn-fLYmF3- qKAAnL-cjPByd-bp29Ub-a474A-oLyrGp-qHHDRe-7nFELb-d2qACJ-h43B8S-9cbpcf- 9cbkXd-9c8g5z-9c89Be-9cbdnu-6MGBBp-5N86QW-br3Dpd-de3Hkt-pdMhFN-6DSxi8- 5N3h8v-5HB5An-e69LD9-aj9RYx-5N39X4-8ToXzT-ewcCJN-kzkL86-5uTHC5- 5dDfNW
TR	Lwp Kommunikacio	2011	"Capak hete (2014)"	https://www.flickr.com/photos/lwpkommunikacio/14847522341/
TS	Smerikal	2012	"She has a message"	https://www.flickr.com/photos/smerikal/8330184193/

Table 3 (Cont.)

CaTIS image	Photographer	Year	Image name	Retrieved from
TE, TG– TJ, TL, TN, TT	Dan-Glauser, E. S focusing on valen	S., & Scherer nce and norm	r, K. R. (2011). The Gen ative significance. <i>Beha</i>	eva affective picture database (GAPED): A new 730-picture database vior Research Methods, 43, 468–477. doi: 10.3758/s13428-011-0064-1

Sources for Neutral (N) images

CaTIS	
image	Source
NA-NT	Dan-Glauser, E. S., & Scherer, K. R. (2011). The Geneva affective picture database (GAPED): a new 730-picture database
	focusing on valence and normative significance. Behavior Research Methods, 43, 468–477. doi: 10.3758/s13428-011-0064-1

Images are presented in the following pages in their categories, but in random order per category. We used Qualtrics to resize all images to have equal dimensions (640 x 480 or equivilant) all research presented in this thesis.

Threat-and-Crime Images

High-threat and high-crime









































Threat-Only Images

High-threat and low-crime









































Crime-Only Images

Low-threat and high-crime





































Neutral images

(from Dan-Glauser & Scherer, 2011)

Low-threat and low-crime









































Non-Validated Images

(see Paper 1 for further information)




Appendix Eleven: DSM-V Criteria and the Fear of Crime

Under the DSM-V, the criteria for specific phobias are:

A. Marked fear or anxiety about a specific object or situation...

B. The phobic object or situation almost always provokes immediate fear or anxiety;

C. The phobic object or situation is actively avoided or endured with intense fear or anxiety;

D. The fear or anxiety is out of proportion to the actual danger posed by the specific object or situation and to the sociocultural context;

E. The fear, anxiety, or avoidance is persistent, typically lasting 6 months or more;

F. The fear, anxiety, or avoidance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning; and G. The disturbance is not better explained by the symptoms of another mental disorder. (APA, 2013, p.197)

Although each person's clinical experiences are distinct, and it is not appropriate to provide global diagnoses, a cursory glance at these criteria may inspire curiosity around how fear of crime might fit. A person can experience marked fear or anxiety about a specific situation related to crime (although, the specificity of the situation would vary from person to person; Criterion A); and being exposed to this crime-related cue may provoke fear or anxiety (Criterion B) that is disproportionate (Criterion D) and results in avoidant behaviours (Criterion C) that persist (Criterion E) and distress (Criterion F). Under the DSM-IV, a client would also need to display insight into the fear being excessive or unreasonable, but this criterion was retracted for the DSM-V (Grohol, 2013). Clinicians could find diagnosis of specific phobia for fear of crime challenging due to Criterion A and the required specificity. For example, a person's diffuse fear of crime that is experienced much of the time may distress them (Criterion F) but avoiding walking after dark would fit Criterion A more cleanly due to the specificity of the situation. The sociocultural context is also worth considering (Criterion D). If we accept that fear of crime is common in our sociocultural context, then the associated fear and anxiety may be proportionate.

References

American Psychiatric Association. (2013), *Diagnostic and Statistical Manual of Mental Disorders*. (5th Edition). Washington D.C., USA: American Psychiatric Association. ISBN: 978–0–89042–554–1

Grohol, J. M. (2013). DSM-5 changes: Anxiety disorders and phobias. Newburyport, MA, USA: Psych Central Professional. Retrieved from https://pro.psychcentral.com/dsm-5-changes-anxiety-disorders-phobias/