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Revisiting sensitivity to risk in the fear of crime

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Title: Revisiting Risk Sensitivity in the Fear of Crime

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Running Head: Revisiting Risk Sensitivity in the Fear of Crime

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Revisiting Risk Sensitivity in the Fear of Crime

Abstract [word count: 117]

This paper considers the psychology of risk perception in worry about crime. A survey-based study replicates a long-standing finding that perceptions of the likelihood of criminal victimization predict levels of fear of crime. But perceived control and perceived consequence also play two roles: (a) each predicts perceived likelihood; and (b) each moderates the relationship between perceived likelihood and worry about crime. Public perceptions of control and consequence thus drive what Mark Warr defines as 'sensitivity to risk.' When individuals perceive crime to be especially serious in its personal impact, and when individuals perceive that they have little personal control over the victimization event occurring, a lower level of perceived likelihood is needed to stimulate worry about crime.

Key words: Fear of crime; risk perception; sensitivity to risk; personal vulnerability; probability insensitivity.

Beginning an often cited paper on a somewhat plaintive note, Warr & Stafford (1983) argued that one of the most disappointing features of research into the fear of crime was the lack of investigation into so-called 'proximate causes of fear' (meaning public perceptions of both the likelihood and consequence of criminal victimization). Complicating the ascription of *irrationality* when levels of fear outweigh levels of statistically estimated risk, Warr's (1987) 'sensitivity to risk' model predicts that the influence of perceived likelihood on fear is moderated by perceptions of crime seriousness. Warr found empirical support for the hypothesis that when people judged a crime to be especially serious, a lower level of perceived likelihood was needed to stimulate some level of personal fear. Individuals were more 'sensitive' to a given level of perceived likelihood when they viewed the crime to be especially serious in nature and consequence.

In a more recent study Chadee *et al.* (2007) considered some elements of the sensitivity to risk model. Yet rather than looking at the pivotal role of perceived seriousness of crime, the authors instead speculated on the utility of an extensive body of psychological research into judgments under uncertainty. When judging the likelihood of uncertain events, people often employ cognitive heuristics or 'rules of thumb' rather than follow principles of probability theory (Tversky & Kahneman, 1973).[i] One of these 'rules of thumb' – the availability heuristic – predicts that the size of a class tends to be judged by the ease with which instances of it can be retrieved from memory (Tversky & Kahneman, 1974). Applied to fear of crime, the availability heuristic may help explain why people tend to over-estimate the probability of criminal victimization, and particularly over-estimate the frequency of rare, spectacular and easily imaginable events (Warr, 1980). People substitute a relatively difficult question (how likely is it that I will become a victim of a particular crime?) with a relatively easy question (how easy can I imagine becoming a victim of a particular crime?).

The findings of a London-based survey extend Warr's model of risk sensitivity in two ways. First, when respondents judged crime to be especially uncontrollable, and when they judged crime to be especially serious in its consequence, a lower level of perceived likelihood was needed to stimulate relatively frequent worry about crime. Perceptions of consequence and control thus interacted with perceptions of likelihood to predict levels of worry about crime in the sample. Second, respondents tended to see victimization as likely when they saw the consequences to be severe and the event to be difficult to control. The availability heuristic predicts that vivid and easily accessible mental imagery (which in the current context may involve mental representations of highly uncontrollable, unpredictable and consequential crimes) shapes perceptions of the likelihood of a given risk. The extended model of risk sensitivity hopes to incorporate notions of vulnerability and circulating representations of risk into a more powerful framework on the dynamics of worry about crime.

FEAR OF CRIME AND THE PSYCHOLOGY OF RISK

The psychology of risk is an under-researched area in the fear of crime, yet insights can provide an important complement to the most extensive body of evidence: public perceptions of neighborhood breakdown and stability. Numerous studies have found that public concerns about local disorder, social cohesion and collective efficacy predict fear of crime (e.g. Ferraro, 1995; Perkins & Taylor, 1996; Jackson, 2004; and Wyant, 2008; for reviews see Hale, 1996; Farrall *et al.,* 2009). Such work suggests that citizens link the risk of crime with levels of moral consensus, social order and collective efficacy. If 'day-to-day' issues ('young people hanging around', 'poor community spirit', 'low levels of trust and cohesion') generate information about risk (Ferraro, 1995) and a sense of unease in one's environment (cf. Goffman, 1971; Warr, 1990; Tulloch, 2003), then fear of crime emerges as a social indicator of public concerns over neighborhood breakdown, societal cohesion, moral consensus, and the pace and direction of social change (Jackson, 2006). Citizens may be expressing through the language of 'fear' and 'crime' a wealth of anxieties about social fragmentation, the loss of moral authority, and the crumbling of interpersonal trust, daily civility and social capital (Girling *et al.*, 2000).

To this framework we might add the mechanisms that underpin subjective risk assessment. Consider Warr's (1987) 'sensitivity to risk' model. Simple yet powerful (Figure 1, left box), at its most basic the model describes the relationship between perceived risk (defined

by Warr as the perceived likelihood of victimization and measured by Warr on a scale from 0 to 10) and fear (measured by Warr via asking individuals how 'afraid' they are of falling victim on a scale from 0 to 10). Assuming a linear relationship between perceived risk and fear, a regression line captures the three basic elements: the point at which a given level of perceived risk stimulates a non-zero level of fear (*threshold*); the rate at which fear increases with perceived risk (*slope*); and the maximum level of fear that can be produced (*maximum fear*).

INSERT FIGURE 1 ABOUT HERE

According to the sensitivity to risk model the *threshold* and the *slope* (and therefore the maximum) can vary according to the type of crime and how serious individuals judge that crime to be (Warr, 1987). The threshold and slope can also vary according to social group. Study after study has shown that women tend to report higher levels than men of fear of falling victim of crimes such as physical attack or mugging (for general reviews of fear of crime literature, see Hale, 1996, and Farrall *et al.,* 2009). Warr (1985) found that women tended to see crimes as more serious than men partly because they tended to view certain crimes as a prelude to more serious crimes (so-called 'perceptually contemporaneous offenses,' since one event is judged to covary with another event). This, he argued, explained why the intercept in the regression equation was often higher (depending on the type of crime) for females than it was for males.

Warr (1987) subsequently found that both the threshold and the slope for the linear relationship between perceived likelihood and fear differed in a predictable way according to the average perceived seriousness of the crime in question. Figure 1 (right box) summarizes some of the data, where six regression lines model the linear relationship between fear and perceived likelihood for each of six criminal offences. As one moves from the bottom line to the top line so this offence was judged by respondents to be of an increasingly serious nature. In most cases the same level of perceived likelihood was unlikely to result in the same amount of fear, with Warr (1987) explaining this in part by differential perception of the seriousness of crime.[ii]

The risk sensitivity model thus suggests (a) that some crimes are typically seen as more serious than other crimes, (b) that different people can come to different conclusions about the same crime, and (c) that the interaction of individual levels of perceived seriousness and perceived likelihood in part generates the intensity of subsequent emotional response. Some individuals may associate a type of crime with especially serious consequences because they feel particularly vulnerable to the criminal event. They might, for example, associate burglary with violence in part because they lack the ability to defend themselves, and believe they could be a target of sexual assault in such a situation. But crucially, it is the subjective sense of seriousness and consequence that then leads to a subsequently heightened fear response, even when perceived probabilities are small, precisely because susceptibility and threat is believed to be high (cf. Jackson, 2009).

Yet the mass media might also play a role in risk sensitivity. The media are the prime source of information about the extent, nature and seriousness of crime in society. The most dramatic media reports are outliers: shocking but rare criminal events (cf. Stapel & Veltheuijser, 1996; van Zomeren & Lodewijkx, 2009). An individual might, for instance, associate burglary with violence in part because he or she receives striking reports of especially serious burglaries from the newspapers, television and other media. Circulating images of crime and risk may thus lead to widespread beliefs that the especially serious nature of crimes. If many people develop their own sense of risk shaped by common imagery of particularly frightening crimes, then it may not be very surprising that many people worry about crime. By hearing about specific events of crime that are brought home in a very vivid way – 'as if it could happen to me' – people may then develop these personalized representations of the risk of crime, with all the attendant sense of high consequence, loss of control, and sense of likelihood (Jackson, 2006).

Recall, however, that Warr (1985) found significant variation in perceptions of the seriousness of crime. Extending this to the impact of the mass media, people may selectively expose themselves to information (Freedman & Sears, 1965). Already fearful of crime – and

already feeling vulnerable – they actively seek out information. The resulting effect on public perceptions of risk may additionally depend on the nature and extent of local crime reports, with people paying particular attention to reports that are according to Koomen et al. (2000: 923): '…sensational and self-relevant presentations of crime that are local, random, and sensational.' Heath (1984: 264) argues that sensational crimes 'achieve their spine-chilling quality from either severe violations of social norms or from violations of deeply engrained social norms.' She found that reports of so-called 'sensational' crimes were associated with higher fear so long as the incidents were local (cf. Liska & Baccaglini, 1990), while crime reports that contained no information about the motive of the crime aroused more fear than if a motive was included. In Stapel & Velthuihsen's (1996) study stronger responses were also elicited when the victim was similar to the participant.

Extending the risk sensitivity model

The objective of this paper is, then, to uncover some of the basic dynamics of risk perception in worry about crime. It is for future research to explore the characteristics of sensational and self-relevant crime reports, to integrate an account of circulating representations of risk into the broader explanatory framework (cf. Jackson, 2008). The present task is more modest. Extending Warr's work on risk sensitivity in two directions, the first contribution is to examine dual interaction effects in which perceived control and perceived consequence each alter the observed relationship between perceived likelihood and worry about crime (Figure 2). When people judge crime to be especially serious in its personal effect, and when they feel they have little personal control over its occurrence, a lower level of perceived likelihood may be needed to predict a relatively frequent pattern of worry. Put another way, perceived likelihood becomes more important in the production of emotional response when personal consequence is seen to be especially high and when personal control is seen to be especially low.

INSERT FIGURE 2 ABOUT HERE

There are parallels here to the 'psychometric paradigm' in risk perception research (Slovic, 2000), which shows that people are attune not just to the likelihood of a risk and the number of lives at stake, but also to qualitatively distinctive factors including whether a risk is seen to be catastrophic or 'dreaded' and a risk is seen to be uncontrollable, familiar and involuntarily incurred. The current study captures two elements at the heart of the psychometric paradigm in risk perception research – perception of consequence and perception of control – but it specifies them within a model of cognitive and affective appraisals of the risk of criminal victimization. The first two hypotheses are, more precisely, that worry emerges when people view the risk of crime to be especially uncontrollable and especially consequential in its personal impact, in part because only a relatively low level of perceived likelihood is needed to stimulate emotional response.

The second contribution relates to the effect of perceived consequence on perceived likelihood and perceived control on perceived likelihood. Consistent with work on the availability heuristic, the third and fourth hypotheses are that viewing crime as highly consequential and highly uncontrollable will be associated with judging victimization to be especially likely. When people feel a relatively high level of control over risk, they may take adequate precautions, have good security provisions, feel able to 'read' the environment for signs of trouble, and be able to deal with any encounters if they were to occur. There is a good deal of evidence from psychological research that high perceived control is associated with low perceived likelihood in various domains of risk perception (e.g. Hoorens & Buunk, 1993). Yet, when people associate victimization with particularly dramatic and consequential events, and when people see specific criminal acts as especially uncontrollable and unpredictable, they may also find it easier to imagine themselves becoming a victim, since their mental imagery of crime involves emotionally-arresting characteristics and scenarios.

The rationale for the third and fourth hypotheses is as follows. Individuals who see victimization as difficult to control and especially strong in its impact are also expected to hold mental representations of risk that include dramatic and emotionally relevant imagery.

Nisbett and Ross (1980: 45) suggest that vividness is core to the availability of information, and that vivid information is typically: '(a) emotionally interesting, (b) concrete and imagery provoking, and (c) proximate in a sensory, temporal, or spatial way.' Thus, a starting premise of this study is that events which are seen to be highly serious and extremely difficult to control will be more likely to be cognitively represented using vivid and emotionally relevant imagery. Such imagery will then typically lead to heightened cognitive availability, it is assumed.

THE STUDY

Research objectives

Warr's model predicts that perceived likelihood of victimization will be more strongly associated with fear of victimization among those people who judge the seriousness of crime to be high (compared to those people who judge the serious of crime to be low). His work thus hinges on a statistical interaction in which perceived seriousness 'moderates' (i.e. increases or decreases) the strength of the relationship between perceived likelihood and worry about crime. This study tests four hypotheses by way of contribution:

H1 Perceived consequence will moderate the association between perceived likelihood and worry about crime;
H2 Perceived control will moderate the association between perceived likelihood and worry about crime;
H3 Perceived likelihood will be positively associated with perceived consequence; and,
H4 Perceived likelihood will be negatively associated with perceived control.

Participants

As with Warr's work, observational data are used to test the core propositions. Data were collected from a postal survey of residents of two neighbouring areas of London. A pure random probability sample of 1,800 registered voters was drawn from the UK Electoral Register. Respondents were sent a questionnaire, and if this was not returned within 2 weeks, a reminder letter (including duplicate questionnaire) followed. A raffle was also carried out (three prizes of £50, £25 and £10). The achieved response rate was 27% (479 completed questionnaires), with 33% in the first area (299 in Victoria Gardens) and 20% in the second (180 in Katherine House).[iii]

Victoria Gardens is a wealthy and well-kept suburb with predominantly white and middle-class residents.[iv] According to local police statistics, Victoria Gardens has low personal crime rates but a relatively high incidence of car crime. Katharine House is a high-rise, high-density, local authority housing estate with relatively high levels of personal crime and a significant amount of incivilities such as graffiti and young people causing noise and harassment. Katharine House is also an area with a good proportion of residents from low-income brackets and a diverse ethnic mix.

Yet the area in which respondents live is not considered important in this study, indeed the choice to survey these two neighborhoods was motivated by another research question. We know that perceptions of neighborhood breakdown and stability predict perceptions of risk (Ferraro, 1995; Farrall *et al.,* 2009). Where people live may be important in explaining people's perceptions of social cohesion and decline that then shape perceived risk, although people can come to quite different conclusions about the same environmental stimuli (Carvahlo & Lewis, 2003; Sampson & Raudenbush, 2004; Jackson, 2004; Franzini *et al.,* 2008). In the current study it may be that Katharine House contains a greater preponderance of social and physical cues. Observers in Katharine House may then relate the presence of disorderly cues to a significant risk of victimisation, and this might help explain overall area differences in worry about crime. But the target here in this study is the inter-relationships underpinning worry about crime and public perceptions of likelihood, control and consequence. Crucially, the psychological mechanisms linking cognitive appraisals of

risk to emotional responses are assumed not to differ systematically among individuals who live in the two neighbouring London areas.

Measures

To measure worry about crime, respondents were asked how often (if at all) they had worried about becoming a victim of each of seven crimes while in their neighborhood.[v] In order to get more accurate self-reports, the time-period in question was specified to be the past month (Jackson, 2005). The seven crimes were: being attacked by a stranger in the street; being robbed or mugged in the street; being harassed, threatened or verbally abused in the street; being pick-pocketed or having something stolen in a non-violent manner; having the home or property vandalised or defaced; having someone break into the home whilst the inhabitants were there; and having someone break into the home whilst the inhabitants were away. Response alternatives were: 'not once in the last month'; 'once or twice in the past month'; 'once or twice in the past week'; and 'every day.'

Perceived likelihood was measured by asking respondents how likely they thought it was that they would fall victim of each of the seven crimes in their area (over the next 12 months). Three measurement strategies are used to elicit such subjective probabilities. The first is to generate numeric expressions of probability or odds; one might, for example, ask respondents whether the pereived probability is 0.2 or 0.4 or 0.6, and so forth. The second is to use some kind of visual representation. One might for example provide a line labelled at the end points as 'probability of zero' and 'probability of one' and ask respondents to draw a cross between these two points that represents their own estimated probability.[vi] Generating verbal expressions of uncertainty is the third option, and the one taken in the present study with a seven-point scale labelled at the endpoints: 1 = *definitely not going to happen* and 7 = *certain to happen*.

On perceived consequence, respondents were asked how much they thought their lives would be affected by a typical instance of each of the categories of criminal victimization, with a seven-point scale labelled at the endpoints (1 = *not at all* and 7 = *to a very great extent*). Warr's (1987) study into risk sensitivity asked individuals how serious a given crime was. In making such a judgment it is conceivable that people draw on a number of issues including the impact on victims and society and the degree of moral culpability and transgression involved in the act (Warr, 1989; cf. Rosenmerkel, 2001, and Alter *et al.*, 2007).[vii] The current study measures perceptions of the seriousness of the personal impact of victimization (Jackson, 2009), which is assumed to invoke respondents' ability to cope with the consequences, but also respondents' expectations about the nature and severity of representative instances of various criminal acts.

Perceived control was measured by asking respondents whether they felt able to control whether they became a victim of various crimes in their area. A seven-point scale was used with only the endpoints labelled 1 = *not at all;* and 7 = *to a very great extent*. Perceived control over the risk of crime is assumed to comprise two things. The first is personal self-efficacy, i.e. feeling able to exert control over falling victim of crime, including being able to physically defend oneself and take appropriate precautions to keep safe. The second is public beliefs about the nature and characteristics of particular crime, e.g. whether a crime is seen to be especially unpredictable, involving indiscriminate targeting, being mobile, volatile, with obscure motivation.[viii]

Descriptive statistics

Tables 1 and 2 provide summary statistics for the single indicators of each of the four central constructs (worry about crime, perceived likelihood, perceived consequence and perceived control). Inspection of the top-line findings showed that the majority of the sample had not worried once in the past month, whether about property crime (burglary and vandalism) or personal crime (non-violent theft, physical attack by a stranger, harassment, and robbery). Somewhere between 4% and 13% of the sample reported having worried 'everyday' about falling victim of each crime. These are frequency levels consistent with British Crime Survey

estimates of the frequency of worry across England and Wales (Gray *et al.*, 2008; Farrall *et al.*, 2009).

INSERT TABLES 1 AND 2 ABOUT HERE

Table 2 shows mean levels of perceived likelihood over the next 12 months (ranging from 2.62 for physical attack to 3.31 for burglary while the inhabitants are not at home), where 1 = 'definitely not going to happen' and 7 = 'certain to happen.' All the variables had a positively skewed distribution, with longer right tails found in the more serious crimes of burglary while the inhabitants are at home, physical attack in the street by a stranger, and being robbed in the street. For the same crimes there was also positive kurtosis, indicating a more distinct peak near the mean, a more rapid decline, and larger tails compared to the other crime categories.

Turning to the perceived consequence measures, the mean ranged from 4.91 (non-violent theft) to 6.23 (burglary while the inhabitants are at home) on a scale ranging from 1 to 7 (where 1 = not at all and 7 = to a very great extent). All the items were negatively skewed, with the longer left tails being found in the variables relating to the more serious crimes (burglary while the inhabitants are at home, physical attack in the street by a stranger, and being robbed in the street). This suggests agreement among the respondents about the severity of impact of these crimes (backed up by the same three crimes having high and positive kurtosis statistics).

Finally, with the perceived control measures, the mean ranged from 3.15 (vandalism) to 4.68 (burglary while the inhabitants are at home) on a scale from 1 to 7 (where 1 = not at all and 7 = to a very great extent). There were relatively low levels of skewness in the distribution of each variable. All the kurtosis statistics were negative, suggesting a flat top near the mean rather than a sharp peak.

Statistical modelling

The first step of analysis was to examine the relationship between perceived likelihood and worry about crime, and particularly to test a moderating effect of perceived consequence (hypothesis 1) and of perceived control (hypothesis 2). All variables were weighted factor scores that were rescaled to range from 0 to 10.

INSERT TABLE 3 ABOUT HERE

Table 3 shows the results of three linear regression models, with the frequency of worry about personal crime specified in each model as the response variable. Perceived control and perceived likelihood both predicted levels of worry about personal crime, but perceived consequence did not (Model I). When adding the first interaction effect to the model (where the statistical effect of perceived likelihood on worry can differ according to levels of perceived consequence), the interaction term was found to be statistically significant. Supporting hypothesis 1, the estimated average statistical effect of perceived likelihood on worry increased as perceived consequence increased. Figure 3 provides a more accessible visualisation of the interaction effects relating to personal crime. Recall that the single indicators of perceived consequence were negatively skewed. The mean of the index was around 8 and the maximum was 10, and Figure 3 (top graphic) shows the fitted line (representing the estimated relationship between worry and perceived likelihood) where the perceived consequence index is 4, 6, 8 and 10. One can see that the slope of perceived likelihood increased as levels of perceived consequence increased. Among individuals who saw the personal consequences of victimization to be especially high, a lower level of perceived likelihood was needed to predict frequent worry about crime.

INSERT FIGURE 3 ABOUT HERE

A second interaction effect was then added between perceived likelihood and perceived control. Again this was statistically significant. As feelings of perceived control decreased, so the estimated average statistical effect of perceived likelihood on worry decreased. This supports hypothesis 2. Because the perceived control index had a normal distribution, fitted lines were provided for 0, 2, 4, 6, 8 and 10. Figure 3 (bottom graphic) shows that the slope of perceived likelihood increased as perceived control decreases.

Worry about property crime was also examined, although for reasons of brevity full findings are not presented. But to summarize: as with personal crime, the interaction effects were statistically significant, and the effect of perceived likelihood on worry increased as perceived control decreased and as perceived consequence increased.

To test the third and fourth hypotheses, structural equation modelling (using MPlus 5.2 and treating the indicators as ordinal-level variables) was used to estimate regression paths between the relevant latent variables; first for personal crime, and second for property crime (Figure 4). This technique has the advantage of allowing a number of regression equations to be simultaneously estimated, meaning that paths to worry can also be included in the statistical model. However, estimating interaction effects in structural equation modelling is a complex (and controversial) task, so interactions were not included here. Given that the standard regression techniques above established interaction effects (Table 4), the parameter estimates relating to likelihood predicting worry should be interpreted as only the average effect of likelihood across all levels of (separately) perceived control and perceived consequence.

INSERT FIGURE 4 ABOUT HERE

Starting with personal crime, the fit of the model was good according to approximate fit indices (RMSEA=0.08, CFI=0.97, TLI=0.99) and not good according to exact fit statistics (χ^2=173, 42 df, ρ<.001), although it is customary to focus on approximate fit indices (Hu & Bentler, 1999). Because no structural paths were constrained, the fit statistics relate to the test of the measurement models. This indicates that the scales have adequate reliability, and that the structure of the measurement model had some validity. This conclusion is strengthened by the fact that the factor loadings (validity coefficients) of the worry indicators were all statistically significant and of considerable magnitude (pick-pocket, λ=0.78; physical attack, λ=0.90; harassment, λ=0.86; and street robbery, λ=0.93), as were the factor loadings of the perceived likelihood indicators (pick-pocket, λ=0.77; physical attack, λ=0.92; harassment, λ=0.85; and street robbery, λ=0.89), the perceived consequence indicators (pick-pocket, λ=0.79; physical attack, λ=0.89; harassment, λ=0.84; and street robbery, λ=0.86) and the perceived control indicators (pick-pocket, λ=0.75; physical attack, λ=0.91; harassment, λ=0.85; and street robbery, λ=0.91).

All the coefficients relating to structural paths were statistically significant, apart from the path of perceived consequence to worry about personal crime. Replicating the results from Model I (Table 3), perceived likelihood was a strong predictor of worry and perceived control was a moderate predictor of worry. Higher expected values of worry were associated with judging likelihood of victimization to be high and personal control over the risk to be low. Moreover, both perceived control and perceived consequence were moderate predictors of perceived likelihood. The more an individual saw the consequence to be severe and the more an individual saw control to be low, the higher the expected value of perceived likelihood.

For property crime, the fit of the model was good according to approximate fit indices (RMSEA=0.09, CFI=0.96, TLI=0.96) but not good in terms of exact fit (χ^2=117, 25 df, ρ<.001). In fact a respectable fit was only achieved by allowing error terms to covary between each pair of the ‘burglary in’ and ‘burglary out’ indicators. This is justified by respect to measurement error, since respondents can plausibly have different expectations about burglary. As with personal crime, the factor loadings of the various indicators were also all statistically significant and of considerable magnitude. All the coefficients relating to structural paths were statistically significant, apart from the one relating to the path between

perceived consequence and worry about property crime. As with personal crime, perceived likelihood was a strong predictor and perceived control was a moderate predictor of worry about property crime. Again, higher expected values of worry were associated with judging likelihood of victimization to be high and personal control over the risk to be low. Finally, both perceived control and perceived consequence were moderate predictors of perceived likelihood: the more an individual saw the consequence to be severe, and the more an individual saw the control to be low, the higher the expected value of perceived likelihood.

DISCUSSION

The findings of this study contribute to our understanding of the psychology of risk in worry about crime. The utility of differentiating between perceived likelihood, consequence and control is demonstrated. While perceived likelihood was the judgment that most strongly predicted levels of worry about crime, perceived control and perceived consequence each had three roles to play. First, each predicted perceived likelihood. Second, each predicted worry (with the exception of perceived consequence). Third, each moderated the strength of the association between perceived likelihood and the frequency of worry. Warr (1987) found that among people who judged crime to be especially serious, a lower level of perceived likelihood was needed to stimulate a given level of personal fear. He argued that such individuals were thus more 'sensitive' to a given level of perceived likelihood:

> '…the perceived seriousness of an offense affects fear by altering the functional relation between fear and perceived risk (i.e., sensitivity to risk). Sensitivity to risk in turn affects fear by determining the "output" of fear produced by a given "input" of perceived risk.' (Warr, 1987: 40).

The current investigation extends this finding. The greater the perceived consequence and the lower the perceived control, the stronger the observed association between perceived likelihood and worry about crime. People worried even when they viewed victimization to be relatively unlikely, so long as they saw the personal impact of the event to be high and/or their personal control to be low.

To explain why perceived control and perceived consequence might be associated with perceived likelihood, we can draw on research from cognitive psychology into why people routinely over-estimate the probability of dramatic and salient events. There is a good deal of evidence from the psychological literature that high perceived control predicts low perceived likelihood (see Skinner, 1996, for a review of the concept of perceived control). But the availability heuristic states that people judge the probability of an event partly on the ease with which they can imagine the event. Applied to worry about crime, cognitive representations of vivid and dramatic crimes may be characterised in specific mental models of risk as especially uncontrollable events with highly serious consequences. Crucially, respondents in the study may have judged the likelihood to be relatively high partly because they found it relatively easy to personally imagine criminal acts and criminal events. Individuals might be substituting a difficult question (how likely is it …?) with an easy question (can I picture the event …?).

CONCLUSIONS AND FUTURE DIRECTIONS FOR RESEARCH

This paper hopes to stimulate a program of psychological research into perception and the fear of crime. Citizens generate their own subjective risk estimates, which comprise the interplay between perceived consequence, likelihood and control. Combined with the fact that the media routinely report rare but sensational criminal events, this may explain why many people worry about crime and, indeed, why some individuals worry more than other individuals (through selective information seeking and prior feelings of personal vulnerability). Threats that seem difficult to detect, that involve indiscriminate targeting, that are mobile, volatile and with obscure motivation – all these may be especially worry or fear provoking, in part because of two processes. The first is cognitive availability, since vivid social representations of crime may elevate the perceived likelihood of that event occurring. The second is through perceptions of

powerlessness and severe consequence interacting with perceived likelihood to stimulate relatively frequent emotional response.

There are parallels here to 'probability neglect' in risk perception research (Sunstein, 2003; Loewenstein *et al.,* 2001; Rottenstreich & Hsee, 2001). Probability neglect predicts that when strong emotions are involved, people focus on the badness of the outcome rather than on the probability that the outcome will occur. Sunstein (2003) argues that probability neglect helps explain excessive public reactions to low-probability risks of catastrophe such as terrorist attacks. People who are already fearful of terrorism will focus less on the sense of probability and more on the actual event. Vivid imagery of the event crowds out a more dispassionate sense of statistical chance. And while one may ask why someone is fearful in the first place, probability neglect does suggest a simple mechanism by which fear is maintained.

On first glance the two notions – of risk sensitivity and probability neglect – diverge. We are 'sensitive' to perceived likelihood but we are also 'neglectful' of perceived likelihood. Yet in this observational study the empirical implications of the two models are actually identical. It is just that the two underlying psychological processes are different. In both cases people with high levels of emotion could view the likelihood to be relatively low when the consequence is seen to be high. On the one hand, probability neglect states that this is because emotion crowds out rational assessments of likelihood, so perceived consequence takes over. On the other hand, risk sensitivity suggests that once individuals associate a risk with high personal consequence and low personal control, only a relatively small level of perceived likelihood is needed to elicit a strong emotional response.

The real issue here is what would happen to individuals for whom the perceived likelihood of victimization increases over time. Would (for example) the manipulation of perceived likelihood lead to large shifts in emotion, as predicted by the risk sensitivity model? Or would heightened perceived likelihood lead to weak shifts in emotion, as predicted by the probability neglect model? Observational data cannot be the arbiter here; experimental studies exert greater control and power to infer. If we are to integrate into existing explanations some core aspects of the psychology of risk, future experimental work is best placed to answer questions such as these, to help uncover some of the dynamics and mechanisms underpinning this important social and political phenomenon of our day.

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TABLES

TABLE 1 Descriptive statistics of the sample

	Not once in the past month	Once or twice in the past month	Once or twice in the past week	Everyday	Row %
Burglary (out of the home)	211 (46%)	163 (35%)	28 (6%)	60 (13%)	100%
Burglary (in the home)	336 (72%)	85 (18%)	25 (5%)	19 (4%)	100%
Vandalism etc.	261 (57%)	113 (25%)	40 (9%)	46 (10%)	100%
Non-violent theft	323 (70%)	96 (21%)	21 (5%)	23 (5%)	100%
Physical attack	346 (75%)	69 (15%)	25 (5%)	24 (5%)	100%
Harassment	320 (69%)	85 (18%)|	28 (6%)	29 (6%)	100%
Robbery	323 (70%)	96 (21%)	19 (4%)	24 (5%)	100%

TABLE 2 Descriptive statistics of the sample

Variables	M	SD	Skewness	Kurtosis
How likely do you think it is that you will fall victim of each of the following during the next twelve months? 1 = *definitely not going to happen* and 7 = *certain to happen*.				
Burglary while out of the home	3.31	1.46	0.40	-0.45
Burglary while in the home	2.48	1.34	1.13	1.08
Acts of vandalism / graffiti / damage to property	3.25	1.57	0.66	-0.31
Being pick-pocketed and other non-violent theft	2.77	1.36	0.94	0.69
Being physically attacked in the street by a stranger	2.62	1.32	1.11	1.01
Being harassed, being threatened or verbally abused in the street	3.08	1.64	0.84	-0.19
Being mugged and robbed	2.76	1.40	1.00	0.71
To what extent do you think the experience of a typical instance of each of the following would affect your everyday life? 1 = *not at all* and 7 = *to a very great extent*.				
Burglary while out of the home	5.49	1.58	-1.12	0.53
Burglary while in the home	6.23	1.38	-2.16	4.24
Acts of vandalism / graffiti / damage to property	5.17	1.55	-0.47	-0.56
Being pick-pocketed and other non-violent theft	4.91	1.60	-0.51	-0.51
Being physically attacked in the street by a stranger	6.19	1.32	-2.03	3.96
Being harassed, being threatened or verbally abused in the street	5.32	1.54	-0.91	0.23
Being mugged and robbed	6.08	1.33	-1.88	3.57
To what extent do you feel able to control whether or not you become of victim of the following? 1 = *not at all;* and 7 = *to a very great extent*.				
Burglary while out of the home	3.95	1.93	-0.06	-1.20
Burglary while in the home	4.68	1.91	-0.48	-0.95
Acts of vandalism / graffiti / damage to property	3.15	1.86	0.47	-0.97
Being pick-pocketed and other non-violent theft	4.08	1.86	-0.16	-1.06
Being physically attacked in the street by a stranger	3.57	1.86	0.20	-1.08
Being harassed, being threatened or verbally abused in the street	3.45	1.79	0.28	-0.95
Being mugged and robbed	3.61	1.81	0.17	-1.02

TABLE 3 Risk sensitivity: Worry about personal crime and the perception of risk

Variable	Model					
	(I)		(II)		(III)	
	B	**CI**	***B***	**CI**	***B***	**CI**
Perceived likelihood (high values = high likelihood)	0.53***	0.43, 0.63	-0.27	-0.72, 0.19	0.76***	0.61, 0.90
Perceived control (high values = high levels of control)	-0.16***	-0.23, -0.08	-0.15***	-0.22, -0.08	0.01	-0.10, 0.11
Perceived consequence (high values = serious imagined consequences)	0.07	-0.03, 0.17	0.09	-0.23, 0.04	0.07	-0.02, 0.17
Interaction between perceived likelihood and perceived consequence			0.09***	0.04, 0.14		
Interaction between perceived likelihood and perceived control					-0.06***	-0.08, -0.03
(Constant)	0.13		1.48		-0.61	
R^2	0.31		0.33		0.34	

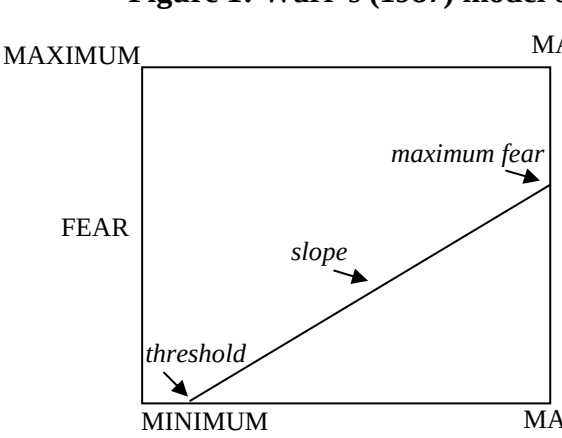
* statistically significant at the 5% level, ** statistically significant at the 1% level, *** statistically significant at the 0.1% level

B = estimated partial regression coefficient; CI = 95% confidence interval

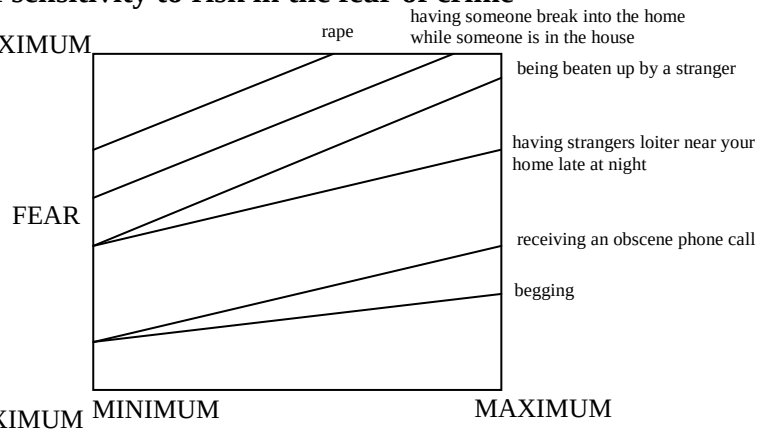
All variables are weighted factor scores rescaled from 0 to 10.

FIGURES

Figure 1: Warr's (1987) model of sensitivity to risk in the fear of crime



Basic elements of Warr's (1987: 31) sensitivity to risk model



Adapted from Warr (1987: 38)

NB. Each line represents the relationship between perceived risk and fear for one of eight different offence types. Working upwards from begging to rape, each crime was judged to be more serious than the previous crime by respondents in the study.

Figure 2: Psychology of risk in worry about crime

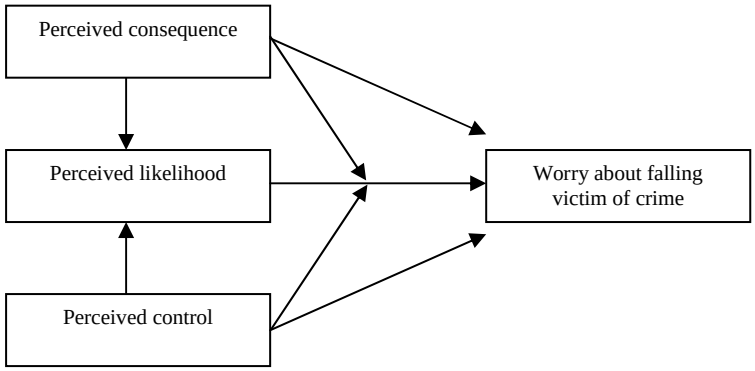
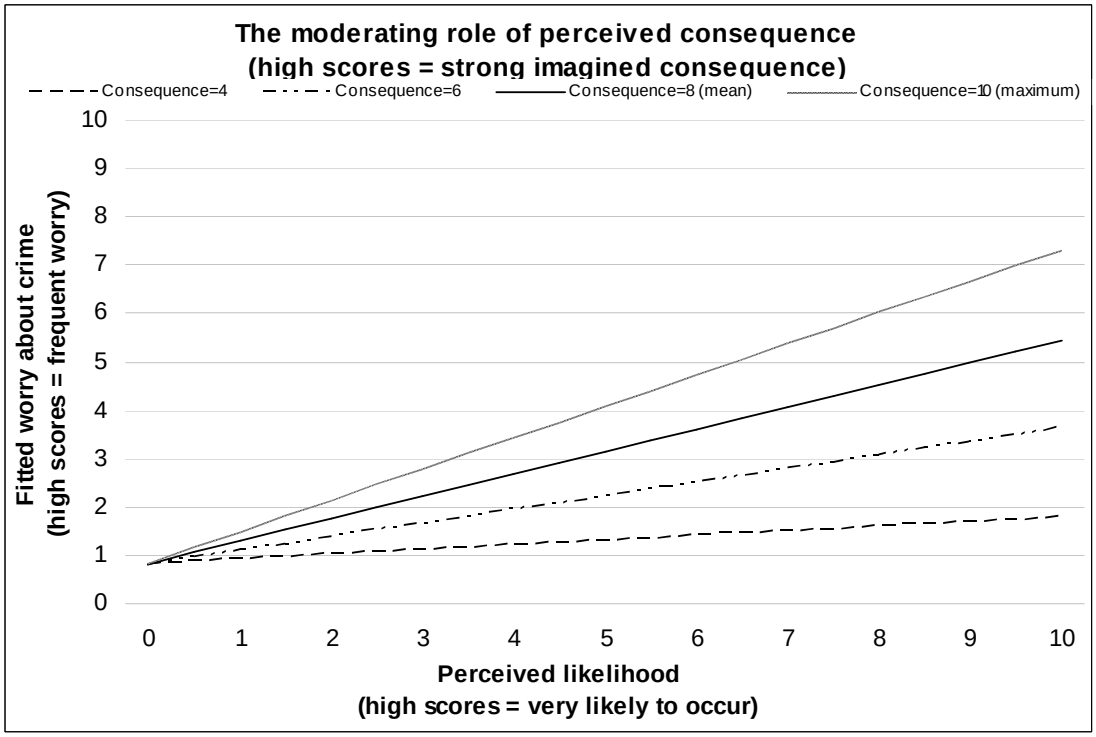
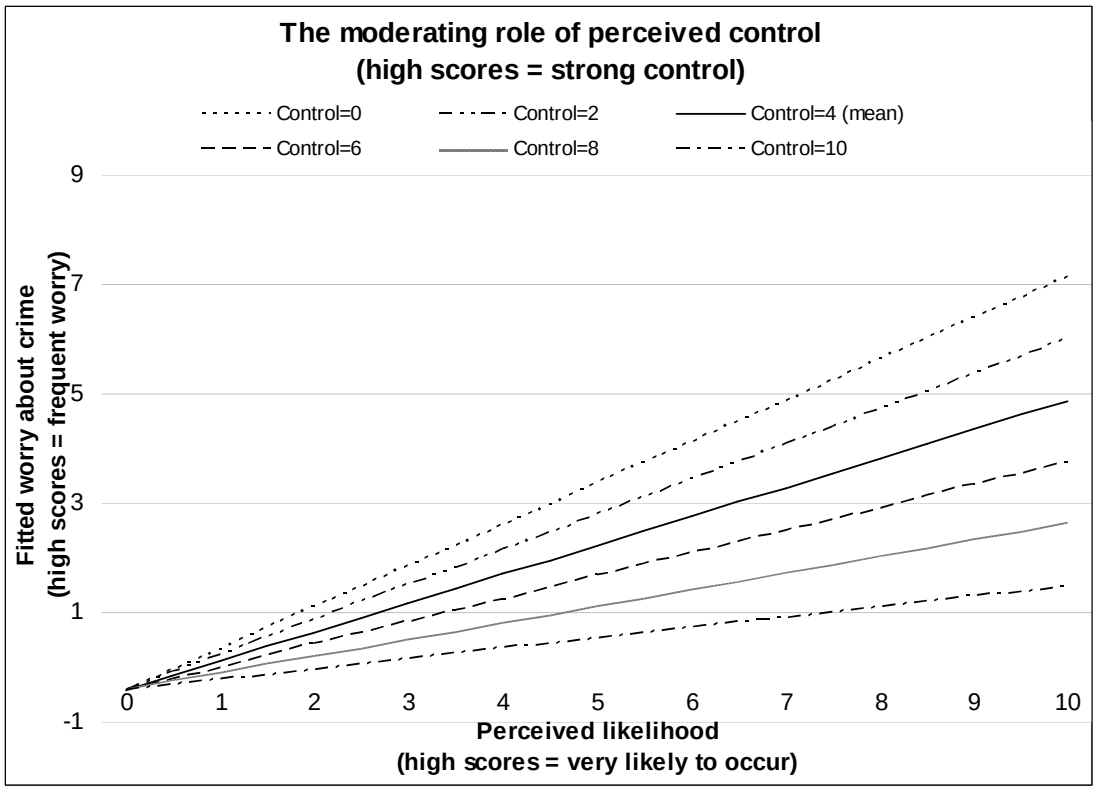


Figure 3: Sensitivity to risk in worry about personal crime

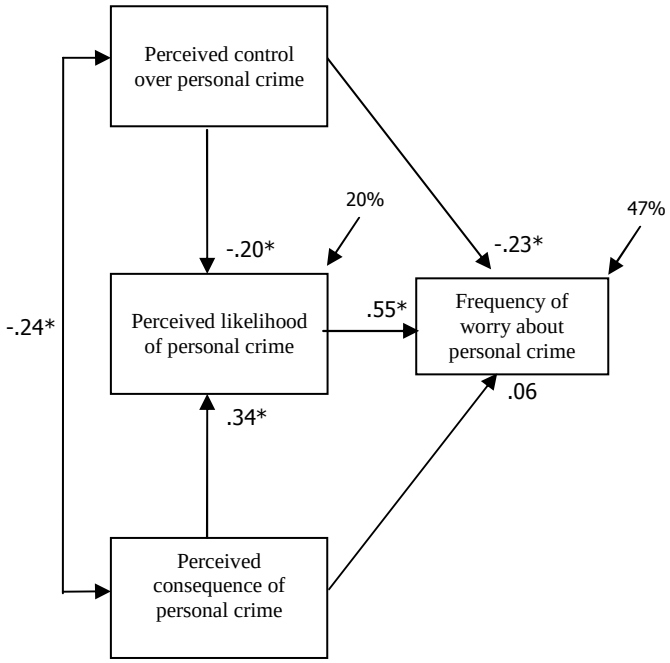




NB: the perceived consequence variable is skewed, with a mean of around 8, a maximum of 10, and a long tail towards 0 (less than 5% of the sample had a score of below 4).

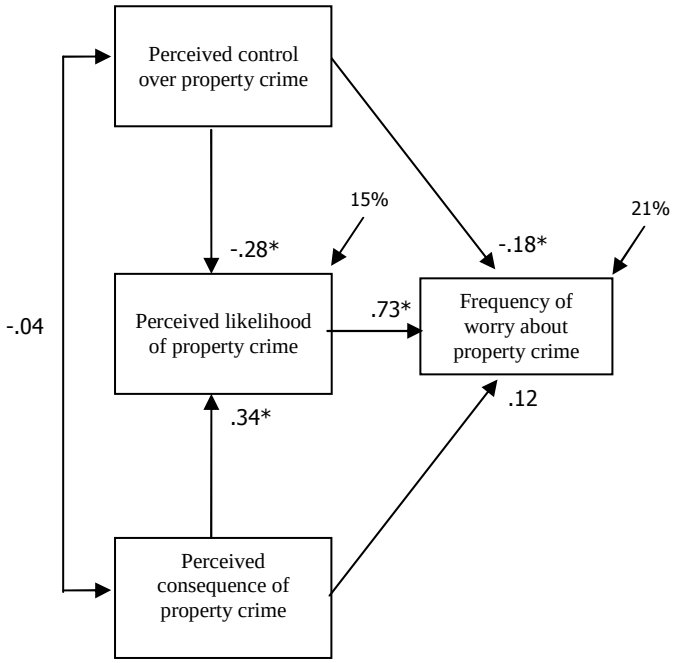
Figure 4: Risk perception, the availability heuristic and worry about crime

Personal crime



Structural equation modelling with categorical factor indicators (MPlus 5.2)
Measurement models not shown
Standardized coefficients
Chi-square=173, 42 df; ρ <.001
RMSEA=0.08; CFI=0.97; TLI=0.99
* significant, p<.05

Property crime



Structural equation modelling with categorical factor indicators (MPlus 5.2)
Measurement models not shown
Standardized coefficients
Chi-square=117, 25 df; ρ <.001
RMSEA=0.09; CFI=0.96; TLI=0.96
* significant, p<.05

[i] According to Tversky & Kahneman (1973), cognitive heuristics are 'highly economical and usually effective,' but they can also 'lead to systematic and predictable errors.' For discussion see Gigerenzer (2000).

[ii] More recent research has shown that judgments of seriousness are composed of evaluations of the harmfulness of a crime and the wrongfulness of a crime (Warr, 1989; O'Connell & Whelan, 1996; Rosenmerkel, 2001; Alter *et al.*, 2007). Warr (1989) found that people tend to focus on one or the other evaluation, attending to the dominant feature of the crime. When crimes were seen as especially harmful, then the judgment of seriousness was heavily weighted by harmfulness. But when crimes were seen as especially wrong, then the judgment of seriousness was heavily weighted by wrongfulness. In a later study Alter *et al.* (2007) found that wrongfulness was dominant, however, although harmfulness was still a factor.

[iii] The samples cannot be viewed as representative of the two areas. Yet one typically worries about the representativeness of a sample when one estimates more basic population attributes such as means or proportions. Relationships between constructs are arguably less susceptible to low response rates, and the relationships between threat appraisal, vulnerability and emotion (for example) are unlikely to be specific to whether one lives in one adjacent area of London or another.

[iv] Victoria Gardens and Katherine House are pseudonyms.

[v] These measures are assumed to produce a more accurate reflection of the everyday experience of fear of crime than standard measures such as 'How safe do you feel walking alone in your area after dark?' and 'How afraid are you of being burgled?'. Warr (2000: 434) differentiates between those fears 'aroused by an immediate danger, as when an individual is confronted by an armed attacker or is verbally threatened with harm' and those anxieties about future or past events that result from an 'anticipation of possible threats or in reaction to environmental cues (e.g. darkness, graffiti) that imply danger.' He suggests that standards measures of 'fear' capture anxiety rather than fear. Other researchers have employed to good effect measures of the past *frequency* of worry about crime (Jackson, 2004, 2005; Gray *et al.*, 2008; Farrall *et al.*, 2009). The current study takes this lead, by focusing on past events of everyday worry, in order to more precisely measure specific previous instances of worry.

[vi] Which is the best option for measuring the perceived likelihood of criminal victimization? Windschilt and Wells (1996) suggest that questions that use words or numbers to describe uncertainty encourage respondents to use one or two separate systems of reason: one based on associative, intuitive and automatic processes; the other on rule-based, deliberate, controlled processes (cf. Sloman, 1996). One should therefore use words to describe probability when one assumes that individuals think about the given risk in one way, and use numbers to describe probability when one assumes that individuals think about the given risk in another way. The question for the current investigation is whether the risk of victimization is most often thought about using intuitive and non-rule based reasoning (if this is the case, then measures that employ verbal expressions of uncertainty are to be preferred) or in terms of actuarial and systematic terms (if this is the case, then measures that employ numeric expressions of uncertainty are to be preferred). Verbal expressions were chosen in this study because it is assumed that people think about the chances of victimization using intuitive and non-rule based reasoning, rather than numeric, formal and rule-based information processing.

[vii] Warr (1989) found that where crimes are perceived be more wrong than harmful, then worry wrongfulness dominates the seriousness judgment, and vice versa: where crimes are perceived to be more harmful than wrong, then harmfulness dominates the seriousness judgment.

[viii] It is for future study to investigate the extent to which perceived control consists of perceived self-efficacy and specific beliefs/representations of criminal acts.