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RESEARCH ARTICLE

NUDGING & CHOICE IN OFFENDING DECISIONS

Nudging and the choice architecture of offending decisions

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Research Summary: Deterring crime is often considered to be a process of information transmission (e.g., Geerken & Gove, 1975). Economic notions on incentives and choice have meshed well with this perspective (Becker, 1968; Matsueda, 2013). Behavioral economics, however, represents a source of further insights on offender decision-making, particularly regarding information transmission to promote conformity. Pogarsky, Roche, and Pickett (2018) reviewed behavioral economic studies of offender decision-making in criminology. In their review, they focused on prospect theory (Kahneman & Tversky, 1979), a behavioral economic model of decision-making. More recently, Kahneman (2003, 2011) highlighted the dual-process nature of behavioral economics, and Thaler and Sunstein (2009) elaborated some principles of nudging. These notions underscore dimensions of offending decisions beyond the perceived costs, risks, and benefits of crime.

Policy Implications: From a behavioral economic standpoint, there is a choice architecture to offending decisions that permits various prosocial nudges. We analyze these ideas for possible theoretical innovations and alternative perspectives on crime policy.

KEYWORDS
behavioral economics, decision-making, deterrence, dual process, nudge

Beginning in the late 1950s, rates of drug, property, and violent crime increased precipitously until the great crime drop of the early 1990s. These increases coincided with the permissive social and legal climate of the 1960s and the U.S. Supreme Court's expansion of criminal defendants' rights under Chief

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Justice Earl Warren.[1] During this time, Becker (1968) initiated a period of sustained economic thinking about crime research and policy. The view took hold that crime increased because it became steadily less risky and costly for potential offenders. The policy response entailed increasingly punitive crime control beginning in the 1990s, a period often termed *mass incarceration*. The linkage to economics was clear. Becker (1995, p. 6) declared "prison works and, barring any more effective methods, is useful." To disincentivize and reduce crime, Becker (1995, p. 9) advocated for "law-and-order-type policies" like sentence enhancements, stop-and-frisk, more prisons, and three-strike policies.

Ensuing policy initiatives mostly aligned with these recommendations, but now there is widespread consensus for a less monolithic approach that better comports with recent research findings on criminal deterrence and human decision-making. Criminology lacks consensus on the empirical status of deterrence principles (e.g., Chalfin & McCrary, 2017; Loughran, Paternoster, Chalfin, & Wilson, 2016; Pratt, Cullen, Blevins, Daigle, & Madensen, 2006; Tonry, 2008). There is also conflicting evidence on key contingencies for deterrence. For example, some researchers have found that criminal propensity diminishes (e.g., Nagin & Paternoster, 1993; Piquero & Tibbetts 1996), whereas others have found that propensity enhances (Pogarsky, 2007; Tittle, Ward, & Grasmick, 2004; Wright, Caspi, Moffitt, & Paternoster, 2004), legal deterrent effects.

Thus, receptiveness to new perspectives has grown. In one such perspective, *behavioral economics*, the signature "rational actor" assumption of economic theory is relaxed (Dhami, 2016; Kahneman, 2011; Thaler & Gasner, 2015). Pogarsky, Roche, and Pickett (2018) outlined recent advancements on offender decision-making that are attributable to behavioral economics. They devoted considerable attention in their review to *prospect theory* (Kahneman & Tversky, 1979), a "quasi-rational" model of decision processes generally considered part of system 2.[2] More recently, researchers have expounded the dual-systems aspects of behavioral economics. Kahneman and Frederick (2002, p. 51) observed that, "[C]ognitive processes can be partitioned into two main families – traditionally called intuition and reason." Kahneman (2011) explained that system 2 processes are controlled, effortful, slow, self-aware, rule-following, and effable. In contrast, system 1 processes are intuitive, automatic, effortless, fast, unconscious, and ineffable (Thaler & Sunstein, 2009). According to Kahneman (2003), system 1 instinctual processes run continuously, whereas system 2 stays in "low effort mode." System 2 often remains unengaged; involvement takes effort and is thus reserved for times when system 1 encounters difficulty or dissonance.

Although much prior research on offender decision-making has targeted system 2 processes, dual-process thinking is becoming increasingly evident in criminology. A prominent example is the hot/cool perspective of van Gelder and de Vries (2012, 2014). The hot mode of processing is affective and based on emotions such as fear and anger. The cool mode entails the type of dispassionate reasoning associated with rational choice theories of crime. Behavioral economics has a broader conception of system 1 than this; it includes visceral influences but also intuitions and cognitive heuristics or shortcuts. Thomas and McGloin (2013) invoked dual-process reasoning to distinguish normative peer influences, which involve attitudinal change over time, from socializing peer influences that are more momentary. Mamayek, Loughran, and Paternoster (2015) applied dual-process principles to distinguish core decision-making constructs, such as impulsivity, self-control, and thoughtfully reflective decision-making (TRDM; Paternoster, Pogarsky, & Zimmerman, 2011). Our aim in this article is to examine the dual-process aspects of behavioral economics for potential innovations in crime theory and policy.

As Thaler, Sunstein, and Balz (2010, p. 428) explained, "People do not make choices in a vacuum. They make them in an environment where many features, noticed and unnoticed, can influence their decisions." This environment comprises a *choice architecture* for offending decisions. In turn, various *nudges* are possible that leverage aspects of the choice architecture toward conformity. Thaler and

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Sunstein (2009, p. 6) defined a nudge as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives." The logic is to capitalize on the existence of system 1 and its interrelationship with system 2. Thus, aspects of the choice architecture can influence system 2 assessments, such as when an individual's affect pool affects cognitive assessments of risks, costs, and rewards (Pogarsky, Roche, & Pickett, 2017; see also Barnum & Solomon, 2019). Nudges can also be used to influence the salience of signals in the decision environment that alter perceptions of risk (e.g., Roach, Weir, Phillips, Gaskell, & Walton, 2017). Finally, nudges can be used to bypass system 2 entirely as with reentry checklists or precommitment strategies in which compliance is routinized.

In the ensuing sections, we outline several categories of nudges with relevance for offender decision-making and crime policy. Throughout, we connect the discussion to criminological theory. Some principles discussed below, such as morality and emotions, are familiar in criminology, but not as part of a choice architecture for offending decisions. Other principles discussed here are less (although not un-) familiar in criminology—for example, simplification, precommitment, and social comparison.

1 | INFORMATIONAL CONTENT

Information has been a pervasive concept in offender decision-making discourse. The criminal justice system is designed to encourage conformance with the law in part through behavioral (dis)incentives. Punishments are threatened, publicized, and imposed to underscore that crime is risky and costly and should be avoided. Thus, deterrence can be considered "information transmission" aimed at offenders' risk perceptions. Geerken and Gove (1975, p. 498) reasoned that "only analysis of all the sources of information about risk and severity of punishment and how they are related to social environment, crime rate, and the actual risk and severity of punishment will enable us to understand how punishment relates to crime in a real society."

If perceptions about the risks of being caught influence crime decisions, then the information underlying those risk perceptions is crucial. Elevating perceptions of sanction risk is a key lever for crime policy (Nagin, 1998, 2013). *Informational nudges* can both inject new information into the decision environment and affect the salience of specific items. Sunstein (2014, p. 5) explained that disclosure of information can serve as a check on inattention, negligence, incompetence, wrongdoing, and corruption (see also House of Lords, 2011).

Outside of criminology, informational nudges include labels for fuel economies, CO_2 emissions, and green issues (Codagnone et al., 2016) or labels for identifying the calories in food (Kersh, 2015) and the use of positive messages about the benefits of increased housing density (Doberstein, Hickey, & Li, 2016). Furthermore, Asensio and Delmas (2015) created a website sharing detailed electricity usage with messages linking this usage to environmental and health issues. Their findings revealed a significant reduction in energy usage. Providing basic information can increase the salience of these issues, and promote the desired change in behavior.

Regarding crime policy, informational nudges are generally meant to elevate an individual's perception of the risk of being caught for a crime, and deter them. For example, seeking to decrease car theft in northeastern England, Roach et al. (2017) distributed leaflets to residents in two treatment areas encouraging potential victims to lock their cars. The leaflets did not include explicit instructions to residents to lock their vehicles but included statements such as "More than a 1/3 of thefts from vehicles in your area involved unlocked cars. WHY? Because it's EASY" and "Thieves don't mind if it's your things they take so why make it EASY for them? KEEP YOUR THINGS!" Both treatment areas saw a reduction in the percentage of thefts from insecure vehicles (33% and 25% respectively). The increase

in awareness or salience of car theft encouraged potential victims to lock their cars and thus decrease theft.

Similarly, to reduce bicycle theft, Sidebottom, Thorpe, and Johnson (2009) placed stickers on bicycle racks in central London, which illustrated how to lock and secure a bicycle to the bicycle parking facility. Four treatment locations and one control location were included in the studies. The findings from study one revealed statistically significant increases in better locking practices and a statistically significant reduction in bad locking practices in the treatment group but not at the control location. Results were replicated in a second study in which five additional locations were employed. Finally, Pickett (2018) showed a random subset of respondents a video in which a police officer emphasized the high chance of detecting drunk driving at a roadside checkpoint and discussed efforts by law enforcement to reduce drunk driving generally. Viewing the video, relative to an innocuous control video, corresponded with higher perceived arrest risk.

These policy interventions entailed minimal effort and were bureaucratically feasible and inexpensive. Perceived arrest risk can be elevated directly by arresting more people or authorizing more severe punishments. But less intrusive means are also associated with system 1, which entail altering the salience of an adverse consequence by official communication or prompting individuals to guard against potential victimization. These two policy realms can co-exist from a behavioral economic perspective.

2 | FURTHER DIMENSIONS OF CONTENT

Thus far we have addressed information transmission that elevates perceptions of risk, or alternatively, its salience relative to other potential deterrents by means of feedback, disclosure, or factual statements. There are, however, additional dimensions to information transmission from a behavioral economic perspective.

2.1 | Social comparison

A prominent economic premise in offender decision-making discourse is that individuals behave in their narrow self-interest. This premise is a core assumption of Becker's (1968) model, in which potential offenders and law enforcement pursue assumed self-interests and, thereby, generate equilibria regarding the number of offenses and public expenditures to reduce them. The assumption helped fuel decades of crime control aimed primarily at increasing the perceived and actual costs of crime for offenders. Yet criminologists have long found that informal and nonlegal factors play a major role in conformity (e.g., Hirschi, 1969; Warr, 2002). Individuals have strong social preferences to join and identify with groups, with often commensurately strong intuitions favoring cooperation and collective action (Rand, Newman, & Wurzbacher, 2015).

Thus, criminologists continue to investigate social influence and coordination (Hoeben & Thomas, 2019, pp. 759–784; Loughran, 2019, pp. 737–758). Individuals learn and internalize norms, values, and motives through socialization with friends and family, and these shifts in definitions toward crime shape behavior over time (Akers, 1998; Sutherland, 1947). Furthermore, the presence of peers can make immediate behaviors feel easier, less risky, and more rewarding (Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996; Warr, 2002). Using ultimatum and dictator game experiments from economics, Jaynes and Loughran (2018) found that impacts on others can influence crime decisions.[3]

It is this apparent predisposition to belong to a group, as well as to avoid social disapproval, that raises the possibility of social comparison nudges for crime control. Thaler and Sunstein (2009, p. 61)

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highlighted the nudging potential of social influence with the "Don't mess with Texas" anti-littering initiative. In numerous failed attempts to reduce litter on Texas highways, the reasoning adopted was that it was one's civic duty to stop littering. But then, Texas adopted an alternative approach. The state employed a "Don't mess with Texas" slogan to prompt the spirit of Texas pride. In so doing, they shifted emphasis to group or social norms. The slogan was displayed in television ads, billboards, and other venues, and litter was subsequently reduced dramatically.

Social comparison nudges have also been directed at energy conservation (e.g., Allcott, 2011; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Nolan and colleagues (2008) used door hangers to encourage energy conservation. As the basis for comparison, some door hangers appealed to social influence by claiming (truthfully) that high percentages of residents were conserving energy through one specified behavior; other door hangers appealed to self-interest (you can save money), environmental protection (you can help reduce greenhouse gases), and social responsibility (you can help future generations). Significantly more energy was conserved by those who received the social responsibility message versus those who did not. Similarly, Allcott (2011) conducted a randomized field experiment of 600,000 in which the experimental group received a report comparing its electricity usage with that of its neighbors. The intervention reduced energy consumption by 2%.

Regarding crime policy, signs are increasingly posted on college campuses that read, for example, "94% of students choose not to use illegal drugs" or "85% of students don't use medications prescribed to others." At the University at Albany, for example, such signs contain information pertaining to social media accounts of "Albany social norms," where further social comparisons are prominent. On the academic website, it is noted that the intention of these posters is "for students to learn that healthy behaviors are the norm and will then be able to make well informed decisions about their health."

Relatedly, Nettle, Nott, and Bateson (2012) displayed an image of watching eyes to increase social conformity (see also Bourrat, Baumard, & McKay, 2011; Burnham & Hare, 2007; Ekström, 2012; Haley & Fessler, 2005). These images appeared at three different locations with the goal of decreasing bike theft. Reported thefts were monitored for 12 months before and after the intervention. Bicycle thefts decreased by 62% at the experimental locations but increased by 65% in the control locations, which indicates that the signs were effective but displaced offending to locations with no signs. The picture of "watching eyes" continually reminds individuals of the social norm against stealing and, as a result, discourages offending. In sum, policy makers can potentially limit a range of criminal behaviors by leveraging peoples' innate desire to cooperate and belong to a group while still recognizing that self-interest matters.

2.2 | Affective

Visceral influences and emotions have been pervasive themes in crime scholarship. For example, in the strain perspective, there are various routes to delinquency. There can be a disjunction between fair and actual life outcomes or the introduction of some noxious stimulus. Whatever the trigger, though, the hypothesized mechanism is the same—negative emotions are experienced, which elevate the risk of delinquency (Agnew, 1992). Yet in the strain perspective, only negative emotions stemming from the interrelationship of internal aspirational states with external circumstances are recognized. There is little recognition of positive emotions or of affective drive states (e.g., sexual arousal). In addition, strain is treated almost as a persistent and enduring "condition." According to the theory, how circumstances of specific offending opportunities can interrelate with particular emotional states or influences is nonimportant.

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Emotions have also been included in rational choice research. Consider the roles of shame and guilt in deterrence, which are typically modeled as "informal sanctions," the conceptual counterpart to legal sanctions (Grasmick, Bursik Jr., & Arneklev, 1993; Nagin & Pogarsky, 2001). Under this logic, just as individuals wish to avoid legal punishment, they also seek to escape informal sanctioning, which is a powerful source of deterrence. But as van Gelder (2017, p. 468) observed, the hypothesized process entails anticipating a potential, albeit informal, future adverse consequence from crime and conforming to avoid experiencing the anticipated cost.

In the dual-process behavioral economic model of Kahneman (2011), emotional factors can contribute to the choice architecture for an offending decision. Thus, *visceral nudges* are possible to alter the way an actor feels about a topic, event, or choice. These types of nudges trace directly to the affect heuristic, in which an actor's "affect pool" influences perceptual assessments (Slovic, Finucane, Peters, & MacGregor, 2004). As Pogarsky et al. (2017), p. 9) explained, if people's "feelings toward an activity are favorable, they are moved toward judging the risks as low and the benefits as high," which leads perceived risk and benefit to be "negatively correlated in people's minds (and judgments)," even though they are often positively correlated in reality (Slovic et al., 2004, p. 315).

In Pogarsky et al. (2017)), survey respondents were provided with information designed to manipulate their emotions toward texting while driving. The information appeared immediately before inquiry of cost and benefit assessments and was presented as an empirical finding (i.e., "A new study shows … "). Respondents were randomly assigned to receive information that was negative (texting while driving is a leading cause of teen deaths), neutral (most cell phone users text daily), or positive (couples who text regularly stay together). The experiment produced a successful visceral nudge. The mean perceived chance of being stopped by police was 26% in the negative information group, 23% in the neutral information group, and 21% in the positive information group. Thus, exposure to emotion-laden information alters perceptions of sanction risk in a manner consistent with the affect heuristic.

Another form of a visceral nudge emerges from the desired maintenance of self-approval. People tend to behave in ways that make them feel good about themselves (Mazar, Amir, & Ariely, 2008) and, therefore, elicit positive affect. If an actor fails to comply with personal internal standards of behavior, the actor will reduce his or her self-concept and self-approval, which is aversive (Kahneman, 2011). Conversely, if an actor complies with personal behavioral standards, the actor avoids such negative updating, maintains positive self-approval, and is affectively rewarded (Mazar et al., 2008). Thus, appealing to positive self-assessment through modification of the choice architecture holds potential as a prosocial nudge.

For example, to reduce littering in a neighborhood in Philadelphia, the local council hired actors in giant litter costumes to "create a scene" in the busy streets. The actors engaged with the public by cheering and thanking passersby who put litter in the nearby bins (Dolan, Hallsworth, Halpern, King, & Vlaev, 2010). People were informed (increasing salience) of the litter issue, while receiving a visceral affirmation for acts of recycling. Researchers have suggested the novel approach reduced apathy about littering (Dolan et al., 2010). Furthermore, Asensio and Delmas (2016) found that sharing information about the harmful health and environmental effects of electricity consumption reduced energy usage by approximately 8%, whereas attempting to reduce energy consumption through billing-oriented messages was ineffectual. The affective appeal of self-approval likely supported this successful nudge. Schuilenburg and Peeters (2015) discussed an initiative to reduce speeding in the Netherlands, in which an electronic face smiles at people who drive at or below the speed limit and frowns at drivers who speed. This is again based on notions of positive and negative affirmation. In sum, in physical or factual modifications in which emotion is altered to sway perceptions and preferences and/or positive affirmation to appeal to emotion about a particular act, decision-making can be influenced.

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2.3 | Morality

Generally, morality refers to a system of values that correspond to cultural codes concerning the distinction between right and wrong or good and bad (e.g., Haidt & Kesebir, 2010). Recently, some researchers have recognized morality as a multifaceted concept that is likely dependent on not only a general value system corresponding to cultural norms but also behavioral- and situation-specific moral attitudes (Herman & Pogarsky, working paper). Moreover, morality is referred to as part of an overall self-definition or identity (Blasi, 1984; Damon & Hart, 1992). Research has demonstrated that people balance multiple facets of their identities, which can ebb and flow in prominence at a given time (Carver & Scheier, 1998; Minsky, 1988). Consequently, the influence of any single facet of identity, including an individual's moral self-conception, is a function of how accessible or salient that facet is in any given situation (Aquino, Freeman, Reed II, Lim, & Felps, 2009; Skitka, 2003).

Furthermore, morality is correlated with criminal behavior. For example, moral concerns have been treated as a potential cost of offending, specifically, as an extralegal sanction. Just as potential offenders should consider the risks and costs entailed in suffering legal consequences, they should consider any nonlegal costs as well. Grasmick, Bursik, and Arneklev (1993, p. 840) explained that self-imposed costs arise from the violation of an internalized norm, which can lead to guilt, psychological discomfort, reduced self-concept, and even anxiety and depression. Here morality is an internally experienced and self-imposed potential adverse consequence from offending. Morality has also been treated as a moderating variable. Research findings have shown, for example, that traditional deterrence considerations of risks, costs, and benefits have a smaller role in offending decisions among highly moral persons (Bachman, Paternoster, & Ward, 1992; Paternoster & Simpson, 1996). As Etzioni (1988) observed, persons with high moral inhibition are "out of market" for offending; their decisions to refrain from crime are internally and nonlegally based. Wikström (2006) extended these ideas, theorizing that morality *filters* out the possibility of transgression, meaning that moral concerns preempt an instrumental balancing of costs, benefits, and risks (see also Brauer & Tittle, 2017).

If then morality is associated with prosocial behavior, and is situationally dependent, moral sources of restraint can be primed through *moral nudging*. For example, Mazar et al. (2008) asked some respondents to recall the Ten Commandments and asked control respondents to recall 10 books they had recently read. Thereafter, both groups completed an ethics-related task. Respondents asked to recall the Ten Commandments cheated significantly less compared with individuals in the control group. But there were no differences among experimental respondents related to the number of commandments remembered. Rather, prompting individuals with a biblical notion seems to have primed moral salience.

Moral priming has potential relevance for crime policy. For example, Mazar and Zhong (2010) found that merely exposing people to environmentally friendly "green" products can increase ethical behavior. They suggested that norms related to social responsibility and ethical conduct were triggered by exposure to these products. Additionally, this exposure led individuals to behave more altruistically when subsequently allocating money in a dictator game (see also Reynolds, Leavitt, & DeCelles, 2010). Thus, moral reminders in an everyday setting may activate or increase moral salience and thus promote conformity in an automatic or intuitive way (Bargh, Chen, & Burrows, 1996; Haidt, 2001).

3 | BEYOND INFORMATIONAL CONTENT

Several further aspects of choice are related more to the mechanism or procedure for information transmission. These also present interesting possibilities for nudges.

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3.1 | Simplification

The rational choice or system 2 perspective is often criticized for being abstract, reductionist, and not realistically reflective of the complexities in real-world offending situations. These complexities grow in the presence of others, when unexpected events occur, and under time pressure and visceral or intoxicating influences. One way to navigate complexity is with cognitive perseverance, which is an attribute of system 2.

Frederick (2005) captured this type of thinking with a three-item cognitive reflection test (CRT). One question was as follows: "A bat and a ball cost $1.10. The bat costs $1.00 more than the ball. How much does the ball cost? __ cents."[4] Here the impulsive, "neat-and-even" answer tends to be 10 cents, but it is wrong. Further cognitive effort is needed to persevere to the correct answer of 5. Frederick (2005) found that lower cognitive reflection was correlated with greater present orientation and risk-seeking behavior (for losses), which are both correlates of criminal behavior. Nagin and Pogarsky (2003) also found that low cognitive reflection indicated greater present orientation and, in addition, actual cheating to earn extra money for a laboratory task.

Another approach to complexity involves cognitive heuristics or shortcuts. According to Gigerenzer and Gaissmaier (2011, p. 454), "a heuristic is a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods." Offenders sometimes simplify the decision-making environment to further their antisocial objectives. For example, residential burglars are known to rely on specific signals (car in the driveway, lights on) for a quick assessment of whether someone is home. These outward manifestations of human presence in the home risk error. The offender could enhance the accuracy of the assessment by entering the home. But these accuracy gains do not seem worth it as entering the home first increases the risk to the potential offender of adverse consequences resulting from a surprise encounter with an occupant of the target home.

Heuristics can also serve prosocial objectives with *simplification nudges*. For example, Bettinger, Long, Oreopoulos, and Sanbonmatsu (2012) conducted an experiment to test whether a "simplified" Free Application for Federal Student Aid (FAFSA) could increase college enrollment. They found that 36% of high-school seniors whose parents received the treatment completed 2 years of college, compared with 28% of control respondents, during the first 3 years after the experiment. Families who received aid information but no assistance with the FAFSA did not experience improved outcomes. Chapman, Li, Colby, and Yoon (2010) reported a randomized experiment in which treatment participants were automatically assigned to a nonmandatory flu-shot appointment time (opt-out default) and participants in the control group were only provided information about the available shots (opt-in default). In this case, the simplification default nudge was effective. In the opt-out condition, 45% of respondents were vaccinated at the occupational health department compared with 33% in the opt-in condition.

Simplification nudges operate by modifying the choice architecture to make prosocial behavior less cognitively effortful. This is evident from the existence of prisoner reentry or "prerelease" handbooks (Mellow & Dickinson, 2006). An obvious challenge for successful reentry after incarceration is that inmates are released into an increasingly complex society after a period of likely disruption in the acquisition and maintenance of prosocial personal and social capital. Recognizing that humans often have difficulty under conditions of chaos, complexity, and scarcity, reentry handbooks are designed to organize and consolidate the agency entailed in remaining compliant after release. Thus, the handbook contains three checklists, one each for before release, after returning home, and after the released inmate is "a bit more settled in" (Federal Bureau of Prisons, 2016, p. 1). To streamline decisions to conform with the law, the checklist disaggregates and isolates key steps, such as managing money,

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promoting one's physical and emotional health, and rebuilding relationships. More and more states have adopted this technique as a decision aid for the successful reintegration of jail and prison inmates into society.

3.2 | Precommitment

Mischel (1961) initiated a theoretical perspective in psychology grounded in notions of will power. In his "marshmallow experiments," children chose between an immediate reward or a larger reward after some period of delay. Those less able to delay gratification for the larger reward had lower SAT scores; weaker social, cognitive, and emotional coping skills; more mental health problems; and histories of drug use and other adverse life outcomes (Mischel, 2012). In this view, persons are assumed to be self-interested, impatient, and vulnerable to temptation, and some mechanism is needed to restrain or control these tendencies.[5]

These assumptions underlie the control perspective in criminology. Reiss's (1951) seminal work on control was titled *Delinquency as the Failure of Personal and Social Controls*. Like Reiss, Reckless (1961), in *Containment Theory*, proposed that social control had two sources. Inner containment results from strong self-concept, goal orientation, frustration tolerance, and a commitment to norms, whereas outer containment results from social forces proximate to the individual.

Hirschi (1969) advanced this thinking by observing that the pertinent question for criminologists is not why people offend but why they refrain, the operating premise for *Social Control Theory*. From this perspective, the sources of control are external to the individual. Thereafter, Gottfredson and Hirschi (1990) transformed the control perspective inward, attributing transgression to the second element of control proposed by Reiss (1951, p. 196): personal control. In this view, crime results from a failure of self-control, a personal attribute conceptualized as the inability to delay gratification. There are many comparable notions to will power or self-regulation in crime research. These include impulsivity (Whiteside & Lynam, 2001), discounting (Nagin & Pogarsky, 2001), nothing to lose (Harris, Duncan, & Boisjoly, 2002), and fatalism (Brezina, Tekin, & Topalli, 2008). These concepts gain particular relevance because although the benefits to the offender are typically immediate, various potential costs are delayed.

People, however, generally seek to avoid adverse consequences from self-destructive behaviors resulting from our inability to delay gratification (Ariely, 2008). This, in combination with the human desire for self-consistency (Mazar et al., 2008), raises the possibility of *precommitment nudges.* Time-inconsistent preferences (e.g., eating the fattening brownie when everyone else is enjoying dessert and stealing $20 from an exposed purse) create obstacles to following a planned or ideal course of action (Ariely & Wertenbroch, 2002). Beyond exercising willpower to resist temptation (Hoch & Loewenstein, 1991; Muraven & Baumeister, 2000), people can "precommit" to a future course of action (Schelling, 1992; Thaler & Shefrin, 1981; Wertenbroch, 1998). Precommitment provides a mechanism to achieve goals (Sunstein, 2014). Even the act of writing a commitment can increase its likelihood of fulfillment (Cialdini, 1993). Precommitment nudges can then be used to alter the choice architecture by introducing a contract with one's self.

Williams, Bezner, Chesbro, and Leavitt (2005) studied the completion of exercise programs. Completion rates were significantly higher in the treatment group where respondents signed a contract specifying their exercise goals than in the control group where they did not. Milkman, Beshears, Choi, Laibson, and Madrian (2011) studied the obtainment of flu vaccinations. The treatment group was notified of the free vaccination and was prompted to write down details (e.g., date and time) of when they planned to obtain the vaccination, whereas the control group simply received word of the free vaccination. Individuals who received the precommitment prompt had significantly higher vaccination

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rates than in the control group. Similarly, in efforts to increase charitable book donations, John, Smith, and Stoker (2009) sent letters to 12,000 households in Manchester asking people to donate a book to help set up a school library in South Africa. Households were randomly assigned to three groups: Pledge group, who received a letter advertising the book collection and asking them to pledge a book; Pledge and publicity group, who received a letter, were asked to pledge, and were told that a list of donors would be displayed in the local drop-off points; and Control group, who just received a letter asking for the donation. Both precommitment nudges achieved more donations than in the control group.

Precommitment nudges can encourage forward-thinking choices by having the decision already made in a cool, dispassionate state before the critical moment arises and then capitalizing on the human inclination to live up to one's choices and maintain self-consistency (Mazar et al., 2008). Consider the example of acceptable behavior contracts (ABCs) in the United Kingdom. ABCs generally involve an informal meeting between the offender, his or her parents (if applicable), and the police. All agree and commit to what is and is not acceptable behavior. Although there is no legal sanction, ABCs can nevertheless be effective in reducing antisocial behavior. An evaluation of a similar precommitment contract was conducted in 2008 (Evans, Hall, & Wreford, 2008). The contract reflected an agreement between parents and the local school authority with details concerning parental support to improve the child's behavior and/or school attendance. Support ranged from the family being bought an alarm clock to parents being offered a place on parenting skills courses. Schools, local authorities, and parents were generally positive about the role of parental contracts in reducing nonattendance and improving behavior. Most schools involved in the evaluation had attendance significantly improve as a result of these agreements (Evans et al., 2008). Iwry and Kleiman (2017) proposed a similar approach to accompany the recent advent of marijuana legalization across the United States. They advocated for "nudges toward temperance." The idea is that as part of gaining legal access to cannabis for recreational use, users can be required to set personal monthly quantity limits. This logic could even extend to potential legal alcohol use by 18–21 year olds.

Precommitting affords people the opportunity to select their preferred path upfront in a cool and deliberative state and therefore overcome the impulsive inability to delay immediate gratification. As Ariely stated, "[W]ithout precommitment, we keep on falling for temptation" (2008, p. 146). The use of precommitments is to expand on traditional deterrence thinking by allowing individuals to guard against their potentially impulsive tendencies.

4 | CONCLUSION

This article began with the traditional criminological notion of deterrence and offender decision-making as information transmission (Geerken & Gove, 1975). This idea is often grounded in familiar economic principles of elevating the perceived risks and costs of crime for potential offenders. But in behavioral economics, an expanded perspective on information transmission is offered through relaxation of unrealistic assumptions about human nature and identification of how individuals deviate predictably from rational choice norms. Pogarsky et al. (2018) outlined the prospect theoretic (and some dual-process) implications of this thinking for offending decisions. We further explored the dual-process nature of behavioral economics, which led us to the nudge perspective of Thaler and Sunstein (2003, 2009). The perspective is grounded explicitly in dual-process behavioral economics, in which two types of cognitive operations co-exist and interrelate—one governed by intuition and the other by reason. Crime theory and policy has often confined attention to system 2, thus, systematically neglecting parts of the choice architecture for offending decisions.

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Nudges are not necessarily new to public policy. In 2008, President Obama appointed Cass Sunstein, recent co-author of *Nudge* Thaler & Sunstein, 2009, head of the Office of Information and Regulatory Affairs. In 2010, Great Britain established The Behavioral Insights Team or *Nudge Unit* to "transform policy … through an understanding of behavioral approaches" and "achieve at least a tenfold return on the cost of the unit" (Halpern, 2015, p. 54). Kahneman (2013) suggested nudges can be used to generate "medium sized gains by nano-sized investments." And Sunstein (2014) observed that potential nudges often have little downside—ordinarily, if they are ineffective, there are few if any adverse collateral consequences.

But at its core behavioral economics is an economic theory. That in behavioral economics, a traditional economic premise is either contradicted or elaborated on can generate a misconception about the implications of behavioral economics for criminology. It would be misleading to pit intuition and reason against one another; in behavioral economics, these distinct mental operations co-exist. Both Nobel Laureates in behavioral economics have emphasized this. Thaler (1994) titled his collection of behavioral economic challenges to traditional economics, *Quasi Rational Economics*. Thaler wrote (1994, pp. xxi–xxii): "How should economists react to this? First let me suggest what I think is the wrong answer … that economists fold up their tent and go home. . . . Just the opposite … perhaps we can construct better economic models by recognizing the agents in the economy are human." Thaler (1996) further characterized behavioral economics as "economics with a higher R squared." Moreover, after decades of empirical challenges to expected utility theory by behavioral economic scholars, Kahneman (2011) considered expected utility theory "the most important theory in social science." Thus, rather than reject or divert attention from general notions of choice and incentives, behavioral economics is designed to provide an elaborated and more descriptively accurate treatment of choice and incentives.

Proponents of nudge-type thinking highlight the low cost and risk of nudge policies relative to more traditional crime control. Kahneman (2013) famously touted the potential for "medium-sized gains from nano-sized investments." And Thaler and Sunstein (2009) emphasized that, even if the nudge is ineffectual, there is little risk of unanticipated but adverse consequences. But a more principled objection exists relating to whether nudges constitute an inappropriate degree of social engineering to protect people from their deviant and/or neglectful instincts. Thaler and Sunstein (2009) defend this notion as "libertarian paternalism." Sunstein (2014) argued that refraining from nudging leaves the status quo choice architecture in place, which then becomes a nudge in its own right.

This is further complicated by the possibility of an "inadvertent" or "wrong way" nudge. In 2011, British cabinet official Oliver Letwin introduced an initiative designed to boost crime reporting. The idea was to make online crime maps publicly available. But this had the reverse impact. Research was underway at the time aimed at demonstrating the adverse impact neighborhood crime was having on home values (Gibbons, 2014). Thus, the crime data provided a nudge in the wrong direction. It served as a constant reminder of the diminution in home values crime produced, thus, encouraging people NOT to report to preserve real estate values in the community. In sum, the broader array of behavioral influences at work in an expanded view of the offending decision, which attends not only to core deterrence perceptions but also to aspects of choice architecture, underscores the importance of nudging properly to avoid unintended impacts.

We sought to elaborate some implications from the dual-process aspects of behavioral economics for the nexus of crime theory and policy. This led us to identify a choice architecture in which familiar decision-making constructs are undergirded, such as perceptions of formal and informal costs from offending, perceived benefits, and risk preference. We hope to have underscored the promise of this type of thinking for issues of agency and choice in criminology.

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ENDNOTES

[1] For example, *Miranda v. Arizona* (1966) regularized protections against self-incrimination for defendants undergoing custodial interrogation, and *Gideon v. Wainwright* (1963) mandated a right to counsel in state criminal cases where incarceration is authorized.

[2] For example, in contrast to traditional economic perspectives that can be traced directly to subjective expected utility theory (Savage, 1954; von Neumann & Morgenstern, 1944), preference for risk is context dependent. That is, prospect theory shows how individuals tend to be risk averse when they perceive a decision involves a gain but risk seeking when they perceive the decision involves a loss. Both Pogarsky, Roche, and Pickett (2018) and Thomas and Loughran (2014) addressed this and other prospect theory principles underlying criminal choice.

[3] In both games, two people must split a sum of money. In the dictator game, the proposer makes one offer of how to split (say 50–50, or 75–25) the money between the two. The other player can either accept the offer or reject it; in which case, both players receive nothing. Alternatively, in the dictator game, the proposer's first offer is immediately binding. For purely self-interested actors, the empirical expectations are clear. In the ultimatum game, the proposer should offer $.01, which should be accepted under the reasoning that a penny is better than nothing. In the dictator game, the proposer should keep all the money as there are no ostensible consequences for offering nothing. Yet this does not occur. Instead, in both games, offers routinely reach 25% to 30%, even 50–50. Moreover, Jaynes and Loughran (2019) found that convicted offenders tended to offer less in these games compared with nonoffenders, suggesting the measure may tap an individual-level "other-regarding preference," which is prosocial.

[4] The other two questions are as follows: (1) "If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?" and (2) "In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? ___ days" (Frederick, 2005, p. 27).

[5] Watts, Duncan, and Quan (2018) recently only partially replicated the core finding of Mischel and colleagues that delaying gratification reflects an enduring personal attribute responsible for a range of positive life outcomes. Although the authors found the same statistically significant association, its magnitude was only half that in the original studies, and it was reduced to one third of the original effect when family background, early cognitive ability, and home environment were controlled for.

REFERENCES

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, *30*(1), 47–87. https://doi.org/10.1111/j.1745-9125.1992.tb01093.x

Akers, R. L. (1998). *Social structure and social learning*. Los Angeles: Roxbury.

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, *95*(9-10), 1082–1095.

Aquino, K., Freeman, D., Reed II, A., Lim, V. K., & Felps, W. (2009). Testing a social-cognitive model of moral behavior: The interactive influence of situations and moral identity centrality. *Journal of Personality and Social Psychology*, *97*(1), 123.

Ariely, D. (2008). *Predictably irrational* (pp. E2). New York: Harper Audio.

Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines, and performance: Self-control by precommitment. *Psychological Science*, *13*(3), 219–224.

Asensio, O. I., & Delmas, M. A. (2015). Nonprice incentives and energy conservation. *Proceedings of the National Academy of Sciences*, *112*(6), E510–E515.

Asensio, O. I., & Delmas, M. A. (2016). The dynamics of behavior change: Evidence from energy conservation. *Journal of Economic Behavior & Organization*, *126*, 196–212.

Bachman, R., Paternoster, R., & Ward, S. (1992). The rationality of sexual offending: Testing a deterrence/rational choice conception of sexual assault. *Law & Society Review*, *26*, 343.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, *71*(2), 230.

Barnum, T. C., & Solomon, S. J. (2019). Fight or flight: Integral emotions and violent intentions. *Criminology*, *57*(4). Epub ahead of print. https://doi.org/10.1111/1745-9125.12222

17459133, 2019, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/1745-9133.12470 by Harvard University, Wiley Online Library on [24/01/2023]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Becker, G. S. (1968). Crime and punishment: An economic approach. In N. G. Fielding, A. Clarke, & R. Witt (Eds.), *The economic dimensions of crime*. London, England: Palgrave Macmillan.

Becker, G. S. (1995). *Human capital and poverty alleviation*. Washington: World Bank, Human Resources Development and Operations Policy.

Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *The Quarterly Journal of Economics*, *127*(3), 1205–1242.

Blasi, A. (1984). Moral identity: Its role in moral functioning. *Morality, Moral Behavior, and Moral Development*, 128–139.

Bourrat, P., Baumard, N., & McKay, R. (2011). Surveillance cues enhance moral condemnation. *Evolutionary Psychology*, *9*(2), 193–199.

Brauer, J. R., & Tittle, C. R. (2017). When crime is not an option: Inspecting the moral filtering of criminal action alternatives. *Justice Quarterly*, *34*(5), 818–846.

Brezina, T., Tekin, E., & Topalli, V. (2008). *"Might not be a tomorrow": A multi-methods approach to anticipated early death and youth crime* (No. w14279). Washington: National Bureau of Economic Research.

Burnham, T., & Hare, B. (2007). Engineering human cooperation: Does involuntary neural activation increase public goods contributions in human adults. *Human Nature*, *18*(2), 88–108.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge University Press.

Chalfin, A., & McCrary, J. (2017). Criminal deterrence: A review of the literature. *Journal of Economic Literature*, *55*(1), 5–48.

Chapman, G. B., Li, M., Colby, H., & Yoon, H. (2010). Opting in vs opting out of influenza vaccination. *JAMA*, *304*(1), 43–44.

Cialdini, R. B. (1993). *Influence: The psychology of persuasion* (Rev. ed.). New York: Morrow.

Codagnone, C., Veltri, G. A., Bogliacino, F., Lupiáñez-Villanueva, F., Gaskell, G., Ivchenko, A., … Mureddu, F. (2016). Labels as nudges? An experimental study of car eco-labels. *Economia Politica*, *33*(3), 403–432.

Damon, W., & Hart, D. (1992). Self-understanding and its role in social and moral development. In M. H. Bornstein & M. E. Lamb (Eds.), *Developmental psychology: An advanced textbook* (pp. 421–464). Hillsdale: Lawrence Erlbaum Associates, Inc.

Dhami, S. (2016). *The foundations of behavioral economic analysis*. Oxford, England: Oxford University Press.

Doberstein, C., Hickey, R., & Li, E. (2016). Nudging NIMBY: Do positive messages regarding the benefits of increased housing density influence resident stated housing development preferences? *Land Use Policy*, *54*, 276–289.

Dolan, P., Hallsworth, M., Halpern, D., King, D., & Vlaev, I. (2010). *MINDSPACE: Influencing behaviour for public policy*. London, England: Institute of Government.

Ekström, M. (2012). Do watching eyes affect charitable giving? Evidence from a field experiment. *Experimental Economics*, *15*(3), 530–546.

Etzioni, A. (1988). *Moral dimension: Toward a new economics*. New York: Free Press.

Evans, L., Hall, L., & Wreford, S. (2008). *Education-related parenting contracts evaluation* (Research Report DCSF-RR030). London, England: Department for Children, Schools and Families, TNS Social.

Federal Bureau of Prisons (2016). Reentering your community: A handbook.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives*, *19*(4), 25–42.

Geerken, M. R., & Gove, W. R. (1975). Deterrence: Some theoretical considerations. *Law & Society Review*, *9*, 497–513.

Gibbons, J. P. (2014). *Language and the law*. New York: Routledge.

Gideon v. Wainwright, 372 U.S. 335 (1963).

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology*, *62*, 451–482.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford: Stanford University Press.

Grasmick, H. G., Bursik Jr., R. J., & Arneklev, B. J. (1993). Reduction in drunk driving as a response to increased threats of shame, embarrassment, and legal sanctions. *Criminology*, *31*(1), 41–67.

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, *108*(4), 814.

Haidt, J., & Kesebir, S. (2010). Morality. In S. Fiske, D. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., pp. 797–832). Available at SSRN: https://ssrn.com/abstract=1534423

Haley, K. J., & Fessler, D. M. (2005). Nobody's watching?: Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior*, *26*(3), 245–256.

17459133, 2019, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/1745-9133.12470 by Harvard University, Wiley Online Library on [24/01/2023]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Halpern, D. (2015). *The nudge unit: Inside the government department that changed our minds and saved us billions*. London, England: W.H. Allen.

Harris, K. M., Duncan, G. J., & Boisjoly, J. (2002). Evaluating the role of "nothing to lose" attitudes on risky behavior in adolescence. *Social Forces*, *80*(3), 1005–1039.

Herman, S., & Pogarsky, G. (working paper). Morality, deterrability, and offender decision making. Unpublished manuscript.

Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.

Hoch, S. J., & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research*, *17*(4), 492–507.

Hoeben, E. M., & Thomas, K. J. (2019). Peers and offender decision-making. *Criminology & Public Policy*, *18*(4), 759–784.

House of Lords. (2011). *Behaviour change*. London, England: House of Lords Select Committee on Science and Technology.

Iwry, J., & Kleiman, M. A. (2017). A nudge toward temperance: User-set consumption limits as an element of cannabis policy. Available at SSRN: https://ssrn.com/abstract=3166307 or https://doi.org/10.2139/ssrn.3166307.

Jaynes, C. M., & Loughran, T. A. (2018). Social preferences as an individual difference in offender decision-making. *Journal of Research in Crime and Delinquency*, *56*(1), 129–169.

John, P., Smith, G., & Stoker, G. (2009). Nudge nudge, think think: Two strategies for changing civic behaviour. *The Political Quarterly*, *80*(3), 361–370.

Kahneman, D. (2003). Maps of bounded rationality: Psychology for behavioral economics. *American Economic Review*, *93*(5), 1449–1475.

Kahneman, D. (2011). *Thinking, fast and slow* (Vol. 1). New York: Farrar, Straus and Giroux.

Kahneman, D. (2013). Nobel-winning psychologist Daniel Kahneman explains his problem with people using the term 'behavioral economics.' (J. Singal, Interviewer). Retrieved from https://www.thedailybeast.com/daniel-kahnemans-gripe-with-behavioral-economics?ref=scroll

Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. *Heuristics and Biases: The Psychology of Intuitive Judgment*, *49*, 81.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*, 263–292.

Kersh, R. (2015). Of nannies and nudges: The current state of US obesity policymaking. *Public Health*, *129*(8), 1083–1091.

Loughran, T. A. (2019). Behavioral criminology and public policy. *Criminology & Public Policy*, *18*(4), 737–758.

Loughran, T. A., Paternoster, R., Chalfin, A., & Wilson, T. (2016). Can rational choice be considered a general theory of crime? Evidence from individual-level panel data. *Criminology*, *54*, 86–112.

Mamayek, C. M., Loughran, T., & Paternoster, R. (2015). Reason taking the reins from Impulsivity: The promise of dual-systems thinking for criminology. *Journal of Contemporary Criminal Justice*, *31*(4), 426–448.

Matsueda, R. L. (2013). Rational choice research in criminology: A multi-level framework. *Handbook of Rational Choice Social Research*, 283–321.

Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research*, *45*(6), 633–644.

Mazar, N., & Zhong, C. B. (2010). Do green products make us better people? *Psychological Science*, *21*(4), 494–498.

Mellow, J., & Dickinson, J. M. (2006). The role of prerelease handbooks for prisoner reentry. *Federal Probation*, *70*, 70.

Milkman, K. L., Beshears, J., Choi, J. J., Laibson, D., & Madrian, B. C. (2011). Using implementation intentions prompts to enhance influenza vaccination rates. *Proceedings of the National Academy of Sciences*, *108*(26), 10415–10420.

Minsky, M. (1988). *The society of mind*. New York: Simon & Schuster.

Miranda v. Arizona, 384 U.S. 436 (1966).

Mischel, W. (2012). Self-control theory. In P. A. M. Van Lange, A. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. *2*, pp. 1–22). Washington: Sage.

Mischel, W. (1961). Delay of gratification, need for achievement, and acquiescence in another culture. *The Journal of Abnormal and Social Psychology*, *62*(3), 543.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, *126*(2), 247.

Nagin, D. S. (1998). Criminal deterrence research at the outset of the twenty-first century. *Crime and Justice*, *23*, 1–42.

17459133, 2019, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/1745-9133.12470 by Harvard University, Wiley Online Library on [24/01/2023]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Nagin, D. S. (2013). Deterrence: A review of the evidence by a criminologist for economists. *Annual Review Econ*, *5*(1), 83–105.

Nagin, D. S., & Paternoster, R. (1993). Enduring individual differences and rational choice theories of crime. *Law & Society Review*, *27*(3), 467–496. https://doi.org/10.2307/3054102

Nagin, D. S., & Pogarsky, G. (2001). Integrating celerity, impulsivity, and extralegal sanction threats into a model of general deterrence: Theory and evidence. *Criminology*, *39*, 865–892. https://doi.org/10.1111/j.1745-9125.2001.tb00943.x

Nagin, D. S., & Pogarsky, G. (2003). An experimental investigation of deterrence: Cheating, self-serving bias, and impulsivity. *Criminology*, *41*(1), 167–194.

Nettle, D., Nott, K., & Bateson, M. (2012). 'Cycle thieves, we are watching you': Impact of a simple signage intervention against bicycle theft. *PloS One*, *7*(12), e51738.

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality And Social Psychology Bulletin*, *34*(7), 913–923.

Osgood, D. W., Wilson, J. K., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Routine activities and individual deviant behavior. *American Sociological Review*, *61*(4), 635–655.

Paternoster, R., Pogarsky, G., & Zimmerman, G. (2011). Thoughtfully reflective decision making and the accumulation of capital: Bringing choice back in. *Journal of Quantitative Criminology*, *27*(1), 1–26.

Paternoster, R., & Simpson, S. (1996). Sanction threats and appeals to morality: Testing a rational choice model of corporate crime. *Law & Society Review*, *30*, 549–584.

Pickett, J. T. (2018). Using behavioral economics to advance deterrence research and improve crime policy: Some illustrative experiments. *Crime & Delinquency*, *64*(12), 1636–1659.

Piquero, A. R., & Tibbetts, S. G. (1996). Specifying the direct and indirect effects of low self-control and situational factors in offenders' decision making: Toward a more complete model of rational offending. *Justice Quarterly*, *13*(3), 481–510.

Pogarsky, G. (2007). Deterrence and individual differences among convicted offenders. *Journal of Quantitative Criminology*, *23*(1), 59–74.

Pogarsky, G., Roche, S. P., & Pickett, J. T. (2017). Heuristics and biases, rational choice, and sanction perceptions. *Criminology*, *55*(1), 85–111. https://doi.org/10.1111/1745-9125.12129

Pogarsky, G., Roche, S. P., & Pickett, J. T. (2018). Offender decision-making in criminology: Contributions from behavioral economics. *Annual Review of Criminology*, *1*, 379–400.

Pratt, T. C., Cullen, F. T., Blevins, K. R., Daigle, L. E., & Madensen, T. D. (2006). The empirical status of deterrence theory: A meta-analysis. *Crime and Justice: A Review of Research*, *15*, 367–396.

Rand, D. G., Newman, G. E., & Wurzbacher, O. M. (2015). Social context and the dynamics of cooperative choice. *Journal of Behavioral Decision Making*, *28*(2), 159–166.

Reckless, W. C. (1961). A new theory of delinquency and crime. *Federal Probation*, *25*, 42.

Reiss, A. J. (1951). Delinquency as the failure of personal and social controls. *American Sociological Review*, *16*(2), 196–207.

Reynolds, S. J., Leavitt, K., & DeCelles, K. A. (2010). Automatic ethics: The effects of implicit assumptions and contextual cues on moral behavior. *Journal of Applied Psychology*, *95*(4), 752.

Roach, J., Weir, K., Phillips, P., Gaskell, K., & Walton, M. (2017). Nudging down theft from insecure vehicles. A pilot study. *International Journal of Police Science & Management*, *19*(1), 31–38.

Savage, L. J. (1954). *The foundations of statistics* (2nd ed.). Mineola: Dover.

Schelling, T. C. (1992). Some economics of global warming. *The American Economic Review*, *82*(1), 1–14.

Schuilenburg, M., & Peeters, R. (2015). From biopolitics to mindpolitics: Nudging in safety and security management. *Open! Platform for Art, Culture & the Public Domain*, 1–7.

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, *18*(5), 429–434.

Sidebottom, A., Thorpe, A., & Johnson, S. D. (2009). Using targeted publicity to reduce opportunities for bicycle theft: A demonstration and replication. *European Journal of Criminology*, *6*(3), 267–286.

Skitka, L. J. (2003). Of different minds: An accessible identity model of justice reasoning. *Personality and Social Psychology Review*, *7*(4), 286–297.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis: An International Journal*, *24*(2), 311–322.

17459133, 2019, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/1745-9133.12470 by Harvard University, Wiley Online Library on [24/01/2023]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Sunstein, C. R. (2014). *Why nudge? The politics of libertarian paternalism*. New Haven: Yale University Press.
Sutherland, E. H. (1947). *Principles of criminology* (4th ed.). Chicago: Lippincott.
Thaler, R. H. (1994). *Quasi rational economics*. New York: Russell Sage Foundation.
Thaler, R. H. (1996). Doing economics without *Homo Economicus*. In S. G. Medema & W. J. Samuels (Eds.), *Exploring the foundations of research in economics: How should economists do economics?* Northampton: Edward Elgar.
Thaler, R. H., & Ganser, L. J. (2015). *Misbehaving: The making of behavioral economics*. New York: W.W. Norton.
Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, *89*(2), 392–406.
Thaler, R. H., & Sunstein, C. R. (2003). Libertarian paternalism. *American Economic Review*, *93*(2), 175–179.
Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. New York: Penguin.
Thaler, R. H., Sunstein, C. R., & Balz, J. P. (2010). Choice architecture. *Available at SSRN 1583509*,
Thomas, K. J., & Loughran, T. A. (2014). *Rational* choice and prospect theory. In G. Bruinsma & D. Weisburd (Eds.), *Encyclopedia of criminology and criminal justice*. New York: Springer Reference.
Thomas, K. J., & McGloin, J. M. (2013). A dual-systems approach for understanding differential susceptibility to processes of peer influence. *Criminology*, *51*(2), 435–474. https://doi.org/10.1111/1745-9125.12010
Tittle, C. R., Ward, D. A., & Grasmick, H. G. (2004). Capacity for self-control and individuals' interest in exercising self-control. *Journal of Quantitative Criminology*, *20*(2), 143–172.
Tonry, M. (2008). Learning from the limitations of deterrence research. *Crime and Justice*, *37*, 279–311.
van Gelder, J. (2017). Emotions in offender decision making. In W. Bernasco, J. van Gelder, & H. Elffers (Eds.), *The Oxford Handbook of Offender Decision Making* (pp. 466–478). New York: Oxford University Press.
van Gelder, J.-L., & De Vries, R. E. (2012). Traits and stated: Integrating personality and affect into a model of criminal decision making. *Criminology*, *50*(3), 637–671. https://doi.org/10.1111/j.1745-9125.2012.00276.x
van Gelder, J.-L., & De Vries, R. E. (2014). Rational misbehavior? Evaluating an integrated dual-process model of criminal decision-making. *Journal of Quantitative Criminology*, *30*, 1–27. https://doi.org/10.1007/s10940-012-9192-8
von Neumann, J., & Morgenstern, O. (1944). *Theory of Games and Economic Behavior*. Princeton: Princeton Univ. Press.
Warr, M. (2002). *Companions in crime: The social aspects of criminal conduct*. Cambridge: Cambridge University Press.
Watts, T. W., Duncan, G. J., & Quan, H. (2018). Revisiting the marshmallow test: A conceptual replication investigating links between early delay of gratification and later outcomes. *Psychological Science*, *29*(7), 1159–1177.
Wertenbroch, K. (1998). Consumption self-control by rationing purchase quantities of virtue and vice. *Marketing Science*, *17*(4), 317–337.
Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, *30*(4), 669–689.
Wikström, P.-O. H. (2006). Individuals, settings, and acts of crime: Situational mechanisms and the explanation of crime. In P.-O. H. Wikström & R. J. Sampson (Eds.), *The explanation of crime: Context, mechanisms and development* (pp. 61–107). Cambridge, England: Cambridge University Press.
Williams, B. R., Bezner, J., Chesbro, S. B., & Leavitt, R. (2005). The effect of a behavioral contract on adherence to a walking program in postmenopausal African American women. *Topics in Geriatric Rehabilitation*, *21*(4), 332–342.
Wright, B. R. E., Caspi, A., Moffitt, T. E., & Paternoster, R. (2004). Does the perceived risk of punishment deter criminally prone individuals? Rational choice, self-control, and crime. *Journal of Research in Crime and Delinquency*, *41*(2), 180–213.

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