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Beyond Rational Choice: the Hot/Cool Perspective of Criminal Decision Making

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This paper proposes a general framework of criminal decision making that assumes both 'cool' cognition and 'hot' affect, i.e. feelings, to influence criminal choice. Drawing from judgment and decision making research and social psychology, the hot/cool perspective extends rational choice and deterrence theories by explaining how affect is likely to influence criminal decisions alongside cognitive considerations, such as the perceived costs and benefits of crime. It is shown how the hot/cool perspective offers a more realistic account of criminal decision making processes than existing decision models and approaches and also allows for the explanation of criminal behaviors that are difficult to explain in terms of rational choice.

Keywords: rational choice; deterrence; emotions; affect; criminal decision making; dual-process models

Introduction

Even though decision making models restricted to rational choice considerations have often been challenged as being limited and unrealistic in their portrayal of criminal decision processes (e.g. Akers & Sellers, 2009; De Haan & Vos, 2003), few satisfactory alternatives have so far been developed. References to the role of feelings are not uncommon in narrative and interpretative approaches (e.g. Athens, 2005, 1997; Katz, 1988; Wright & Decker, 1997, 1994), and in theories that conceive of affect as an enduring disposition (e.g. Agnew, 1992; Wikström, 2006), but rarely make it into choice models of offending. This article proposes an alternative account of criminal decision making based on dual-process theories in social psychology and related fields, such as behavioral economics and neuroscience. It draws from other fields of human decision making because, as Nagin (2007, p. 262) notes, "research on choice in problem domains that seemingly have little connection to crime provide the basis for making fundamental advances in our knowledge and understanding of crime." As will become clear, the proposed hot/cool perspective of criminal decision making does not argue against the idea of rationality, but offers a more complete explanation of criminal behavior by considering the influence of affect, i.e. feelings, *alongside* rational considerations, such as the perceived costs and benefits, and shows how they are related.

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On rationality and rational choice

Over time, many different meanings have been bestowed upon the term 'rationality'. Hammond, writes that "rationality remains a concept whose interpretation is susceptible to personal preference, idiosyncratic explication, and popular misunderstanding, and, therefore, has produced countless varieties of meaning. As a result, at the beginning of the twenty-first century, there is no universal agreement on what it means to be rational" (2007, p. xiii).

The meaning the term is generally given in criminological texts has its roots in decision theory and economics. In these disciplines it traditionally refers to individuals who maximize expected utility according to a prescribed set of mathematical axioms for balancing costs, benefits and preferences. According to Akers and Sellers (2009, p. 27), deterrence researchers in criminology began to refer to economic rational choice theory to expand the deterrence doctrine beyond legal punishment. The basic idea underlying classical deterrence theory is that crime is a deliberate choice that people make from a range of behavioral options. In this way, people make those choices that they perceive to be in their best interests (Henry, Lanier & Lanier, 2006).

In a seminal paper, Becker (1968) introduced economic rational choice theory to crime research and argued that crime, or better said, the choice to offend, should be examined using the same principles of cost-benefit analysis people use when selecting legal behaviors. According to Becker (1968), beyond punishment, the monetary or psychic gain from offending and other variables representing the willingness to offend should also be included in the analysis.

However, even though traditional rational choice-based theories may remain faithful to the utilitarian notion that individuals tend to behave in ways that maximize benefits and minimize cost, it is often acknowledged that they do not engage in elaborate assessments of all the pros and cons of various alternative courses of action. Instead, people exhibit 'bounded rationality' and tend to opt for a solution that is satisfactory instead of optimal (Simon, 1957). In other words, for decisions to be rational, extensive computing is not required. The minimal condition is some form of rudimentary cognitive processing of pros and cons. This idea stands at the basis of the rational choice perspective that was developed by Cornish and Clarke (1986). According to these authors (1986, p. 1) the starting point of their rational choice perspective "was an assumption that offenders seek to benefit themselves by their criminal behavior; that this involves the making of decisions and of choices, however rudimentary on occasion these processes might be; and that these processes exhibit a measure of rationality, albeit constrained by limits of time and ability and the availability of relevant information." Cornish and Clarke's rational choice perspective thus departs from the more traditional economic rational choice conceptions in that for decisions to be 'rational', utility maximization is not essential. Instead, it coincides with the view of Simon (1957) that the decision making behavior of individuals is characterized by bounded rationality (Cornish & Clarke, 2006).

While some rational choice notions assume decision making to be boundedly rational and others as unbounded, and while some assume rudimentary processing of pros and cons, whereas others may claim elaborate assessments, all notions of the concept in criminology agree that offending is a choice process in which individuals,

when faced with several possible courses of action, will reason their way towards the option they believe is most beneficial to them at a given moment. Furthermore, all rational choice-based models used in criminology are essentially cognitive, i.e. thinking-based, choice models that pay little or no regard the role of feelings in criminal decisions.[1]

The Role of Feelings in Criminal Decisions

In rational choice and deterrence models, feelings are seen as unrelated to the decision-making process. However, as Shover (1991, p. 103) argued: "Whereas the model criminal decision maker is never angry, desperate, or defiant, the moods of real-life decision makers can distort the criminal calculus severely and make offenders unconcerned about risk". Impulsive or 'spur of the moment' decisions that result in crime offer illustrative examples of how criminal decisions may actually be heavily infused with affect.

In a study on shoplifting, Cromwell, Parker and Mobley (2003) found that more than 20% of the interviewed offenders gave explanations that directly implicated their feelings (e.g. stress, thrill, impulsivity) as the primary motivation for their offending behavior. Many of the offenders who cited instrumental reasons (e.g. 'I didn't want to pay for the item') as their primary motivation, also reported secondary motivations that implicated their feelings. Similarly, De Haan and Vos (2003), write that impulsivity, release of tension and emotions were reported as equally important motivations by street robbers as getting the money. With respect to violent crime, references to the influence of emotions such as anger, shame, contempt, outrage and frustration in its onset and its continuation are abound in the literature (e.g. Athens, 2005, Collins, 2008; Tedeschi & Felson, 1994).

Besides stressing the role of feelings in criminal decisions, various studies also question the notion of a calculating offender, as assumed by rational choice-based accounts. Feeney (1986), for example, found that robbers frequently embarked upon their offenses seemingly without a plan and with an apparent lack of deliberation; over half of the robbers he interviewed said they did no planning at all, and over 60% said that before the robbery the idea of getting caught hadn't crossed their minds. Comparable findings are reported by Gill (2000), Shover and Honaker (1992), Tunnell (1990) and Wright and Decker (1997). Shover and Hochstetler (2002, p. 12) conclude that there is remarkable consistency in the results of studies: "Burglars, armed robbers and other street criminals are anything but the careful calculating actors sketched in classical criminological theory".

There is likely to be variation among different types of crime with respect to the extent to which feelings play a role. According to Shover and Hochstetler (2005), white-collar criminals operate more in conformity with the assumptions of rational choice theory than street offenders who operate in hedonistic contexts which cloud judgment and eschew rationality and long-range planning. In contrast, many white-collar workers live and work in worlds that promote and reward prudent behavior (Shover & Hochstetler, 2005). By implication, they should be more prone to commit their crimes after carefully weighing costs against benefits and, consequently, operate more in conformity with the assumptions of deterrence and rational choice. Yet, as Akers and Sellers (2009) note, this remains an untested assumption because empirical evidence as to how strictly rational the decision process for white-collar criminals

actually is and to what extent it is more rational than for other offenders, is lacking. Furthermore, white-collar crimes may also implicate feelings such as fear, thrill and excitement (Bouffard, Exum & Paternoster, 2000).

Considering the above, it seems plausible that extending models of criminal decision making by incorporating affect is likely to increase their explanatory scope. As noted by Ward and Nee (2009, p. 173), affect is often treated as separate from cognition, but there are strong reasons to believe that the role of affect is central to and inextricable from decision-making processes and it makes sense that this development is taken on board when studying offending.

The approach taken in this paper differs from most previous crime research that has alluded to the role of feelings. Instead of examining emotion as a relatively enduring state or taking a narrative or interpretative approach, it draws form recent social psychological and judgment and decision-making research, risky decision making in particular, to study the actual choice process and the principles guiding it.[2]

Cognitive and Affective Appraisals of Risk

Differentiating between cognitive and affective responses to risk is important because feelings operate according to a different logic than cognitive risk estimates. People have, for example, been found to dread certain risks more than others that are more likely to occur and/or are more severe in nature (e.g. Slovic, 1987). In these cases, feelings about risk are influenced by considerations orthogonal to its probability and severity, such as the extent to which it is controllable. The classic example in this respect is that most people experience little fear driving a car, yet dread flying even though acknowledging the fact that driving is much more hazardous than flying (Loewenstein, Weber, Hsee & Welch, 2001).

As will be argued in more detail later in this article, the divergence of cognitive appraisals from emotional reactions can occur because the latter have determinants that differ from those that drive cognitive evaluations. Emotions respond differently to probabilities and outcomes, the two central input variables of rational choice and deterrence models, than cognitive evaluations of riskiness (see Loewenstein et al., 2001). As Frijda (1988, p. 355) notes "emotions know no probabilities. They do not weigh likelihoods. What they know, they know for sure." Emotions *are*, however, influenced by variables that play only a minor role in cognitive evaluations, such as the time interval between the decision and the realization of outcomes, and the degree to which a risk is known or controllable (Loewenstein et al., 2001).

Emotions, moods and visceral drive states

Besides distinguishing affect from cognition, it is also important to differentiate between different types of affect. Affect is a general term that refers to the experience of feelings, which encompasses moods and emotions, and may extend to visceral drive states, such as pain, drug craving and sexual arousal. Moods and emotions, even though closely related, are distinct phenomena. Moods are low-intensity, diffuse (i.e. unfocused), and relatively enduring affective states without a clear antecedent cause (e.g. feeling good or feeling bad) (Forgas, 1995, p. 41). Compared to moods,

emotions are more intense, focused, and short-lived and usually have a definite cause (e.g. being angry at, or fearful of, something) (Forgas, 1995, p. 41).

Various experimental studies have documented the influence moods can have on unrelated judgments. Johnson and Tversky (1983), for example, showed that people who were induced to experience positive affect tended to make more optimistic risk estimates than people who were made to experience negative affect. Additionally, individuals in anxious moods are likely to evaluate risks as more threatening and severe in comparison to individuals who feel elated (Schwarz & Clore, 1988). Furthermore, individuals may use their mood as a source of information about their own state (Schwarz & Clore, 1983). It is therefore a plausible, yet untested, assumption that mood serves as an important cue for judgment related to certain offenses. Happy or elated moods may lead people to underestimate risks and engage in reckless activities, such as speeding or unwanted sexual overtures. Anxious moods do the reverse and prompt cautious behavior.

The potential effect of mood on crime also operates in a different way. According to Shover and Honaker (1992), crime provides an offender the opportunity to establish himself as a competent individual and (re)gain a sense of control over his life. Offenders may consequently try to alleviate a negative mood, such as feelings of frustration born out of failure at legitimate activities, through crime (Wright & Decker, 1994). The link between negative mood alleviation and risky behavior is supported by experimental research. Leith and Baumeister (1996) found that people's negative moods were related to lower self-control, which in turn led to riskier behavior. They explain this finding by arguing that "[p]eople who are upset seem merely to seek out the best possible outcome and grab for it, without being deterred by rational cost-benefit calculations or even by the prospect of possible unpleasant consequences" (Leith & Baumeister, 1996, p. 1264).

Different from moods, emotions have a definite antecedent cause and are associated with an evaluative judgment, or *appraisal,* of an event and its significance for our well-being. Emotions, therefore, carry information about ourselves and the state of the world around us. An appraisal triggers certain specific tendencies to respond to the eliciting stimuli (Frijda, 2007, 1988; Smith & Ellsworth, 1985, 2003). Angry individuals, for example, are likely to assess a situation as more controllable and certain and, consequently, perceive it as less risky than fearful individuals do (see e.g. Lerner & Keltner, 2000, 2001; Smith & Ellsworth, 1985). Anger, consequently, can facilitate criminal action, while fear is likely to inhibit it. Furthermore, emotions can influence the quality and depth of information processing of decision outcomes and the prediction of consequences (e.g. Loewenstein & Lerner, 2003).

Because emotions are adaptive responses to the environment geared to help individuals respond to the challenges facing them (Frijda, 1986, 1988; Smith & Ellsworth, 1985; Ellsworth & Scherer, 2003), they can also assist in making the right choices rather than just interfering with sound decision making (Damasio, 1994). In a sense, emotions save cognitive processing by triggering time-tested responses to universal problems such as loss, threat or injustice (Loewenstein & Lerner, 2003, p. 628). Indeed, as Ward and Nee (2009, p. 174) note, research on the role of emotion on judgment suggests that it can have both positive and disruptive effects as a lack of emotional competence can also mean that individuals struggle to deal adaptively with their problems.

Anticipated versus immediate affect

Besides distinguishing moods from emotions it is essential to differentiate between the various ways in which affect can influence decision processes. One fundamental distinction is that between *anticipated,* i.e. post-decision, and *immediate* affect.[3] The former is a component of the anticipated consequences of a decision and refers to emotions *expected* to occur when outcomes are experienced, such as regret, disappointment or feelings of shame, rather than emotions experienced at the time of decision. Immediate affect, on the other hand, is experienced at the time of decision. It can arise from contemplating consequences, such as feelings of fear and dread when visualizing potential negative outcomes, so-called *anticipatory* emotions, or it can be the result of incidental influences unrelated to the decision itself, such as the mood of an individual at the moment of decision making. In the latter case we can speak of *concurrent* or *incidental* immediate affect.

Various studies of decision making have shown that people are motivated to avoid feeling regret and disappointment and therefore opt for courses of action that minimize the likelihood of these emotions occurring (e.g. Bell, 1985; Mellers, Schwarz, Ho & Ritov, 1999). When affect is considered in rational choice and deterrence models, it concerns this type of post-decision emotions, (e.g. Bachman, Paternoster & Ward, 1992; Nagin & Paternoster, 1993; Piquero & Tibbetts, 1996). For example, when presented with an opportunity to steel, an individual might refrain from thievery thinking, "If I steel this now, I'll regret it later". The desire to avoid feeling regret functions as a deterrent to performing such action. A similar point applies to the "sneaky thrills" that are expected to result from minor property crime (see Katz, 1988), which also refers to anticipated consequences of conduct, and not emotions experienced at the moment of the decision itself (Bouffard, 2002).

Even though anticipated affect can be and has been incorporated in rational choice-based models, the decision process remains modeled as the implicitly cognitive task of predicting future emotions and weighing them in terms of the expected utility of the different possible courses of action (Loewenstein et al., 2001). In other words, as far as rational choice and deterrence models have addressed the role of emotions, they have done so to a limited extent because the influence of immediate affect has been disregarded.

Furthermore, note the fundamentally different nature of anticipated emotions that have been associated with offending compared to anticipatory emotions and moods likely to influence it. Regret, guilt and shame share a certain moral character (Frijda, 1986; Marshall, Marshall, Serran, & O'Brien, 2009; Tangney, Baumeister & Boone, 2004), that anticipatory emotions (e.g. fear, anger) lack. Additionally, they do not occur without a social context. Instead are self-conscious and directly involve (self-)reflection and evaluation (Tangney, 2003). Anticipatory emotions can have a social source, but this is not necessary. We can be angry at the policeman that gave us a fine, but also because our flight is delayed.

As mentioned earlier, immediate affect can regard emotions which arise from contemplating the consequences of a decision, i.e. be *anticipatory* in nature, or they can be incidental and therefore unrelated to the decision at hand, such as the mood of an individual, i.e. be *concurrent*. The distinction between anticipatory and concurrent affect may turn out relevant for criminologists because certain criminal actions cannot be realistically represented as one-off discrete choices between

alternatives, but seem to be the outcome of a sequence of events in which offenders flow from one situation into the next. Wright and Decker (1994, p. 60), for example, note that "[c]rime often appears to happen almost automatically, the crime occurring with minimal calculation as part of a more general path of action''. This implies that an offender's affective state at one moment is likely to influence his/her actions in a subsequent one. Note that rational choice-based accounts, which model crimes as individual cases of discrete choice, have trouble not only accommodating the influence of feelings triggered by a specific situation, but also feelings that are unrelated to the decision at hand.

Modeling Cognition and Affect: The Dual-Process Hypothesis

The idea that affective reactions can take place virtually independent of cognitive input, led Zajonc (1980, p. 151) to conclude that "affect and cognition are under the control of separate and partially independent systems that can influence each other in a variety of ways, and that both constitute independent sources of effects in information processing.'' The notion of two different and partially independent systems of information processing stands at the basis of dual-process and -system theories, which have become common currency in social psychology, social cognition in particular, and are also common in other fields that study human decision making, such as behavioral economics and neuroscience.

Dual-process theories revolve around the idea that when people engage in activities as diverse as making attributions, solving problems, evaluating risks, or deciding on a certain course of action, two qualitatively different modes of mental processing are simultaneously operative (e.g. Chaiken & Trope, 1999; Kahneman, 2003; Van Gelder, De Vries & Van der Pligt, 2009). Whereas dual-process models tend to describe two modes information processing in a specific domain, dual-system models posit two mental systems that guide behavior in general, each operating according to different principles (e.g. Metcalfe & Mischel, 1999; Sloman, 1996; Strack & Deutsch, 2004).

The various duality models that have been proposed differ somewhat in content and also in terms of terminology. Some pit a controlled (or rule-based) against an automatic (or associative) mode (e.g. Sloman, 1996; Smith & DeCoster, 2000), while others refer to the distinction as reflective versus impulsive (e.g. Strack & Deutsch, 2004). Still others make a more direct reference to the fact that one of the modes is essentially cognitive in character, whereas the other is affect-based (e.g. Chaiken & Trope, 1999; Epstein, 1994; Hsee & Rottenstreich, 2004; Loewenstein & O'Donoghue, 2004; Metcalfe & Mischel, 1999; Mukherjee, 2010; Van Gelder et al., 2009; Van Gelder & De Vries, 2012). Metcalfe and Mischel (1999), for example, differentiate between an emotional 'hot' system, which is under stimulus control, and a cognitive 'cool' system, which is the seat of self-control.

In spite of differences between the various models, a significant number of them shares a set of common assumptions (Smith & DeCoster, 2000). The most distinguishing characteristic of all models is that behavior, instead of being the result of mere calculation, habit, drive or motivation, is guided by more than one underlying process (Strack & Deutsch, 2004).[4] Furthermore, one of the modes of processing -the hot, affective, impulsive or heuristic, mode- is fast, requires little or no cognitive effort, employs heuristic judgments, and has a low threshold for

processing incoming information. The opposite holds for the other –cool, cognitive, rule-based, systematic- mode of processing, which is associated with effortful, systematic judgments and decisions based on extensive thinking. While processing in the former mode is not necessarily conscious, it is in the latter which also allows for abstract and hypothetical reasoning (Evans, 2003). Additionally, while the cool, cognitive mode is controlled and volitional, influences from the hot, affective mode are automatic in nature and can be hard to suppress. Finally, both modes influence decision making behavior to varying degrees, depending not only on the nature of decision outcomes and the way a situation is framed but also on individual differences (Mukherjee, 2010). Van Gelder and De Vries (2012), for example, found personality traits to relate differentially to the cognitive characteristics perceived sanction severity and probability and the negative affect that was evoked by the prospect.

The notion of two systems that guide information processing and behavior lends itself well for studying and describing criminal decision making and, as will become clear, allows for the explanation of crimes that are hard to accommodate by strictly cognitive perspectives. Below, we take the dual-process notion as the basis for developing a hot/cool perspective of criminal decision making drawing mainly from models that adhere to the cognitive/affective distinction which, it should be noted, does not necessarily map perfectly onto all the other dual-process models that have been suggested.

A Hot/Cool Perspective of Criminal Decision Making

The central explanatory element of the hot/cool perspective of criminal decision making regards the potential discrepancy between cognitive appraisals of a criminogenic situation and affective reactions to it, which is the result of two qualitatively distinct modes of mental processing that guide behavior. The cool, cognitive, mode is sensitive to considerations such as probabilities and extralegal costs such as anticipated guilt and social disapproval, and is therefore likely to respond to notions of sanction severity and certainty, as suggested by deterrence theorists. The cool mode is also responsible for weighing costs against benefits and making projections about the long-term consequences of decisions and, consequently, functions much in accordance with the logic assumed by rational choice models of offending.

The hot mode, however evaluates in a more intuitive way and responds to different situational characteristics, such as the temporal and spatial immediacy of decision outcomes, their controllability, and the vividness with which they can be imagined, but remains largely unresponsive to probabilities and outcomes themselves. Loewenstein and O'Donoghue (2004), for example, note that as an uncertain averse event approaches in time, people's fear tends to increase even when the probability or severity remains constant. Rather than self-regulating like the cool mode, the hot mode's operation is triggered by external stimuli. It is under stimulus control and therefore largely non-volitional in nature. The fact that the hot mode is insensitive to the input variables of rational choice models explains why an individual's (criminal) behavior can deviate from or, as will be shown later, even directly contradict what would be a beneficial course of action in terms of perceived utility and long-term considerations.

Beyond rational choice

The idea of two separate modes of mental processing that guide behavior can elucidate a number of fundamental issues pertaining to criminal decision making that existing theories have not been able to satisfactorily address. For one thing, it shows why anticipated emotions such as regret and shame can be incorporated in rational choice models, but immediate affect, such as anger and fear or negative moods, cannot. As predictions about future emotional states, regret and shame are essentially costs that are incorporated in the cognitive calculus. In terms of the dual process approach, the consideration of potential future regret, guilt and shame, like estimates of probability and severity, belong to the domain of the cool, cognitive, mode as they, at the time of decision, primarily regard *thoughts about feelings* rather than feelings themselves.

Direct visceral reactions to risk, such as anger, fear and sexual arousal, on the other hand, implicate the hot mode and are difficult, if not impossible, to plausibly model as costs or benefits; they are simply there. This is perhaps best evidenced by the many affective processes that occur below the level of our awareness and that are hence not consciously experienced (LeDoux, 1996). In a similar vein, Loewenstein and O'Donoghue (2004) give the example that people can become fear conditioned to subliminal stimuli which, they argue, may actually be powerful precisely because the conscious, cool system is unaware of them and is therefore less likely to engage in efforts to override it. Additionally, even if an actor is aware of the influence of affect on his/her behavior, it may still only be partially subject to cognitive control. For instance, the cool system may be perfectly aware that it makes no sense to take out frustrations from work on one's spouse; but if the negative feelings generated at work carry over into the home, such cognitive awareness may make little difference (Loewenstein & Lerner 2003). In short, as these immediate emotions fall outside the explanatory scope of a cost-benefit analysis, however extensive this analysis may be, while exerting an influence on (criminal) behavior, a major limitation of strictly cognitive decision making models emerges.

Note again that the hot/cool perspective does not assume that rational, i.e. cognitive, considerations do not play a role in decisions to offend. Instead it argues that feelings play an important role in determining criminal choice behavior *alongside* these considerations and that it is important to consider both. The hot/cool perspective assumes behavior to (generally) be the result of both cognitive and affective processes, in which the latter can influence for former and vice versa. The cool mode influences the decisions of the hot mode by exerting restraint or self-control, whereas the hot mode influences the cool mode for example by alerting it that something needs our attention. Many environmental stimuli will activate both the hot and the cool mode and the resulting 'bilateral' influences are mutually reinforcing such as when the sight of food activates the affective state of hunger and the cognition "What shall I cook for dinner tonight?" (Loewenstein & O'Donoghue, 2004).

Most behavior therefore results from an interaction between the cool mode and the hot mode. Evidence for this interaction comes from neuroscience as neural pathways run both from the more primitive brain sections associated with hot affective processing, such as the limbic system and the amygdala, to the prefrontal cortex, which is responsible for cool deliberative processing, and vice versa (LeDoux,

1996, 2003). However, the hard-wiring of the brain allows for an emotional reaction without the participation of a cognitive appraisal, though not the other way around (LeDoux, 1996; Zajonc, 1998, 1980). This means that if the cool system is not activated, behavior is entirely driven by the hot system and affective motivations (LeDoux, 1996; Loewenstein & O'Donoghue, 2004; Zajonc, 1980). This explains that in situations that trigger strong affect, for instance situations giving rise to impulsive crimes of passion or road rage, offenders may not weigh the pros and cons of alternative courses of action at all.

Competition for Control

Due to their parallel operations, the two systems can compete for the control of overt responses. For example, when the hedonic properties of immediate and long-term consequences are negatively correlated, which is often the case with crime, the hot system will cue a different behavioral response than the cool system (Pham, 2007). The cool system may, for example, try to prevent the execution of a behavior that was impulsively activated by the hot system. In other words, this potential divergence in responses explains why we can think about something one way, e.g. "I really shouldn't do it because it is too risky", but feel about it differently, e.g. "I really want it, so I'll just take my chances". In addition, the fact that the hot mode is under stimulus control and therefore non-volitional in nature explains why offenders may report having little control over their criminal behavior (cf. Katz, 1988).

In short, if the cool system is unable to override the (antagonistic) response of the hot system, the latter dominates and impulsive behavior ensues. Therefore, if the triggered response of the hot system is intense enough, it leads to lapses in self-control, which has been found to be an important correlate of crime, and its defining element according to some (e.g. Gottfredson & Hirschi, 1990). The assumption is that lapses in self-control occur when the hot system temporarily takes over which leads behavior to be determined by the immediate associations generated by stimuli and their hedonic properties, rather than the assessed valence and probability of future consequences. Note that this implies that individual differences in the ability to exert self-control are at least partially rooted in the strength of the cool and hot modes (see Van Gelder & De Vries, 2012).

Time-Perspective

Another, related, insight of the hot/cool framework is the difference in time-orientation of the two systems, and their (in)ability to envisage future events. The cool mode can mentally represent future events and generate a time perspective, which allows for an understanding and evaluation of different alternative courses of action and developments over time. As the cool system can take into account both short-term and long-term payoffs, it enables individuals to resist immediate rewards and strive for more valuable future outcomes.

As was mentioned before, the hot system is stimulus-oriented and triggered by perceptual input, and its time horizon is restricted to the immediate present. The hot mode is, consequently, set in motion by external stimuli, tied to the here-and-now and relatively (long-term) goal independent. It lacks the capacity to represent the future and consequently the ability to evaluate the hypothetical consequences of

behavior, such as the legal or social sanctions that may follow a crime. When a behavioral response is generated by the hot system, it may therefore appear reckless and impulsive. This sheds light on the finding that people who commit crimes often engage in action that even though offering immediate rewards, simultaneously entail the risk of long-term costs greatly exceeding the benefits (Hirschi, 2004). Because affective rules of valuation are geared to the here-and-now, it is not difficult to see how this can lead to impulsive and self-defeating behavior in domains where present and long-term hedonic consequences are negatively correlated.[5] Or, in the words of Bouffard et al. (2000), while the benefits of self-destructive conduct are generally immediate, its costs are more remote.

In sum, in situations where intense emotions are at stake, decision behavior is likely to violate the assumptions of rational choice and other strictly cognitive models of decision making in different ways. The inability of the cool system to correct a self-defeating response of the hot system explains the finding that people may act in ways that run counter to their best interest. The shortening of one's time horizon under the influence of emotional arousal in which short term benefits are weighed disproportionately in comparison to long-term considerations also contradicts rational choice theory, as the costs of the action may fully outweigh the (long-term) benefits and individuals fail to make informed trade-offs, or don't succeed to act on them.

To sum up, the hot/cool perspective can explain why an individual may be perfectly able to make informed trade-offs between immediate benefits and delayed costs of behaviour in one, emotionally-neutral, situation, but fails to do so in a subsequent one that is affect-laden. Inconsistency in preferences over time, or even their reversal, leads to behaviour that is seemingly 'irrational', but cognitive decision making models have to stop short of identifying the conditions that brought these inconsistencies about and why they occur, while they make perfect 'sense' from a hot/cool perspective.

Intense Arousal and Influence of Affective Drive States

LeDoux (1996) notes that emotions can flood consciousness because the hardwiring of the brain is such that connections from the emotional systems to the cognitive systems are stronger than vice versa. Intense emotions may therefore overwhelm cognitive processing and deliberative decision making (Loewenstein & Lerner, 2003). This influence can be so pervasive that people can act against their self-interest even in full knowledge they are doing so (Loewenstein, 1996).

This conflict between emotional impulse, the hot mode, and reasoned cognition, the cool mode, and the former overriding the behavioral response of the latter explains why individuals can become unruly and impulsive when experiencing strong emotions, which may result in criminal behavior. Expressive violence forms an apt illustration of this process. Baumeister and Heatherton (1996) note that violence typically results when someone becomes angry at a pressing stimulus. The anger, which implicates the hot mode, keeps attention confined to the immediate, provoking situation and so efforts to restrain violent impulses and consider the long-term, i.e. a corrective response by the cool mode, becomes difficult. Mischel, Cantor and Feldman (1996), for example, observe that physically abusive men typically are intensely invested in their intimate relationships. Following a violent outburst, it is

common for them to beg their partner for forgiveness and, in extreme cases, go so far as to threaten with suicide in case the partner intends to leave them. In other words, these men's repetitive violent outbursts are clearly self-defeating (Mischel, Cantor and Feldman, 1996).

In a similar vein, Collins (2008) relates about crimes that follow prolonged periods of built up tension, such as police officers that severely beat up their victims after high-speed chases and atrocities of soldiers committed against civilians. These crimes are committed in an emotional rush that seems unstoppable and uncontrollable. After the outburst follows the realization that the behavior was excessive: "It is like an altered state of consciousness, from which the perpetrators often emerge at the end as if returning from an alien self" (Collins, 2008, p. 100).

Findings from research into the influence of intense affect on behavior also apply to visceral drive states such as drug craving (Loewenstein, 1996). A drug addict, for example, when relapsing into addiction knows that "taking the drug is the wrong course of action, but is unable to translate this belief into action" (Loewenstein, 1996, p. 272). Indeed, there is no dearth of evidence that many crimes, such as robberies, burglaries and other types of street crime, are drug-related, either committed under the influence of drugs and/or with the goal of obtaining drugs (e.g. Cromwell et al., 2003; Gill, 2000; Shover & Honaker, 1992; Wright & Decker, 1994, 1997).

Sexual arousal is another example of an affective state that exerts a strong influence on behavior and that may result in criminal behavior (Bouffard, 2002; Loewenstein, Nagin & Paternoster, 1997; Ariely & Loewenstein 2006). In an experimental study using a date rape scenario, Loewenstein et al. (1997) found that sexually aroused participants were more likely to imagine that they would behave in a sexually forcefully manner on a date than did non-aroused participants. The effect of arousal on predicted behavior was not mediated by a wide range of cost and benefit variables. Arousal, therefore, not only influenced the way costs and benefits were processed, but also exerted a *direct effect* on behavior. This finding is consistent with the assumption of the hot/cool perspective that affect and cognition pertain to separate paths of mental processing that influence behavior, and that feelings not only influence behavior indirectly, but can also exert a direct effect on behavior.

Failure to Acknowledge the Influence of Affect on Behavior: Implications for practice

An important characteristic of affect and other drive states is that people are often oblivious of their influence. More specifically, individuals in an emotionally neutral, or 'cold', state tend to systematically underestimate the effect intense affect, the 'hot' state, can have on their future behavior and preferences, and the influence it has had on their past behavior (Loewenstein, 1996). The inability of individuals to appreciate the motivational force of affect on their behavior can lead them to overestimate their capacity to control temptation (Loewenstein, 2005; Nordgren, Van der Pligt & Van Harreveld, 2009). These findings have important implications for practice.

A failure to acknowledge the influence of affect on previous behavior and unrealistic optimism regarding one's ability to control impulses in future situations, may imply that convicted offenders fail to optimally utilize their possibilities to protect themselves against the temptations of crime and may return to situations that

contributed to their initial offenses, even if they are committed to abstain from offending (Dhami et al., 2006). In other words, for crimes committed in states of intense arousal, not only is (anticipated) punishment less likely to achieve the desired deterrent effects, even offenders motivated to abstain from criminal behavior are likely to underestimate the influence their feelings have on their behavior. Therefore, they may fail to take the necessary measures to avoid certain situations or deal with intense affective states when these emerge. In a similar vein, for treatment to be successful, it may be crucial to strengthen the offender's awareness of the processes in the onset of negative affect (Day, 2009). Indeed, Howells and Day (2006) have argued that successfully engaging in treatment requires (violent) offenders to experience and accurately label their emotional states (see also: Howells, Day & Wright, 2004).[6]

This implies that impulsive or hot (state) crimes may require a fundamentally different response from the criminal justice system to prevent offenders from re-offending, than cognitive, calculated offenses. For offenders motivated to abstain from future offending, it is more useful to create awareness of the influence of affect and people's inability to resist impulses, rather than placing faith in the unlikely assumption that in the future, after punishment, adequate cost-benefit calculations will be made in similar situations. If people are made aware of how their decisions are being influenced by their own affective state, they could (be trained to) compensate for such influences, which requires the cool mode to inhibit the response cued by the hot mode. Indeed cognitive behavioral interventions often promote emotional regulation skills through effortful overriding impulsive and automatic response tendencies (Mischel, 2004). Relatedly, anger management programs generally attempt to increase inhibitory processes and control angry responses (Davey, Day & Howells, 2005).

To take the example of anger, Davey et al. (2005) note that 'reappraisal' of an anger-inducing event is a cognitive strategy of re-construing it in less hostile terms such that the anger is not experienced. In this case the reinterpretation of the event will avoid triggering a strong response from the hot mode by changing the meaning of the eliciting event and hence the appraisal tendencies associated with anger. An alternative strategy is suppression of the anger (e.g. biting one's lip) to inhibit angry behavior (Davey et al., 2005). Here the idea is to directly suppress the response of the hot mode instead of attempting to avoid its activation. Both strategies are compatible with the hot/cool perspective laid out in this article. Whereas emotion regulation regards inhibiting the hot mode, thinking in more logical and objective ways implies strengthening the cool mode. In sum, self-regulatory competencies and 'cooling' strategies can help enable crime prone individuals to overcome diverse momentary 'hot' situational pressures and prevent impulsive responding (e.g., LeDoux, 1996; Loewenstein & O'Donoghue, 2004; Metcalfe & Mischel, 1999). In spite of the fact that many offender treatment programs are sensitive to the influence of emotions on offending behavior, others are still based on the assumption that offenders make essentially rational choices about their offending (Day, 2009, p. 119; Ward, 1999).

Discussion & Conclusion

Earlier work on emotions and offending has remained largely confined to narrative or interpretative approaches or addressed affect as an enduring individual disposition. Studies relying on self-reports by offenders are highly informative for our

understanding of crime but are unlikely to give full insight into the mechanisms of affect influencing choice as people are often not even aware of this influence, not to mention other problems associated with recall and self-report methods. Theories that address the role of affect as an enduring characteristic tell us a lot about stable differences in individual disposition but are not able shed light on the actual choice process. Previous studies have therefore been somewhat restricted in their ability to explain this behavior and give little insight into the psychological states of offenders.

This paper introduced an alternative perspective that extends the dominant choice paradigms in criminology. By drawing from other fields of human decision making such as social psychology, behavioral economics and neuroscience, an alternative framework that is able to incorporate the rational choice and deterrence perspectives and address the role of emotions and their interactions was developed. It was shown that this hot/cool perspective is able to explain delinquent behaviors that cannot be accommodated in terms of rational choices and provides a more realistic account of the criminal decision process.

The hot/cool approach illuminates why notions such as sanction severity and celerity often have little or no effect on crime rates and why the effect of punishment certainty is only modest (see Nagin, 1998). As was argued in the article, feelings about risk are largely insensitive to changes in probability and (severity of) outcomes or social costs, implying that deterrence is unlikely to be effective when transgressions are intimately associated with affect. In these cases, short-term considerations outweigh or obscure long-term consequences in the mind of the offender as the influence of affect ties his/her focus to the immediate present, and as such encourage making the (criminal) choice that yields immediate benefit. Even in cases in which individuals display a general motivation to abstain from offending, the only thing required to (re-)offend may be a 'weak moment' and rational considerations to be temporarily overridden by affects' desires.

Ironically, while absent in contemporary choice models of criminal decision making, the distinction between hot affect and cool cognition is not alien to our criminal justice systems and has had implications for the way crimes are punished. The classic distinction is that between premeditated and impulsive crime, which implies that hot-blooded crimes of passion resulting in death are viewed as fundamentally different from, and therefore deservant of less harsh punishment, than cold-blooded murder. For the criminal justice system to classify an intentional killing as voluntary manslaughter, instead of murder, what is required is a reasonable provocation, that a reasonable person so provoked would not have cooled off in the time interval between the provocation and the delivery of the fatal blow, and that the defendant must not in fact have cooled off during that interval (LaFave & Scott, 1986, p. 654, cited in Bushman & Anderson, 2001). The parallels with the hot/cool perspective are striking. The first condition refers to an external stimulus eliciting the behavior (recall the hot mode being non-volitional and under stimulus control), whereas the second and third conditions refer to the (in)ability of the cool system to inhibit the response cued by the hot system. In other words, the idea that emotional arousal can inhibit rational thinking and the ability to act willfully, has been intuitively grasped and accepted by our criminal justice systems.

The hot/cool perspective of criminal decision making implies a significant advance over rational choice and deterrence models as it offers a more complete and more accurate explanation of criminal choice behavior. It is able to explain many

types of crime and how people actually go about making criminal choices without having to resort to artificial or farfetched constructions that force classification on a rational-versus irrational continuum.

Nevertheless, the hot/cool perspective is still general in nature and requires empirical testing. Finding out how the two systems actually interact with respect to different situations, personality types, and kinds of crime is the next big empirical challenge for research in criminal decision making. While much work within social psychology, neuroscience and behavioural economics supports the dual process idea for different domains of human behaviour, it still requires testing in research on crime and delinquency. Criminal behavior cannot simply be equated with risky behavior in other domains if only because the former contains a strong moral dimension that the latter lacks and crimes vary in terms of the degree to which they implicate risk. Furthermore, the fact that criminal acts carry significant consequences for others, e.g. victims, implies they are related to individual differences in empathy, which is often not the case in other behavioral domains. It is interesting to remark here that empathy too has both a cognitive and an affective component, the former expressed in individuals' ability to recognize and understand the feelings of others and the latter in the ability to actually experience these feelings imaginatively. Future research should therefore focus on individual differences in the ability to which people are susceptible to be led by their feelings. This begs the question as to what extent volitional processes in the cool mode can actually be used to inhibit or channel impulses from a hot mode that seeks immediate satisfaction, and whether, and to what extent, people can be trained to compensate for influences of their hot mode. Hopefully, the hot/cool perspective can function as a point of departure for research that addresses these and other issues.

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Notes

1. Situational theories such as situational crime prevention (Clarke, 1997) and routine activities theory (Cohen & Felson, 1979; Felson, 2002), are also situational perspectives premised on the notion of a reasoning or rational offender who engages in a cost-benefit analysis when making his decision to engage in crime or not. In other words, these are also rational choice-based approaches to crime.
2. Nagin and Pogarsky (2001, p. 885) note that "in decision making parlance, the criminal opportunity presents a choice between a sure thing (restraint from the criminal act), and a gamble that arises because the contemplated conduct can produce a gain with some probability and a loss with complementary probability." In other words, a criminal decision is a kind of risky decision.
3. The distinction between anticipatory and immediate affect presented in this section is largely drawn from Loewenstein et al. (2001) and Loewenstein and Lerner (2003).
4. Gilbert (1999) notes that because there are no tangible referents for the processes as specified in dual-process models, there is generally no proper way to count them and rule out the possibility that there may in fact be more than two processes. It is however clear to most psychologists that there is more than one (Gilbert, 1999). Deutsch and Strack (2006) add that the assumption that there are exactly two processes is not implied by duality

theories. Systems are regularly interacting groups of processes that share the same computations or functions. Accordingly, the two systems entail multiple processes.

5. It could be argued that the tendency to let short-term benefits prevail over long term costs can be brought under the explanatory scope of strictly cognitive models through the notion of hyperbolic time discounting, i.e. the finding that people care more about the same time delay if it occurs earlier than if it occurs at a later time. In other words, the value of a later reward is discounted by a factor that increases with the length of the delay. That is, even though people normally choose options that give substantial weight to long-term costs and benefits, when making decisions with immediate consequences, they will tend to be place disproportionate weight on immediate costs and benefits. However, Loewenstein and Lerner (2003) note that hyperbolic discounting has significant limitations as an explanation for impulsivity for two reasons. First, it does not explain why people display impulsive behavior in certain situations (e.g. when they are hungry, sexually aroused, angry or frightened) but not in others. Thus, the hyperbolic discounting perspective has difficulty accounting for situation- and reward-specific variations in impulsivity. Second, hyperbolic discounting cannot explain why many situational features other than time, such as physical proximity and sensory contact with the desired object commonly lead to impulsive behavior (Loewenstein & Lerner, 2003, p. 625).
6. Note that this points towards individuals differences in the strength of the hot and the cool mode in individuals.

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