CRIMINOLOGY

TOWARD A BIFURCATED THEORY OF EMOTIONAL DETERRENCE*

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Since Hobbes (1957 [1651] and Beccaria (1963 [1764]), scholars have theorized that the emotion of fear is critical for deterrence. Nevertheless, contemporary deterrence researchers have mostly overlooked the distinction between perceived sanction risk and fear of apprehension. Whereas perceived risk is a cognitive judgment, fear involves visceral feelings of anxiety or dread. Equally important, a theory explicating the influence of deterrence on both criminal propensity and situational offending has remained elusive. We develop a theoretical model in which perceived risk and fear are distinguished at both the general and situational levels. We test this theoretical model with data from a set of survey-based experiments conducted in 2016 with a nationwide sample of adults (N = 965). We find that perceived risk and fear are empirically distinct and that perceived risk is positively related to fear at both the general and situational levels. Certain background and situational factors have indirect effects through perceived risk on fear. In turn, perceived risk has indirect effects through fear on both criminal propensity and situational intentions to offend. Fear's inclusion increases explanatory power for both criminal propensity and situational offending intentions. Fear is a stronger predictor than either self-control or prior offending of situational intentions to offend.

Of all passions, that which inclineth men least to break the laws, is fear. Nay, excepting some generous natures, it is the only thing, when there is appearance of profit or pleasure by breaking the laws, that makes men keep them.

—Thomas Hobbes (1957 [1651]: 195).

Founded on the Enlightenment philosophies of Beccaria (1963 [1764]) and Bentham (1988 [1789]), the deterrence tradition developed as an economic approach to explaining crime causation (Cook, 1980). Deterrence researchers quantified various properties of

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sanctioning regimes—the probability (certainty), speed (celerity), and amount (severity) of formal punishment—as likely predictors of criminal offending (Becker, 1968; Gibbs, 1975). Beginning with Waldo and Chiricos (1972), attention increasingly turned to the *subjective* properties of sanction regimes (Nagin, 1998; Paternoster, 1987). In subsequent studies, researchers assessed people's cognitive judgments about the probability, speed, and amount of punishment (Lochner, 2007; Loughran et al., 2016; Matsueda, Kreager, and Huizinga, 2006). They found a modest deterrent effect of the perceived probability but not the speed or amount of formal punishment (Apel, 2013; Pickett and Roche, 2016; Pratt et al., 2006). As Paternoster (2010: 819) observed, "A puzzling question is why deterrent effects reported in the literature are not stronger." Others have concluded that because "the body of evidence pointing to deterrence theory's weak effects is large and consistent," there is warrant to "simply declare it to be a weak explanation of criminal behavior and leave it at that" (Pratt and Turanovic, 2016: 17).

One possibility is that the strength of deterrence theory has been underestimated in the empirical literature because researchers have overlooked *fear*. Fear is "an inhibitory emotion" that should strongly impede criminogenic tendencies (Topalli and Wright, 2014: 52). For centuries, scholars have emphasized that the emotion (or passion) of fear is essential for deterrence (Beccaria, 1963 [1764]; Hobbes, 1957 [1651]). Gibbs (1975) defined deterrence as crime control through the inoculation of fear and posited that perceived sanction risk is a cause of fear. Cusson (1993: 55) asserted that "fear is obviously at the heart of deterrence" but explained that it "is not a calculated risk." Whereas perceived risk is a cognitive judgment, fear entails feelings of anxiety or dread (Farrall, Jackson, and Gray, 2009; Warr, 2000).

The fear elicited by the thought of apprehension should be a powerful and most proximate deterrence variable influencing criminal decision-making. As Camerer, Loewenstein, and Prelec (2005: 484) explained, "cognition by itself cannot produce action; to influence behavior, the cognitive system must operate via the affective system." Therefore, although the dominant view is that "deterrence is essentially a perceptual phenomenon" (Raaijmakers et al., 2017: 6), deterrence ultimately may be emotional (Jacobs and Cherbonneau, 2017). At the same time, it is improbable that a given level of perceived sanction risk will inspire the same amount of fear in all people in all situations (Cusson, 1993; Jacobs, 2010). Instead, individuals are likely to differ in the tendency to feel anxiety about apprehension, net of sanction perceptions (Loewenstein et al., 2001). Individual differences in affective responsiveness to sanction risk may help to explain variation in deterrability (or risk sensitivity), which has been undertheorized and rarely analyzed in deterrence scholarship (Jacobs, 2010; Jacobs and Cherbonneau, 2017).

In this study, we develop a bifurcated theoretical model of deterrence, which distinguishes perceived sanction risk from fear of apprehension at both the general and situational levels, and elaborates the role of fear in two important stages of criminal decision-making: 1) general openness to crime and 2) the weighing of specific criminal opportunities. To do so, we integrate insights from three areas of scholarship: 1) fear of crime (Ferraro, 1995; Jackson, 2011; Warr, 1987), 2) the role of emotions in criminal decision-making (van Gelder and de Vries, 2012, 2014; van Gelder et al., 2017), and 3) the relationship between generalized criminal propensity and situational offending (Cullen and Pratt, 2016; Piquero and Tibbetts, 1996; Piquero et al., 2011). We argue that because prior perceptual deterrence studies have not accounted for the role played by fear of

apprehension, the current understanding of crime decisions is incomplete.[1] The results from an experiment conducted with a large nationwide sample of Americans ($N = 965$) support our theoretical expectations.

FEAR VERSUS RISK, EMOTION VERSUS COGNITION

Findings from neuropsychological studies reveal that fear is neither an inevitable nor an invariable response to risk, and individuals differ substantially in their susceptibility to fearfulness (Loewenstein et al., 2001; Raine, 2013). These insights have important implications for deterrence. Although there is a wealth of evidence about perceptions of sanction risk (Anwar and Loughran, 2011; Lochner, 2007; Pickett and Bushway, 2015; Thomas, Loughran, and Piquero, 2013), previous research has not explored *fear* of apprehension. Deterrence researchers have touched on the theoretical importance of fear or worry—noting, for example, that "the key question is to what extent compliance with the law is influenced by *fear* of punishment?" (Wikström, Tseloni, and Karlis, 2011: 403, emphasis added). Unfortunately, analyses have been limited to *cognitive* measures of sanction risk (e.g., "how great a risk [do] you think there is of being caught") (Wikström, Tseloni, and Karlis, 2011: 408). In a few studies, the deterrent effects of general negative state affect have been investigated but not fear of apprehension (van Gelder and de Vries, 2012, 2014); these studies are discussed in the next section.

Given the dearth of research on fear of apprehension, we turn to the rich literature on fear of crime for insights on the measurement of fear, its relation to cognitive judgments about risk, and its influence on behavior (Farrall, Jackson, and Gray, 2009; Hale, 1996; Warr, 2009). Before proceeding, we should clarify why research on *fear of crime* is useful for understanding *fear of apprehension* in criminal decision-making. As Warr (2000: 454) explained, "there is no evidence that fear of crime is qualitatively different from other forms of fear. What differentiates one from another is merely the object or stimulus of fear."

The earliest research on fear of crime suffered from "theoretical casualness and empirical chaos" (Hale, 1996: 94). Most notably, there was "a failure to recognize elementary distinctions between perception, cognition, and emotion" (Warr, 2000: 453). This characterization also applies to the deterrence literature, where researchers who have used cognitive measures of sanction risk have sometimes concluded that their findings illuminate how individuals respond when "they fear the consequences" of getting caught (Wikström, Tseloni, and Karlis, 2011: 417). In contrast, fear is an *emotional* "reaction to the perceived environment" (Warr, 2000: 453), and thus, it is theoretically distinct from *cognitive* judgments, like perceptions of likelihood or severity of consequences (Ferraro, 1995; Ferraro and LaGrange, 1987).

In developing our theoretical model, we focused on the relationship between perceived certainty and fear of apprehension. Researchers have found a deterrent effect of

1. Deterrence researchers have investigated the effect of exogenous emotional shocks on criminal decision-making, with mixed results (Kamerdze et al., 2014; Loewenstein, Nagin, and Paternoster, 1997). Such *incidental* affect—that is, feelings triggered by something other than the target object—is theoretically and empirically distinct from fear of apprehension, which is *integral* affect, or feelings that are intrinsically linked to the specific target object (i.e., criminal sanctions; Blanchette and Richards, 2010).

perceived certainty (or likelihood) of apprehension, but not of perceived celerity or severity of punishment (Loughran et al., 2016; Pratt et al., 2006). Indeed, the consistency of this finding has led scholars to label it the "certainty principle" (Apel, 2013). Nevertheless, it is impossible to divorce certainty from severity completely because the certainty of apprehension is only relevant for deterrence if being arrested has negative consequences. In the same way, fear of apprehension encompasses anxieties about any attendant consequences *of being arrested* (but not of involvement in crime itself). These anxieties include (but are not limited to) worries about arrest stigma and reputational damage, attachment costs, commitment costs, and direct sanction costs (see Williams and Hawkins, 1986: 562–6). This fear is separate from cognitive judgments about the magnitude or severity of these negative outcomes. Additionally, fear of apprehension is different from anxieties about being harmed during or after the offense either by the victim, bystanders, or other offenders. Whereas fear of apprehension should be influenced by cognitive judgments about arrest risk, anxieties about offending-related *victimization* should result primarily from cognitive judgments about the dangerousness of offending (see McCarthy and Hagan, 2005).[2]

Although there should be a positive correlation between perceived certainty and fear of apprehension (Warr, 2000), the constructs are not the same. To illustrate, in the case of fear of crime, some individuals perceive that the risk of falling victim to a crime is low, and yet they still are very afraid of being victimized, and vice versa (Jackson, 2011).[3] Anderson (1999: 135–6) explained that inner-city youth often become "inured to violence." They perceive that violent victimization is very likely, but they are unafraid of it—"dying 'ain't no big deal'" to them. In the same way, we posit that some individuals who perceive a high likelihood of apprehension for committing a crime may nonetheless be unafraid of getting caught. They may be accustomed to arrest or simply have nothing to lose (Harris, Duncan, and Boisjoly, 2002). For instance, past arrests may render ensuing arrests more familiar and less frightening; alternatively, in some areas, arrest may be a common and accepted life event (see Clear, 2007; Western, 2006). Neutralization or social learning, especially through interactions with accomplices, may also reduce fear, independent of perceived risk (Jacobs, 2010; Jacobs and Copes, 2015). Indeed, "nerve management"—intentional efforts to reduce fearfulness in the face of risk (e.g., developing a "fuck it" mentality)—appears to be an important agentic response for persistent offending (Jacobs and Cherbonneau, 2017). Fear of apprehension is thus theoretically distinct from perceptions of sanction risk (Cusson, 1993).

Several findings from empirical scholarship on fear of crime are especially instructive about the potential role of fear of apprehension in crime deterrence. First, extant evidence shows that fear of crime is *empirically* distinct from both the perceived likelihood and severity of victimization (Ferraro, 1995; Rountree and Land, 1996; Warr and Stafford, 1983). Second, researchers have found that "perceived risk is a proximate cause of fear" (Warr, 2000: 454). According to Ferraro (1995: 60), "perceived risk is the most important determinant of fear of victimization, whether that is fear of property or personal crime, or all crimes considered jointly." Third, many factors, including characteristics of the local

2. Perceptions of whether a behavior is dangerous or safe (e.g., "how safe would you feel . . . ") are cognitive judgments, not emotional reactions (Ferraro, 1995: 24).

3. Disjunctions between cognitive and affective reactions to risk are not limited to the case of criminal victimization (Camerer, Loewenstein, and Prelec, 2005).

environment, prior victimization, and media consumption have indirect effects on fear of crime through perceived victimization risk (Chiricos, Hogan, and Gertz, 1997; Farrall, Jackson, and Gray, 2009; Ferraro, 1995; LaGrange, Ferraro, and Supancic, 1992).

Fear of crime has a profound effect on many different forms of behavior (Warr, 2009). These behaviors include 1) defensive behaviors, such as acquiring a firearm (Hauser and Kleck, 2013) or moving to a gated community (Lemanski, 2006), as well as 2) constrained behaviors, such as avoiding going out to restaurants and theaters (Liska, Sanchirico, and Reed, 1988), eschewing public transportation (Jackson and Gray, 2010), and reducing participation in social (e.g., seeing friends or talking to neighbors) and physical (e.g., exercising) activities (Foster et al., 2014; Stafford, Chandola, and Marmot, 2007). In a recent longitudinal analysis, Melde, Berg, and Esbensen (2016) found that youth who reported greater fear of victimization were more likely to avoid risky social activities and settings in the future. More generally, research findings have shown that "emotions play a critical role in forward-looking decision-making" (Camerer, Loewenstein, and Prelec, 2005: 41).

Building on the evidence from studies of fear of crime, we propose five hypotheses about the nature and effects of fear of apprehension in criminal deterrence. We list these hypotheses below and then in the following section further unpack the theoretical relevance of each to both situational offending and criminal propensity. The first hypothesis is that fear of apprehension should be empirically distinct from cognitive judgments about sanction risk. Second, cognitive judgments about sanction risk, especially the perceived likelihood of getting caught, should predict fear of apprehension. Third, perceived sanction risk should at least partially mediate the relationships between signals—environmental, experiential, or nonexperiential—about the level of objective sanction risk and fear of apprehension (Cusson, 1993). Stated differently, the various sources of information about sanction risk identified in prior research, such as prior offending or arrest (Anwar and Loughran, 2011; Matsueda, Kreager, and Huizinga, 2006), should have indirect effects on fear through perceived risk, although they may also have direct effects on fear (Loewenstein et al., 2001).[4] Fourth, given the general evidence that "*emotional processes* have a larger role in motivating avoidance behavior than cognitive assessments" (Melde, Berg, and Esbensen, 2016: 486), fear of apprehension should exert a larger effect than perceived sanction risk on criminal decision-making. Fifth, perceived sanction risk should have an indirect effect on criminal decision-making through fear of apprehension. As Loewenstein et al. (2001: 274) suggested, "feelings may … to a large degree, mediate the connection between cognitive evaluations of risk and risk-related behavior." We test these five hypotheses in this study.

FEAR AND DETERRENCE: SITUATIONAL OFFENDING AND CRIMINAL PROPENSITY

Dating back to the seminal works of Matza (1967) and Cohen and Felson (1979), scholars have advocated for "a situational conception of motivation" and for the need to

4. Independent of perceived certainty, it is possible that some factors may influence fear of apprehension by affecting perceived control or the salience of different consequences of apprehension (see Jackson, 2011). We discuss this possibility at greater length in the conclusion. Additionally, as one anonymous reviewer observed, some stimuli may exert direct effects on fear by bypassing the prefrontal cortex and having an instant influence on the limbic system, especially the amygdala.

"reject a categorical distinction between offenders and nonoffenders" (Osgood et al., 1996: 638–9). Likewise, deterrence scholars increasingly have highlighted the situational aspects of offending, suggesting that deterrence variables should be measured and assessed in the context of specific criminal opportunities (Apel, 2013; Nagin, 2013; Wikström, 2006). Cusson (1993) was an early advocate for this view. He contended that "deterrence theory is at an impasse because it ignores the temporal and situational contingencies of the criminal act as well as the emotional components of intimidation" (p. 61). More recently, Nagin, Solow, and Lum (2015: 81) asserted that "a discussion of the probability of apprehension without reference to the characteristics of the criminal opportunity is ill posed."

There is mounting evidence that individuals' cognitive judgments about sanction risk and felt level of negative affect are responsive to the specific opportunity context. For instance, in one set of experiments, Pogarsky, Roche, and Pickett (2017) showed that cognitive judgments about sanction risk are highly sensitive to various "situational signals" that influence intuitive reasoning processes. Similarly, Loughran et al. (2016) found that simply carrying a gun reduced the perceived likelihood of apprehension. van Gelder et al. (2017) found that individuals involved in a specific, albeit virtual, burglary event experienced physiological indicators of fear, such as an elevated heart rate.

Researchers have also begun to distinguish the cognitive and emotional dimensions of situational deterrence (van Gelder et al., 2014). In two studies, van Gelder and de Vries (2012, 2014) explored the general negative state affect connected to specific criminal decisions (e.g., "Does the situation evoke negative feelings in general?"). In both studies, they found that general negative feelings have a deterrent effect, independent of perceived sanction risk. Nevertheless, in neither study did they directly assess fear of apprehension. This is important because there are many reasons why offenders might experience negative affect in criminal situations, and some have little to do with the justice system. For instance, offenders often worry about being harmed by victims or bystanders during crimes (Copes, Hochstetler, and Cherbonneau, 2012; Melde, Berg, and Esbensen, 2016). Additionally, van Gelder and de Vries (2012, 2014) were unable to control for past offending or for prior personal or vicarious apprehension experiences, which might influence both state negative affect as well as offending. Nonetheless, we believe their findings provide strong support for the notion that state emotions influence offending decisions within the context of specific criminal opportunities.

At the same time, perhaps the most consistent finding reported in the criminological literature is that much of the variance in criminal offending is extra-situational (Gottfredson and Hirschi, 1990; Sampson and Laub, 1993). Terms like "chronic offenders" (Wolfgang, Figlio, and Sellin, 1972), "career criminals" (Blumstein et al., 1986), "life-course-persistent offenders" (Moffitt, 1993), and "acute conformists" (Pogarsky, 2002) convey that some individuals have a comparatively high (or low) likelihood of offending, irrespective of the characteristics of any given criminal opportunity (Jacobs, 2010).

Although there are many explanations for stable individual differences in criminal propensity (Wikström and Sampson, 2006), deterrence researchers have yet to give adequate theoretical attention to how deterrence may contribute to variation across persons in the propensity to offend, or how propensity shapes situational deterrence processes (Jacobs, 2010; Piquero et al., 2011). One line of argument is that many individuals become

habituated to conformity—that is, they quit (or perhaps never start) considering criminal opportunities—and thus give little thought to situational deterrence variables (Pogarsky, 2002; Wikström, 2006; Wikström, Tseloni, and Karlis, 2011; Zimring and Hawkins, 1973). As Andenaes (1966: 951) put it: "with fear or moral influences as an intermediate link, it is possible … perhaps to establish a condition of habitual lawfulness … [where] illegal actions will not present themselves consciously." Another argument is that some individuals are more deterrable because they have higher risk sensitivity (Jacobs, 2010). Other scholars contend that perceived sanction risk is unable to account for individuals' propensity to offend, even if it can help explain situational decisions within specific crime events (Cullen and Pratt, 2016: 801).

In their rational choice model, however, Clarke and Cornish (1985) insightfully suggested that the effects of background factors (e.g., upbringing and personality) and current life circumstances (e.g., neighborhood conditions and employment) on criminal decision-making may, in part, be indirect through situational deterrence variables. van Gelder and de Vries (2012, 2014) made similar arguments. Thus, the same factors shaping one's criminal propensity may also influence perceptions and behavior within specific situations (Nagin and Paternoster, 1994; Piquero and Tibbetts, 1996; Piquero et al., 2011). This line of reasoning is consistent with the theory of planned behavior (TPB), which posits that individuals' demographic and environmental characteristics as well as personality traits shape their general behavioral beliefs—perceptions of the outcomes and costs of performing behaviors—and control beliefs—perceptions of the ease of behavioral performance (Ajzen, 1991, 2011; Montaño and Kasprsyk, 2015). In turn, according to TPB, behavioral and control beliefs should affect behavioral intentions, which are the most proximate and important determinant of behavior in specific situations (Ajzen, 1991; Montaño and Kasprsyk, 2015).

An emphasis on stable individual differences in responses, both cognitive and emotional, to situational factors fits well with a conception of criminal propensity as continuous rather than as discrete—that is, as a matter of degree, instead of a hard distinction between offenders and nonoffenders—and as exerting varying effects in different situations (Jacobs, 2010; Osgood et al., 1996). Per deterrence theory, criminal propensity is best conceptualized as a person's general willingness to consider criminal opportunities (Pogarsky, 2002; Wikström, Tseloni, and Karlis, 2011). Theoretically, two extra-situational factors that should influence both criminal propensity and situational motivation are generalized perceptions of sanction risk and generalized fear of apprehension. Because of their backgrounds and experiences, individuals are likely to develop global or generalized perceptions and feelings that are independent of any given situation (Ajzen, 2011). Under this model, individuals would evaluate specific criminal opportunities through the lens of their generalized perceptions and feelings. Yet, their situational perceptions and feelings would ultimately drive their situational offending decisions.

Returning to the literature on fear of crime, there is strong evidence that fear is responsive to the characteristics of specific situations (Sayin et al., 2015; Solymosi, Bowers, and Fujiyama, 2015). Situational factors, such as the absence of other people, the presence of graffiti or litter, and darkness, quietness, or unfamiliar circumstances, increase fear (Sayin et al., 2015; Warr, 1990, 2000). Importantly, however, fear is experienced generally as diffuse and enduring anxiety about crime (Farrall, Jackson, and Gray, 2009; Gray, Jackson, and Farrall, 2011; Warr, 2000). Moreover, outside of specific situations, anxieties about

different types of victimization (e.g., assault; burglary) are highly correlated and reflect a single latent construct (Ferraro, 1995).

There is also evidence that individuals have generalized or global perceptions of arrest risk. In the Pathways to Desistance Study, for instance, offenders reported their perceptions of the certainty of arrest for seven different crimes—fighting, vandalism, auto theft, robbery with a gun, stabbing someone, breaking into a store or home, and stealing clothes from a store. Across these crimes, the perceptions can be combined into a single index with high internal consistency (alpha = .89; Loughran et al., 2012, 2016). And a one-factor model fits the data well.[5] Researchers analyzing data from other surveys have also found that perceptions of arrest risk for different offenses tend to be highly intercorrelated and reflect a single latent construct (Kim, Pratt, and Wallace, 2014; Pickett and Bushway, 2015).

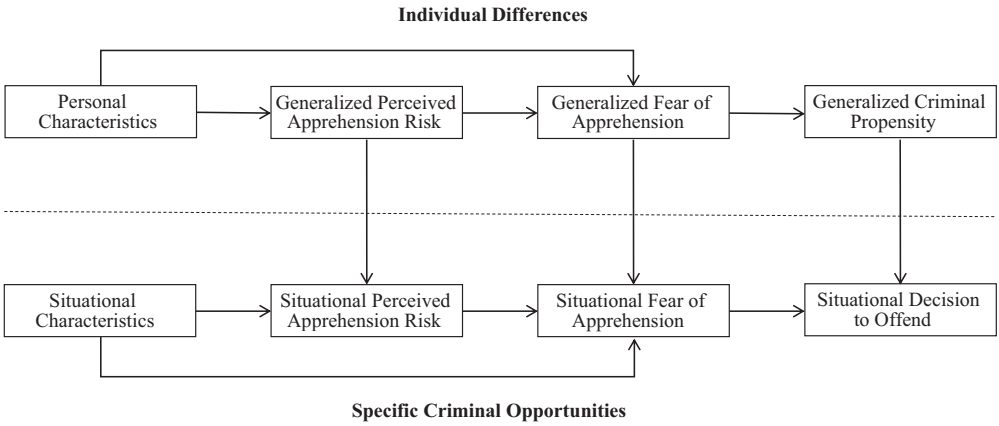
Deterrence researchers have also documented considerable "state dependence" in perceptions of sanction risk. Independent of any specific situation, individuals' prior level of perceived risk is one of the strongest predictors of their current level of perceived risk (Lochner, 2007; Matsueda, Kreager, and Huizinga, 2006; Thomas, Loughran, and Piquero, 2013). Dovetailing with this research is the finding that individuals update their perceptions of sanction risk on the basis of personal and vicarious experiences, and then carry these updated perceptions with them beyond any specific criminal opportunity (Anwar and Loughran, 2011; Wilson, Paternoster, and Loughran, 2017). All of this evidence suggests that people develop a generalized conception of sanction risk that influences, perhaps by serving as an anchoring point, their assessments of sanction risk within specific criminal opportunities (Apel and Nagin, 2011; Pogarsky, Roche, and Pickett, 2017). The same should be true for fear of apprehension. For example, individuals' resting heart rates may strongly influence their general tendency to experience fear (Armstrong and Boutwell, 2012; Raine, 2013).

Therefore, rather than being limited in relevance solely to situational decision-making, the deterrence framework may help explain both criminal propensity and situational offending. We posit that individuals develop *generalized* perceptions and feelings about sanction risk, which are influenced by their personality traits, social environments, and prior personal and vicarious experiences (Armstrong and Boutwell, 2012; Kim et al., 2014; Pickett and Bushway, 2015). Generalized perceived risk should directly influence generalized fear and should indirectly influence criminal propensity through its effects on fear. Under this model, "habitual lawfulness" or "acute conformity" would reflect a high generalized fear of apprehension, which should result in a low willingness even to contemplate offending.

Generalized risk and fear should also influence *situational* risk and fear, as should the characteristics of the specific criminal opportunity. Nevertheless, the characteristics of the specific criminal opportunity should have indirect effects on situational fear through situational perceived risk (Cusson, 1993), although situational factors may also have direct effects on situational fear. As Loewenstein et al. (2001: 271) explained, "people's emotional reactions to risks depend on a variety of factors that influence cognitive evaluations of risk only weakly or not at all." For example, sexual arousal or intoxication may directly reduce fear. Likewise, the presence of co-offenders may directly reduce fear, as

5. See http://www.pathwaysstudy.pitt.edu/.

Figure 1. Bifurcated Theoretical Model of Emotional Deterrence



well as indirectly reduce fear by lessening perceived risk (McGloin and Thomas, 2016). Situational risk and fear should then influence situational offending decisions, with fear having a more proximate and powerful effect than risk (Loewenstein et al., 2001). Our full theoretical model is displayed in figure 1. We test each hypothesized relationship shown in the figure.

METHOD

To test our hypotheses, we embedded a set of experimental vignettes in a survey administered during the summer of 2016 to a nationwide sample of adult (18 and older) residents of the United States. Although perceptual deterrence researchers have commonly surveyed college students (Kamerdze et al., 2014; McGloin and Thomas, 2016; van Gelder and de Vries, 2014), we opted instead to use a national crowdsourced sample to achieve greater heterogeneity among participants. The participants were recruited from Amazon's Mechanical Turk™ (MTurk).[6] Mullinix et al. (2015) tested the generalizability of MTurk samples and were able to replicate both the direction and the statistical significance of 29 (or 81 percent) of 36 treatment effects previously documented in probability samples of the American public (see also Weinberg, Freese, and McElhatten, 2014). More generally, across a variety of topics, researchers have found that the use of an online convenience sample most often allows for accurate inferences about the direction and approximate magnitude of relationships among variables (Ansolabehere and Schaffner, 2014; Bhutta, 2012; Pasek, 2016; Simmons and Bobo, 2015).

MTurk "workers" are individuals who voluntarily signed up to participate in various human intelligence tasks (HITs; e.g., translating text, tagging photos or videos, or taking surveys) for money. There are several hundred thousand workers from different countries. We posted a link to our survey on the MTurk website and offered workers a small monetary fee to participate. To ensure comprehension of the questionnaire, which was

6. MTurk samples are widely used in academic research (e.g., Dowling and Wichowsky, 2014; Pogarsky, Roche, and Pickett, 2017; Ratner et al., 2014).

written in English, and a minimum degree of shared criminal justice context, we limited participation to workers who resided in the United States. We also restricted participation to workers with an approval rating on prior HITs of at least 95 percent. Peer, Vosgerau, and Acquisti (2013) showed that imposing this restriction substantially increases the quality of data in MTurk surveys. Along with these two qualifications, all workers with at least 50 prior HITs, which was the lowest possible experience threshold other than having no threshold, were allowed to participate.

The rate of missing data in the survey—both from breakoff and item nonresponse—was low. In total, 1,012 workers began the survey and 1,001 (or 99 percent) finished it. After excluding cases with item nonresponse on the variables used in the analysis, the analytic sample was reduced to 965. The descriptive statistics for the sample are presented in appendix A. The sample is Whiter, younger, and more highly educated than the general public. This is highly consistent with prior research that included MTurk samples (Levay, Freese, and Druckman, 2016; Shank, 2016; Weinberg, Freese, and McElhattan, 2014).

GENERALIZED RISK AND FEAR

At the beginning of the survey, before the experimental vignettes, we measured generalized perceived risk and fear of apprehension. The approach we used to measure these constructs was informed by the literature on fear of crime, which has provided the following methodological insights (Farrall, Jackson, and Gray, 2009; Ferraro, 1995; Ferraro and LaGrange, 1987). First, perceived risk should be measured with questions asking about likelihood or probability, whereas fear should be measured with questions that tap emotional feelings, such as "how afraid are you" or "how worried are you?" Second, measures of risk and fear should include explicit reference to specific types of crime and cover a diverse range of offenses—nonviolent and violent, nonserious and serious—to promote content validity.

To measure generalized risk and fear, we asked respondents to think about committing several different generic crimes. We then separately asked them 1) how likely or unlikely (1 = very unlikely, 7 = very likely) it was they would be caught if they committed it, and 2) how afraid or unafraid (1 = very unafraid, 7 = very afraid) they would be of getting caught.[7] The crimes varied in seriousness and were presented with minimal situational details. We measured both generalized risk and fear for the same six crimes. The exact wording for both survey questions is shown in table 1. We measured generalized perceived risk by constructing an index ($\alpha = .859$) equal to the average perceived apprehension risk across the six crimes. Likewise, we averaged across the fear responses for the same six crimes to create an index measuring generalized fear of apprehension ($\alpha = .879$).

Recall that our first hypothesis is that perceived apprehension risk and fear are empirically distinct. We tested this hypothesis by conducting an exploratory factor analysis with promax rotation for all 12 individual risk and fear items. The results are presented in table 1. As expected, and consistent with findings from research on fear of crime, the risk

7. Some scholars have argued against the use of hypothetical measures of fear (Ferraro and LaGrange, 1987). Yet making this argument overlooks humans' strong capacity to experience thought-induced feelings, as well as the central importance of such deliberative or anticipatory affect for understanding the influence of emotions on forward-looking decision-making (Camerer, Loewenstein, and Prelec, 2005; Giner-Sorolla, 2001; van Gelder and de Vries, 2014).

Table 1. Question Wording, Descriptive Statistics, and Factor Loadings for Generalized Perceived Apprehension Risk and Generalized Fear of Apprehension

Index *Survey Question*	**Mean**	**SD**	**Factor 1**	**Factor 2**
Generalized Risk ($\alpha = .859$): "We are interested in your perceptions of the RISK of arrest. Imagine that you committed the following crimes. For each crime, indicate how likely or unlikely it is that you would get CAUGHT by the police."				
Risk DUI: "Drove drunk"	4.56	1.75	.024	**.585**
Risk Buy Drugs: "Bought an illegal drug like cocaine"	4.04	1.79	−.054	**.591**
Risk Theft: "Stole something like a video game from a store"	4.76	1.71	−.020	**.740**
Risk Assault: "Punched a stranger who insulted you"	4.87	1.83	.048	**.658**
Risk Burglary: "Broke into a building or car to steal something"	5.09	1.82	.025	**.859**
Risk Robbery: "Mugged someone"	5.18	1.86	−.003	**.852**
Generalized Fear ($\alpha = .879$): "Previously we asked about risk. Now we would like to ask you about EMOTIONAL FEAR. Again, please imagine that you committed the following crimes. For each crime, indicate how AFRAID or UNAFRAID you would be of getting CAUGHT by the police."				
Fear DUI: "Drove drunk"	5.47	1.75	**.601**	.063
Fear Buy Drugs: "Bought an illegal drug like cocaine"	5.35	1.85	**.638**	.040
Fear Theft: "Stole something like a video game from a store"	5.63	1.64	**.785**	.017
Fear Assault: "Punched a stranger who insulted you"	5.28	1.77	**.615**	.079
Fear Burglary: "Broke into a building or car to steal something"	6.03	1.57	**.900**	−.029
Fear Robbery: "Mugged someone"	6.15	1.55	**.884**	−.023
Variance	—	—	4.218	4.056

NOTE: The bivariate correlation between generalized risk and generalized fear is $r = .457$.
ABBREVIATIONS: DUI = driving under the influence; SD = standard deviation.

and fear items load on two separate factors corresponding to perceived apprehension risk and fear of apprehension.[8] Also consistent with our expectations, the indices measuring generalized risk and fear are moderately and positively correlated ($r = .457$). Thus, as hypothesized, perceived sanction risk and fear of apprehension are empirically, as well as theoretically, distinct.

GENERALIZED CRIMINAL PROPENSITY

In a deterrence framework, criminal propensity can be conceptualized as individuals' general willingness to contemplate committing crimes (Pogarsky, 2002; Wikström, Tseloni, and Karlis, 2011). We therefore operationalized respondents' generalized propensity for crime as their self-reported openness to entertaining opportunities for criminal offending. We used the same six crimes that were used previously to measure generalized risk and fear. Specifically, after the questions about generalized risk and fear,

8. In the survey, one additional crime was included in the questions for generalized risk and fear: "bought something that you thought was stolen." We excluded this crime because it loads poorly in the case of both risk and fear. Nevertheless, the same multivariate findings are obtained when this crime is included in the indices.

we asked respondents whether they "would ever CONSIDER doing any of the following things?" Respondents were then presented with the same crimes and indicated their willingness to consider offending on a 7-point scale that ranged from 1 = no to 7 = yes, where 4 = maybe. We averaged across the responses for the different crimes to generate an index measuring respondents' generalized criminal propensity ($\alpha = .759$). A factor analysis confirmed that the items loaded on a single factor with loadings between .472 and .835.

SITUATIONAL RISK, FEAR, AND INTENTIONS TO OFFEND

Cusson (1993: 65) and others (Jacobs, 2010) have argued that deterrence researchers must "deal with the real fears generated by specific situational risks that have an immediate effect on an offender's decisions." Toward this end, we included separate indicators of situational perceived apprehension risk, fear of apprehension, and intentions to offend. In measuring these variables, we used an experimental approach similar to that employed by Nagin and Paternoster (1993). Specifically, respondents were presented with experimental vignettes describing specific criminal opportunities, in which situational characteristics that should influence objective apprehension risk were randomized. Each vignette with experimental manipulations (underlined) appears as follows:

> ***Insurance Fraud:*** "Now, imagine that your car is damaged in an accident. [Your close friend repairs cars. He tells you … / You go to a repair shop. The owner tells you …] that if you bring your car to him to fix, he will overcharge the insurance company [$2,000 / $400], and you two can split that [$2,000 / $400] to keep for yourselves. This is insurance fraud."
>
> ***Drunk Driving:*** "Now, imagine that you drove by yourself one evening to meet some friends at a bar. You live about [2 / 20] miles away. By the end of the evening, you've had enough to drink that you are sure you are intoxicated. [The police in the area have recently introduced a crackdown on drunk driving / The police in the area have recently faced cutbacks and are patrolling less often]."
>
> ***Purchasing Stolen Device:*** "Now, imagine that you want a new [iPhone, which normally costs a few hundred dollars / MacBook laptop computer, which normally costs over a thousand dollars]. One of your friends mentions that he knows someone who sells [iPhones / MacBooks] very cheaply. These devices look new and come in the original packaging. Your friend also mentions these devices probably 'fell off a truck' somewhere, so there is no receipt. It is illegal to buy, possess, or sell goods that one knows (or reasonably could know) have been criminally obtained. [You just read that Apple is working with the police on a new initiative to track stolen products.]"

After reading each vignette, respondents were asked how likely or unlikely they would be to get apprehended by the police if they committed the specific crime described therein (1 = very unlikely, 7 = very likely), how unafraid or afraid they would be of being apprehended if they committed the crime (1 = very unafraid, 7 = very afraid), and the percent chance (0–100 percent) that they would actually commit the crime if they were in the situation.

Table 2. Regressions Predicting Generalized Fear of Apprehension and Generalized Criminal Propensity ($N = 965$)

	DV = Generalized Fear		DV = Generalized Propensity	
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Generalized fear	—	—	—	−.159***
Generalized risk	—	.415***	−.105***	−.039
Low self-control	−.029	−.001	.187***	.186***
Prior offending	−.163***	−.142***	.446***	.423***
Prior arrest	−.104**	−.071*	.147***	.135***
Vicarious arrest	−.060	−.062*	.078**	.068**
Male	−.162***	−.117***	.036	.017
White	.027	.026	.010	.014
Age	.016	.007	−.050	−.049
Education	.011	.018	.002	.005
Adjusted R^2	.097	.263	.400	.418

NOTE: Standardized regression coefficients are shown.
ABBREVIATION: DV = dependent variable.
*$p < .05$; **$p < .01$; ***$p < .001$ (two–tailed).

CONTROL VARIABLES

To minimize omitted variable bias, we control for variables that may simultaneously influence both our independent and dependent variables. Controls are included for previous offending, prior personal and vicarious arrest experiences, low self-control, and demographic characteristics. Prior offending was measured with an index ($\alpha = .849$) equal to the average across responses (0 = none, 5 = 8+ times) to six items asking about the frequency of prior involvement in various crimes (e.g., "Driven while intoxicated"; "Punched a stranger who insulted you"). Prior personal arrest was measured ordinally (0 = none, 3 = 4+ times). For prior vicarious arrest, respondents who reported having family members or close friends who had been arrested were coded "1," with others coded "0." We measured low self-control by averaging across responses to six items from the Grasmick et al. (1993) self-control scale ($\alpha = .738$; e.g., "I often act on the spur of the moment without stopping to think"; "I lose my temper pretty easily"). Finally, we controlled for respondents' gender (male = 1), race (White = 1), age in years, and educational attainment (1 = high school or less, 5 = graduate degree).

RESULTS

The first portion of our analysis tests the hypothesis that background factors will have indirect effects on generalized fear through generalized perceived risk. Table 2 presents the standardized coefficients from four linear regression models. Generalized fear is the outcome in models 1 and 2, and generalized propensity is the outcome in models 3 and 4. Model 1 contains coefficients for the associations between the controls and generalized fear. Prior offending, having a prior arrest, and being male are all significantly and negatively associated with generalized fear. Model 2 includes the measure of generalized perceived risk. As hypothesized, there is a substantial and highly significant positive relationship between generalized risk and fear. Net of generalized perceived risk, prior offending, prior arrest, and gender all continue to have significant direct negative

associations with generalized fear. Yet, the magnitude of each of these relationships is reduced in comparison with model 1, in which generalized perceived risk is omitted. We use bias-corrected bootstrap ($k = 1{,}000$) confidence intervals (95 percent) to test whether these background variables exert indirect effects on generalized fear through generalized perceived risk (Hayes, 2013; Zhao, Lynch, and Chen, 2010). Consistent with our hypotheses, two of the three variables—having a prior arrest ($b = -.064$, $p < .05$, confidence interval [CI] = −.120 to −.013) and being male ($b = -.120$, $p < .01$, CI = −.201 to −.048)—have significant indirect relationships with generalized fear through generalized perceived risk.

Consistent with our hypotheses, the results thus far show that generalized perceived risk is positively associated with generalized fear and that some background factors have indirect effects on generalized fear through generalized perceived risk. We next test the hypotheses that 1) generalized perceived risk will be negatively associated with generalized criminal propensity and that 2) this relationship will be mediated by generalized fear. The respective results are shown in models 3 and 4 of table 2. By first examining the results in model 3, we observe a significant negative association between generalized perceived risk and generalized propensity, net of the controls. Respondents who believe that the general level of apprehension risk is higher tend to be less willing to consider criminal opportunities. Yet, the results in model 4 reveal that this relationship is entirely mediated by generalized fear, which is significantly and negatively related to generalized propensity. Respondents who are more afraid of apprehension tend to be less open to considering crimes. The indirect effect of generalized perceived risk on generalized propensity through generalized fear is highly significant ($b = -.044$, $p < .001$, CI = −.066 to −.027). The inclusion of generalized fear significantly increases the explanatory power of the model ($F = 30.41$, $p < .001$). Collectively, the variables in the full model explain approximately 42 percent of the variance in generalized propensity. These findings support each hypothesized linkage for the individual differences component of our theoretical model (see figure 1).

Attention now turns to situational perceived risk, situational fear, and intentions to offend. The first step is to test whether, as hypothesized, situational perceived risk is a function of both generalized perceived risk and the specific characteristics of the criminal opportunity, which we randomized in the experimental vignettes. Table 3 presents the standardized coefficients from three linear regression models predicting situational perceived risk for each of the three criminal opportunities. For each offense, there is a sizable positive association between generalized perceived risk and situational perceived risk, and this association is statistically significant at the $p < .001$ level. However, situational perceived risk is also sensitive to the characteristics of the specific criminal opportunity. Even when controlling for generalized risk, five of the six experimental manipulations exert significant effects on situational perceived risk, and they do so in logical ways. In the insurance fraud scenario, the involvement of a friend rather than a stranger reduces perceived risk, whereas defrauding the insurance company of $2,000 rather than $400 increases perceived risk (model 1). In the drunk driving scenario, a longer driving distance and higher police enforcement both increase situational perceived risk (model 2). Higher police enforcement also significantly increases situational perceived risk in the scenario for buying a stolen device, but the device type (which determines the device's monetary value) does not have a statistically significant effect (model 3).

Table 3. Regressions Predicting Situational Perceived Apprehension Risk ($N = 965$)

Variable	Model 1: Insurance Fraud	Model 2: Drunk Driving	Model 3: Buying Stolen Device
Generalized risk	.171***	.243***	.180***
Situational characteristics	—	—	—
Shop owner (reference)	—	—	—
Close friend	−.063*	—	—
Amount $400 (reference)	—	—	—
Amount $2,000	.085**	—	—
Police cutbacks (reference)	—	—	—
Police crackdown	—	.394***	—
Distance 2 miles (reference)	—	—	—
Distance 20 miles	—	.082**	—
No police tracking (reference)	—	—	—
Police tracking	—	—	.260***
iPhone (reference)	—	—	—
MacBook	—	—	.007
Low self-control	.050	−.024	.067*
Prior offending	.024	−.020	.072*
Prior arrest	−.049	−.069*	−.087*
Vicarious arrest	−.049	.048	−.012
Male	−.061	−.048	−.080*
White	−.000	−.036	−.032
Age	−.070*	−.010	.065*
Education	−.083*	−.067*	−.019
Adjusted R^2	.051	.239	.113

NOTE: Standardized regression coefficients are shown.
$*p < .05$; $**p < .01$; $***p < .001$ (two–tailed).

Per our theoretical model, situational characteristics should have indirect effects on situational fear through situational perceived risk. Additionally, generalized perceived risk should have indirect effects on situational fear through generalized fear. Table 4 displays the standardized coefficients from three linear regression models predicting situational fear. First, as hypothesized, for each of the three criminal opportunities, there is a sizable and highly significant positive association between situational perceived risk and situational fear. Second, none of the situational characteristics have direct effects on situational fear. Still, as predicted, five of the six situational characteristics have significant indirect effects on situational fear through situational perceived risk: close friend ($b = -.078$, $p < .05$, CI = −.159 to −.006), amount $2,000 ($b = .110$, $p < .01$, CI = .032 to .194), police crackdown ($b = .479$, $p < .001$, CI = .373 to .602), distance 20 miles ($b = .101$, $p < .01$, CI = .035 to .174), and police tracking ($b = .588$, $p < .001$, CI = .449 to .738). Additionally, even after accounting for situational characteristics and situational perceived risk, generalized fear continues to be significantly and positively related to situational fear in each model. Generalized perceived risk, on the other hand, is not directly related to situational fear. For each offense, however, generalized perceived risk has a significant indirect effect on situational fear through generalized fear: insurance fraud ($b = .125$, $p < .001$, CI = .079 to .179), drunk driving ($b = .108$, $p < .001$, CI = .069 to .158), and buying a stolen device ($b = .100$, $p < .001$, CI = .060 to .150). To this point, then, each hypothesized relationship depicted in figure 1 is supported.

The final part of the analysis tests the last three hypotheses from our theoretical model. First, generalized propensity should influence situational intentions to offend. Second,

Table 4. Regressions Predicting Situational Fear of Apprehension ($N = 965$)

Variable	Model 1: Insurance Fraud	Model 2: Drunk Driving	Model 3: Buying Stolen Device
Situational risk	.345***	.385***	.585***
Generalized fear	.243***	.241***	.174***
Generalized risk	.018	.033	−.005
Situational characteristics	—	—	—
Shop owner (reference)	—	—	—
Close friend	−.034	—	—
Amount $400 (reference)	—	—	—
Amount $2,000	.011	—	—
Police cutbacks (reference)	—	—	—
Police crackdown	—	.035	—
Distance 2 miles (reference)	—	—	—
Distance 20 miles	—	−.006	—
No police tracking (reference)	—	—	—
Police tracking	—	—	.010
iPhone (reference)	—	—	—
MacBook	—	—	.035
Low self-control	−.046	−.088**	−.005
Prior offending	−.078*	−.086**	−.054*
Prior arrest	−.058	−.008	−.067*
Vicarious arrest	−.020	.047	−.002
Male	−.041	−.008	−.033
White	.039	.029	.040
Age	.025	−.000	.055*
Education	−.007	.006	.017
Adjusted R^2	.262	.310	.447

NOTE: Standardized regression coefficients are shown.
$*p < .05$; $**p < .01$; $***p < .001$ (two–tailed).

net of generalized propensity, situational perceived risk and situational fear should be negatively associated with situational intentions to offend. Third, situational fear should mediate the relationship between situational perceived risk and situational intentions to offend. The respective results are shown in table 5. Two models are estimated for each offense, one excluding and one including situational fear. As hypothesized, for each offense, generalized propensity is positively and significantly related to offending intentions. In each case, situational perceived risk is also significantly and negatively related to offending intentions (models 1, 3, and 5). In all three cases, this relationship is reduced substantially when situational fear is included in the model (models 2, 4, and 6). Situational fear is significantly and negatively associated with offending intentions for each offense. As hypothesized, in every instance, situational perceived risk has a significant indirect effect on offending intentions through situational fear: insurance fraud ($b = -1.510$, $p < .001$, CI $= -2.011$ to -1.107), drunk driving ($b = -.999$, $p < .001$, CI $= -1.523$ to $-.589$), and buying a stolen device ($b = -3.008.$, $p < .001$, CI $= -3.830$ to -2.205). For drunk driving and buying a stolen device, situational perceived risk also has a significant direct effect on offending intentions, net of situational fear.

The magnitude of the relationship between situational fear and intentions to offend is notable. For two offenses, insurance fraud and buying a stolen device, situational fear has a larger standardized coefficient than any other variable in the model, including

Table 5. Regressions Predicting Situational Intentions to Offend ($N = 965$)

	Insurance Fraud		Drunk Driving		Buying Stolen Device	
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Situational fear	—	−.296***	—	−.186***	—	−.324***
Situational risk	−.112***	−.010	−.172***	−.101**	−.270***	−.082*
Generalized propensity	.226***	.196***	.230***	.228***	.191***	.176***
Generalized fear	−.059	.008	−.029	.016	−.027	.027
Generalized risk	.022	.026	.020	.026	.009	.007
Situational characteristics	—	—	—	—	—	—
Shop owner (reference)	—	—	—	—	—	—
Close friend	.109***	.099***	—	—	—	—
Amount $400 (reference)	—	—	—	—	—	—
Amount $2,000	.003	.006	—	—	—	
Police cutbacks (reference)	—	—	—	—	—	—
Police crackdown	—	—	−.061	−.054	—	—
Distance 2 miles (reference)	—	—	—	—	—	—
Distance 20 miles	—	—	−.032	−.033	—	—
No police tracking (reference)	—	—	—	—	—	—
Police tracking	—	—	—	—	−.013	−.009
iPhone (reference)	—	—	—	—	—	—
MacBook	—	—	—	—	.037	.048
Low self-control	.137***	.129***	.099**	.083**	.078*	.080**
Prior offending	.139***	.129***	.193***	.178***	.102**	.091**
Prior arrest	.049	.036	.022	.021	.055	.035
Vicarious arrest	.018	.014	−.067	−.058*	−.049	−.049
Male	−.020	−.032	−.003	−.005	−.042	−.053
White	−.050	−.037	−.031	−.025	−.039	−.026
Age	−.110***	−.105***	.029	.029	−.138***	−.121***
Education	.006	.004	.039	.040	−.041	−.036
Adjusted R^2	.240	.304	.233	.256	.218	.275

NOTE: Standardized regression coefficients are shown.
$*p < .05$; $**p < .01$; $***p < .001$ (two–tailed).

generalized propensity, low self-control, and prior offending. Every unit (standard deviation) increase in situational fear is associated with a 4.449 unit (.296 standard deviation) decrease in intentions to commit insurance fraud, as measured on the 0–100 percent scale, and with a 4.924 (.324 standard deviation) decrease in intentions to buy a stolen device. For drunk driving, situational fear is the second strongest predictor of intentions to offend, exceeded only by generalized propensity. Here every unit (standard deviation) increase in situational fear is associated with a 2.988 unit (.186 standard deviation) decrease in intentions to drive drunk.

Depending on the offense, including situational fear in the model increases the adjusted R^2 by 10 percent to 27 percent, which is a significant improvement in explanatory power (models 1–2: $F = 87.91$, $p < .001$; models 3–4: $F = 30.66$, $p < 001$; models 5–6: $F = 75.80$, $p < .001$). But it is also instructive to consider the explanatory power of the full models in table 5 when compared with models specified similar to those typically estimated in perceptual deterrence studies—that is, models that include only situational perceived risk and the controls. Here the increase in explanatory power achieved by including situational fear and the generalized deterrence variables (fear, risk and propensity) ranges from 27 percent to 48 percent. In short, including a fuller range of theoretically relevant deterrence variables—cognitive and emotional,

generalized and situational—dramatically increases our ability to explain respondents' criminal intentions.

SUPPLEMENTARY ANALYSES

To assess the robustness of our findings, we test whether the empirical distinction between perceived risk and fear of apprehension may reflect socially desirable responding by male respondents to the fear questions, as a result of masculine norms (Goodey, 1997).[9] Indeed, relative to female respondents, the males in our study tended to report lower levels of fear of apprehension. Likewise, within the literature on fear of crime, there is consistent evidence that, males report being less afraid of being victimized than females (Farrall, Jackson, and Gray, 2009; Warr, 2000).[10] Accordingly, we conducted supplementary analyses disaggregated by gender (see the online supporting information[11]). The results of separate factor analyses confirmed that perceived risk and fear of apprehension are empirically distinct among both male and female respondents. Additionally, similar relationships emerge between perceived risk, fear, general propensity, and situational intentions to offend among both male and female respondents. In short, the evidence shows that our theoretical model is applicable to both genders.

DISCUSSION AND CONCLUSION

> *Do you want to prevent crimes?… See to it that men fear the laws and fear nothing else. For fear of the laws is salutary…*
>
> —Cesare Beccaria (1963 [1764]: 94)

Like Hobbes (1957 [1651]), Beccaria (1963 [1764]) identified the theoretical importance of emotions for deterrence. He also argued that the same sanction regime, even if accurately perceived by the populace, would inspire different affective reactions depending on the context. He observed, for example, that because emotions are dynamic and adaptive, "after a hundred years of cruel torments the wheel inspires no greater fear than imprisonment once did" (p. 43). With few exceptions (van Gelder and de Vries, 2012, 2014), this crucial distinction between the level of risk, real or perceived, and the feelings of dread or worry that it induces, has been lost in the contemporary literature on deterrence (Cusson, 1993).

Our data provide strong evidence that perceived risk and fear of apprehension are empirically distinct and that both are important for understanding criminal decision-making. The findings show that perceived apprehension risk is positively related to fear of apprehension, at both a general level and within specific criminal opportunities. At the general level, background factors have indirect effects on generalized fear through generalized perceived risk. Likewise, in specific criminal opportunities, situational

9. We thank an anonymous reviewer for raising this possibility.
10. The leading explanation for why men, relative to women, report being less afraid of crime points to substantive variation by gender in anxieties about the potential for all crimes to lead to sexual assault, rather than to differences in socially desirable responding (Ferraro, 1995, 1996).
11. Additional supporting information can be found in the listing for this article in the Wiley Online Library at http://onlinelibrary.wiley.com/doi/10.1111/crim.2018.56.issue-1/issuetoc.

characteristics have indirect effects on situational fear through situational perceived risk. Fear, in turn, mediates the effects of perceived apprehension risk on criminal decision-making, in the case of both criminal propensity (openness to crime) and situational offending intentions. Including fear in the models significantly increases explanatory power for both criminal propensity and situational offending. Indeed, for most offenses evaluated, fear is the strongest predictor of situational intentions to offend, stronger even than prior offending or self-control.

A focus on crime-related emotions provides new conceptual tools to answer the long-standing empirical puzzles in the deterrence literature. For example, deterrence interventions often have immediate effects that decay over time. This "initial deterrence decay" (Sherman, 1990: 10) has previously been explained purely in terms of cognitive judgments. Offenders ostensibly learned by trial and error that the risk was lower than initially expected (Ross, 1994), or they were simply averse to ambiguity (Nagin, 1998). The introduction of fear of apprehension offers a possible alternative explanation with contrary policy implications. Per the hedonic treadmill model (Easterlin, 1995; Kahneman et al., 2006), human beings quickly return to stable emotional levels despite major positive or negative life events. If deterrence is primarily emotional, hedonic adaptation is a strong explanation for "deterrence decay." Therefore, specific deterrence interventions, such as hot-spots policing, may be most useful in limited doses. More importantly, intensive sustained deterrence interventions may have iatrogenic effects, such that the residents of heavily policed neighborhoods may become habituated to the presence of the police and to the threat of arrest, fundamentally weakening visceral fear of apprehension. Thus, an emotional deterrence framework helps to reconcile the deterrence perspective with more critical perspectives, whose proponents have long argued that the intensive policing of disadvantaged communities can have deleterious effects (Brezina, Tekin, and Topalli, 2009; Clear, 2007; Gau and Brunson, 2010).

In addition, there is considerable policy importance for examining the role of emotions in offender decision-making. The implications of purely cognitive deterrence frameworks (e.g., Bayesian updating models) are mainly limited to efforts to increase the objective risk of arrest (Pickett and Roche, 2016). Nevertheless, for many offenses, it is unclear whether police can substantially influence arrest rates (Braga et al., 2011). In contrast, if deterrence is emotional, any policy that increases fear of apprehension may be a viable deterrence strategy, regardless of whether it impacts the objective level of sanction risk. This may be possible by leveraging inherent heuristics and biases in human decision-making (see, e.g., Pogarsky, Roche, and Pickett, 2017). Such policies may deter crime without necessitating increases in police enforcement levels (Kennedy, 2009; Pickett, Loughran, and Bushway, 2016). For example, policy makers may be able to increase deterrence by employing public communication campaigns designed to evoke emotional reactivity—perhaps by including exemplars or personal stories in commercials about the consequences of offending (see Zillman, 2006). On the other hand, policies aimed at simply increasing police visibility, such as increasing police sentinel activity (Nagin, Solow, and Lum, 2015), may sometimes have the unintended side effect of desensitizing the public, and reducing fear, unless steps are taken to prevent habituation to elevated risk levels.

It bears emphasizing that our theoretical model and emphasis on fear should not be interpreted as automatically providing support for criminal justice interventions designed to increase fear through confrontation, such as Scared Straight (Klenowski, Bell, and Dodson, 2010). First, we are unaware of any direct evidence that Scared Straight had

an impact, much less an enduring impact, on participants' *fear of apprehension* (Petrosino et al., 2013). Second, even if such policies were able to increase fear, any benefits may be offset by other iatrogenic effects, such as peer contagion or diminished perceived efficacy (Petrosino et al., 2013). For example, there is strong meta-analytic evidence that fear appeals are effective at changing behavior, but are most beneficial when interventions also enhance perceived efficacy (Peters, Ruiter, and Kok, 2013; Tannenbaum et al., 2015). By contrast, fear appeals may be ineffective or even harmful if perceived efficacy is undermined (Peters, Ruiter, and Kok, 2013). Accordingly, any intervention designed to deter crime through increased fear should start with a "policy theory" specifying the intended mediating mechanisms (e.g., general or situational fear; Mears, 2010; Sampson, Winship, and Knight, 2013). In turn, evaluation of the intervention's effectiveness should begin with an assessment of whether it did, in fact, influence the intended mediator(s), and whether it might also have had countervailing effects on other mechanisms (e.g., reducing perceived efficacy or increasing associations with delinquent peers).

Turning to the theoretical and research implications of our study, we believe our findings suggest a general need for the field to devote greater attention to theorizing and testing the role of deterrent emotions in crime causation. For instance, Warr (2016) has recently posited that the anticipation of possible regret may be a powerful deterrent of offending, and that the experience of regret may help to motivate desistance from crime. As with fear of apprehension, it seems theoretically plausible that regret is consequential at both the general and situational levels. Criminal propensity may, in part, be a function of individual differences in the tendency to feel regret and accumulated regret experiences, whereas situational decision-making may be influenced by anticipatory regret elicited within the context of specific criminal opportunities. Future studies should be aimed at assessing the independent and cumulative deterrent effects of emotions such as anticipatory regret and fear of apprehension.

Similarly, a leading explanation for gender gap in crime is that males and females differ in their emotional responses to criminogenic strains (Broidy and Agnew, 1997). Prior research results seem to support this theory, showing that males are less likely than females to experience guilt, an emotion that reduces offending (Hay, 2003; Rebellon et al., 2016). We find, however, that the role of emotions in explaining the gender gap in crime may be broader, extending to differences in how males and females respond affectively to the threat of punishment. Specifically, we find that gender is a significant predictor of generalized fear, with males being less likely than females to report fear of apprehension. Generalized fear, in turn, is directly associated with generalized criminal propensity and indirectly associated with situational offending. Interestingly, this finding parallels that of a recent study showing that a significant portion of the gender gap in crime is explained by gender differences in resting heart rate, which should influence general fearfulness (Choy et al., 2017). The evidence herein thus suggests that in future studies, researchers should explore the contribution of a full range of crime-related emotions, including fear of apprehension, to the explanation of gender differences in crime.

An important next step is to begin testing theoretical models explaining fear of apprehension. In the fear of crime literature, the dominant and most empirically supported model is Jackson's (2011) extension of Warr's (1987) "sensitivity to risk" model, which posits that fear of crime is a multiplicative function of perceived likelihood of victimization, severity of victimization, and efficacy (or control; Custers and Van den Bulck, 2013; Jackson, 2015; Jackson and Gouseti, 2016). One particularly promising direction

would be to investigate the applicability of the risk sensitivity model to deterrence. Theoretically, in criminal decision-making, fear of apprehension is a plausible result of the intersection of perceived 1) certainty of apprehension, 2) severity of both informal and formal consequences for offending, and 3) personal efficacy to manage or overcome those consequences—for example, to cope with arrest stigma and commitment costs. Additionally, ambiguity in perceived certainty or severity may promote fear (Loughran et al., 2011; Pickett, Loughran, and Bushway, 2015).

As noted, there is little evidence in the literature that perceived severity of formal sanctions is associated with offending (Loughran et al., 2016; Raaijmakers et al., 2017). It can be difficult, however, to measure perceived severity because individuals often disagree about the severity of any given punishment (May and Wood, 2010). Additionally, measures of perceived severity should include the informal and collateral consequences of offending (Nagin and Paternoster, 1994). One suggestion, then, for testing the risk sensitivity model in the case of deterrence would be to elicit summary judgments of sanction severity, where respondents must take into account all of the relevant perceived formal and informal consequences of offending. In the fear of crime literature, for example, such summary judgments of severity have been elicited using questions such as "to what extent do you think the experience of a typical instance of each of the following would affect your everyday life?" (see Jackson, 2011: 524). Grasmick and Bryjak (1980: 480) documented the advantages of using similar questions to measure perceived sanction severity. We believe such measures of severity have considerable potential for deterrence research.

Our study is not without limitations. First, our measures of fear do not fully capture all the dimensions of arrest-related anxiety. Fear of apprehension is an umbrella construct encompassing anxieties about the various consequences of arrest (e.g., arrest stigma and commitment costs). In future work, researchers should measure fear in relation to each of these different consequences and evaluate how specific types of fear influence offending decisions. There is also a need for investigation of the independent effects of fear of apprehension and fear of offending-related *victimization* on criminal decision-making. There is evidence that cognitive judgments about the dangerousness of committing crimes are negatively related to offending (McCarthy and Hagan, 2005). Nevertheless, emotional reactions to perceived danger may exert even larger effects.

Second, we relied on a small number of hypothetical vignettes to measure situational risk, fear, and offending intentions. Hypothetical vignettes have several drawbacks (Exum and Bouffard, 2010). For example, the elicited intentions to offend may lack predictive validity, and the results may depend on the specific crimes included in the vignettes (Exum and Bouffard, 2010; Jacobs, 2010). Pogarsky (2004) and others (Kim and Hunter, 1993) have found strong evidence supporting the predictive validity of behavioral intentions. Furthermore, in our study, despite using three very different scenarios and crime types, the findings were highly consistent across all vignettes. Even still, additional studies are needed to explore whether similar findings are obtained using alternative methodologies.

Third, and related to this limitation, our approach to operationalizing situational fear assumes that state anticipatory affect—that is, momentary emotions experienced due to the prospect of future events (Baumgartner, Pieters, and Bagozzi, 2008)—can be measured in a survey by hypothetical scenarios. Findings from research on affective forecasting show that "people are skilled at predicting the valence of their future emotional reactions … [and] the specific kinds of emotional reactions they will have" (Wilson and Gilbert, 2003: 401). There is also considerable evidence supporting the use of surveys to

measure state as well as trait affect (Watson, Clark, and Tellegen, 1988). Additionally, situational fear can only deter offending to the extent that it is, in fact, felt before and in anticipation of committing a crime, albeit in reference to a specific criminal opportunity. Thus, the process of answering hypothetical scenarios in surveys is similar in many respects to the thought process that must play out in offenders' minds prior to offending for deterrence to occur. Nonetheless, additional studies are needed to attempt to replicate our analysis with alternative, perhaps lab-based (e.g., van Gelder et al., 2017), measures of situational fear.

As one anonymous reviewer observed, our measures of fear may also be sensitive to social desirability bias. Meta-analytic evidence has shown that the most important method for reducing socially desirable responding in surveys is to use self-administration (Tourangeau and Yan, 2007), especially computerized self-administration (Tourangeau, Conrad, and Couper, 2013). Accordingly, we used the approach in our study. Even still, future studies should be aimed at examining whether similar findings are obtained when using physiological indicators of fear, such as heart rate (van Gelder et al., 2017), which are not susceptible to social desirability bias.

Another limitation of our study is that we used a conventional sample—only 21 percent of respondents reported ever having been arrested. The question remains whether an offender sample would yield comparable findings. At the same time, the correlates of sanction perceptions appear to be similar among offender and nonoffender samples (see Pickett and Roche, 2016). Still, future work is needed to replicate our findings with active criminals. And, indeed, fear of apprehension may be a useful way forward in adjudicating the debate on the utility of general population versus offender samples in deterrence research (see Apel, 2013; Apel and Nagin, 2011; Pickett and Roche, 2016). Perhaps the general population can formulate similar *risk* estimates to offenders, but the intuition that there is something special about serial offenders is indeed correct and can be explained by the *fear* that these risk estimates elicit (Jacobs and Cherbonneau, 2017). Researchers have noted that some offenders seem to be almost fearless (Anderson, 1999; Brezina, Tekin, and Topalli, 2009; Jacobs, Topalli, and Wright, 2000). Serial offenders may be deeply desensitized to fear of apprehension—due to lack of ambiguity, perceived ability to cope, or biological factors—but apprehend risk like the general population. In short, the fear/risk distinction presents further challenges to understanding criminal decision-making but also several promising future research avenues.

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Appendix A. Descriptive Statistics

			Range	
Variable	**Mean**	**SD**	**Min**	**Max**
Situational offending intentions				
Insurance fraud	19.660	26.752	0	100
Drunk driving	15.972	25.203	0	100
Purchasing stolen device	23.496	29.791	0	100
Situational fear of apprehension				
Insurance fraud	5.166	1.782	1	7
Drunk driving	5.658	1.572	1	7
Purchasing stolen device	4.605	1.957	1	7
Situational perceived apprehension risk				
Insurance fraud	3.601	1.808	1	7
Drunk driving	4.476	1.803	1	7
Purchasing stolen device	3.695	1.863	1	7
Generalized criminal propensity	1.693	.912	1	6.667
Generalized fear of apprehension	5.650	1.338	1	7
Generalized perceived apprehension risk	4.752	1.375	1	7
Low self-control	2.385	.728	1	5
Prior offending	.174	.468	0	3.667
Prior arrest	.311	.687	0	3
Vicarious arrest	.528	.499	0	1
Male	.535	.499	0	1
White	.773	.419	0	1
Age	36.410	11.812	18	77
Education	3.068	1.250	1	5
N		965		

ABBREVIATIONS: Max = maximum; Min = minimum; SD = standard deviation

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1F. Female Respondents: Question Wording, Descriptive Statistics, and Factor Loadings for Generalized Perceived Apprehension Risk and Generalized Fear of Apprehension
Table S1M. Male Respondents: Question Wording, Descriptive Statistics, and Factor Loadings for Generalized Perceived Apprehension Risk and Generalized Fear of Apprehension
Table S2F. Female Respondents: Regression Models Predicting Generalized Fear of Arrest and Generalized Criminal Propensity ($N = 449$)
Table S2M. Male Respondents: Regression Models Predicting Generalized Fear of Arrest and Generalized Criminal Propensity ($N = 516$)
Table S3F. Female Respondents: Regression Models Predicting Situational Perceived Arrest Risk ($N = 449$)
Table S3M. Male Respondents: Regression Models Predicting Situational Perceived Arrest Risk ($N = 516$)
Table S4F. Female Respondents: Regression Models Predicting Situational Fear of Arrest Risk ($N = 449$)
Table S4M. Male Respondents: Regression Models Predicting Situational Fear of Arrest Risk ($N = 516$)
Table S5F. Female Respondents: Regression Models Predicting Situational Intentions to Offend ($N = 449$)
Table S5M. Male Respondents: Regression Models Predicting Situational Intentions to Offend ($N = 516$)