Received: 23 May 2018 | Revised: 1 October 2018 | Accepted: 3 October 2018

DOI: 10.1002/bsl.2388

RESEARCH ARTICLE

WILEY

Justice at any cost? The impact of cost–benefit salience on criminal punishment judgments

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This study investigated the effect of cost–benefit salience on simulated criminal punishment judgments. In two vignette-based survey experiments, we sought to identify how the salience of decision costs influences laypeople's punishment judgments. In both experiments (N_1 = 109; N_2 = 398), undergraduate participants made sentencing judgments with and without explicit information about the direct, material costs of incarceration. Using a within-subjects design, Experiment 1 revealed that increasing the salience of incarceration costs mitigated punishments. However, when costs were not made salient, punishments were no lower than those made when the costs were externalized (i.e., paid by a third party). Experiment 2 showed the same pattern using a between-subjects design. We conclude that, when laypeople formulate sentencing attitudes without exposure to the costs of the punishment, they are prone to discount those costs, behaving as if punishment is societally cost-free. However, when cost information is salient, they utilize it, suggesting the operation of a genuine, albeit labile, punishment preference. We discuss the implications of these findings for psychological theories of decision making and for sentencing policy, including the degree of transparency about the relevant costs of incarceration during the decision process.

1 | INTRODUCTION

Punishment is pricey. US taxpayers spend over $250 billion each year to incarcerate over two million offenders—more than any other nation (White House, 2016). The average cost of incarcerating a single inmate is over

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$30,000 per year, an amount that exceeds the average cost of college tuition (Henrichson & Delaney, 2012). These figures do not include the many collateral costs of incarceration, such as the adverse effects on the defendant's family and barriers to healthcare and job opportunities. The high cost of incarceration might not pose a problem if punishment outcomes were faithful expressions of our society's core values. But are punishment decisions so faithful, or are they vulnerable to influence by extra-legal factors, such as how the costs of incarceration are presented? Because sentencing policies and practices are supported by public opinion (Enns, 2014), an understanding of how laypeople formulate punishment attitudes and decisions is essential to the health of our correctional system and to the well-being of communities.

Social science research has established that human decision making under uncertainty is highly susceptible to bias. For example, when considering prospects with different costs and benefits, the way in which these costs and benefits are presented can strongly, albeit unconsciously, influence our choices, among both laypeople and experts (Caplan, 2001; Chakravarty, Harrison, Haruvy, & Rutström, 2011; Frederick, Novemsky, Wang, Dhar, & Nowlis, 2009; Giertz & Nardulli, 1985). Across different presentations, individuals are prone to make decisions that are highly suggestible, inconsistent, and, by some measures, irrational. In the context of criminal sentencing, such aberrations could have sweeping consequences for the health, safety, and stability of our communities. These considerations demand an understanding of how decision bias may impact support for government policies such as criminal sentencing.

A greater understanding of the impact of cognitive biases on sentencing attitudes can help scientists and legal practitioners identify strategies to counteract these biases and render decisions that are more consistent with stakeholders' considered preferences. The present study contributes to this effort by conducting a set of experiments designed to identify how the salience of decision costs and benefits influences sentencing attitudes and judgments.

1.1 | Background literature and study rationale

The hypothesis that sentencing decisions are influenced by the framing of the known costs and benefits is grounded in a rich literature on cognitive bias in decision theory (Kahneman & Tversky, 2000). Classical rational choice theories attempt to model economic decision making on the assumption that people seek to optimize decision outcomes by placing equal consideration on all relevant costs and benefits of a given choice. As such, consumer decisions tend to be more conservative as the cost of the good increases, a basic economic principle known as the law of demand. These theories also assume that consumer preferences are well-defined, meaning that they are consistent across a variety of contexts.

Behavioral economics and cognitive science research have challenged such assumptions. Most notably, prospect theory states that, rather than optimizing outcomes, people make decisions based on biased estimates of the relative value of the potential gains and losses of the decision (Kahneman & Tversky, 1979). Some of the cognitive devices that produce such biased estimates have already made a substantial footprint in the legal literature (see,e.g., Langevoort, 1998), and they help to form testable predictions about criminal punishment judgments.

First, the availability heuristic describes the tendency to make decisions based on whatever information happens to be immediately available in memory (Tversky & Kahneman, 1973). Importantly, the availability of information in memory may be heavily influenced by putatively irrelevant informational frames. A powerful demonstration of this effect is found in an experiment that asked legal professionals to roll a pair of dice before rendering a sentencing verdict for a mock trial. Participants who witnessed larger numeric outcomes on the dice inadvertently rendered longer sentences (Englich, Mussweiler, & Strack, 2006). In another mock trial experiment by the same authors, the sentencing decisions of real judges were unknowingly anchored by an inquiry from a journalist asking whether the sentence is likely to differ from “1 year” as opposed to “3 years” (Englich et al., 2006; see also Bennett, 2014). A plausible explanation for such effects is that increasing the salience of informational cues increases the relative accessibility of that information, in turn shaping attitude formation and change (Fazio, 1990).

Second, just as decision makers can overweight extraneous information, they can also underweight potentially relevant information. For example, research in business contexts has shown that, when reasoning about the costs and benefits of a costly decision, people tend to discount the decision's expected costs, including, for instance, the opportunities that were foregone in order to pay for the one that is selected (Becker, Ronen, & Sorter, 1974; Frederick et al., 2009; Hoskin, 1983; Jones, Frisch, Yurak, & Kim, 1998; Neumann & Friedman, 1978; Northcraft & Neale, 1986; Pontari, Stanaland, & Smythe, 2009; Vera-Muñoz, 1998). To our knowledge, such cost discounting has never been investigated in the context of criminal sentencing, where money that is spent on a prison sentence can no longer be used to invest in other government-funded programs such as policing, job training, healthcare, and other reentry services for former inmates.

Third, people tend to be less risk averse with resources they do not personally own or expect to own. One study, for example, found that individuals spend money more liberally when that money is gained by way of an unexpected windfall (e.g. winning the lottery) than when they expected to receive it (Arkes et al., 1994). Another study showed that people tend to be more risk tolerant when making decisions involving other people's money (Chakravarty et al., 2011).

These empirical observations suggest that, unless cost information is made salient, people may tend to discount these costs and "over-consume" a given resource. One potential explanation for such effects derives from coherence theory, which states that, as people move toward a decision, they will interpret and stretch the evidence in a way that enables them to maintain a coherent narrative about the decision they expect to make. Fact finders, thus, may privilege evidence that supports their narrative while discrediting evidence that opposes it, even if they previously rated all the evidence as ambiguous and unreliable (Cunliffe, 2014; Simon, 2004).

In criminal trials, the very structure of the task seems to favor some narratives over others. On the one hand, the task of formulating a punishment judgment is typically presented as an explicit goal—the conclusion of a rich, often emotional, narrative about a specific defendant and victim. Such individuating presentation formats have been shown to heavily influence decision making (Aarøe, 2011; Kogut & Ritov, 2005). However, while the benefits of criminal punishment take center stage, the societal costs of the punishment are relatively obscured and diffused across a large group of taxpayers. Indeed, judges, jurors, and the voting public are largely insulated from information about resourcing and from the many collateral consequences of sentencing felt by communities, offenders, and their families (see Mauer & Chesney-Lind, 2002). Thus, instead of considering the full spectrum of pertinent costs and benefits of the prospective punishment, fact finders are at risk of relying disproportionately on the most salient—usually most damning—characteristics of the crime. These considerations underscore the need to investigate the effects of cost disclosures on punishment judgments. More specifically, they raise the hypothesis that greater attention to sentencing costs could result in shorter sentences.

Despite the evidence supporting the notion that people making punishment judgments unwittingly discount the expected costs of incarceration, this topic remains vastly understudied in legal decision making contexts (Allyn, 2018). If people tend to discount sentencing costs during typical punishment judgments but utilize this information when it is more salient, then this discounting behavior could result in sentencing outcomes that systematically exceed those of judgments made under more transparent conditions. Therefore, it is important to know the conditions in which people are more or less responsive to such cost information during sentencing judgments.

One possible counterpoint, arising from research on sacred values, suggests that such factors might not easily change people's punitive attitudes if these attitudes are based on categorical moral principles (Aharoni & Fridlund, 2012; Berns et al., 2012; Tetlock, Kristel, Elson, Green, & Lerner, 2000). The prediction is that, all else equal, when sentencing decisions are based on strong moral values such as the need for retribution, no cost would be large enough to override such decisions—they are incommensurable (Tetlock, 2003).[1] Accordingly, research has shown

[1]This is not to say that retributive-minded people never take costs into account, only that the theory of retribution values costs only insofar as those costs serve *retrospective*, deontic ideals such as getting justice. This is in contrast to consequentialist theories of punishment, which value cost information in service of *prospective* goals, such as minimizing future harm (Packer, 1968).

that laypeople can be highly consistent in their criminal sentencing judgments when these judgments concern strong moral values (Koppel, 2018; Robinson & Kurzban, 2007). However, some research suggests that people may be less strict in protecting these sacred values when two or more such values are placed in direct conflict (Baron & Leshner, 2000). In either case, if laypeople's punishment judgments are in some ways insensitive to cost information, this would be an important discovery, particularly if such decisions result in net losses for taxpayers.

Logically speaking, funds not spent on punishment could be used to advance other competing values (including moral ones) held by that same individual, for example, to provide preventative services to people who are at risk of a criminal lifestyle. So how do we manage such conflicts? Scholars have theorized that people may have an implicit price point at which they are willing to trade off between competing values (Baron & Leshner, 2000; Tetlock, 2003). In such a case, it would be useful to know which sentencing price points are associated with the greatest preference change. The change in receptivity to different price points is known as price elasticity. Understanding the shape of the elasticity curve would reveal how much a given unit of punishment is "worth" to particular stakeholders. Evidence of a shift in cost sensitivity could also suggest the operation of competing cognitive strategies: a relatively automatic system that facilitates moralistic punishment, and a more effortful system that weighs expected costs and benefits of each alternative (Aharoni & Fridlund, 2013; Kahneman, 2011).

If attention to decision costs influences sentencing decisions, it is unknown whether this influence affects all participants equally. Understanding whether and how individual differences influence decision making within legal settings is important because such differences can illuminate the cognitive mechanisms underlying a given cognitive bias. Leading theories suggest that some cognitive biases are caused by a tendency to attend to the salient attributes of a problem and only access memories that are consistent with that interpretation, leaving the less salient attributes unattended (Levin, Schneider, & Gaeth, 1998). This tendency can improve decision making for well-defined problems but can overly constrain our ability to reason about more complex and abstract problems (Frensch & Sternberg, 1989). By this view, it seems to follow that people who excel in executive functions such as delayed gratification, counterfactual reasoning (i.e., the tendency to entertain multiple possible perspectives or outcomes), or emotion regulation (i.e., the tendency to control one's emotional reactions to affective stimuli) should exhibit less susceptibility to such biases because they should be better able to attend to and incorporate factors relevant to their decision regardless of its salience. Yet support for this hypothesis is mixed, as other research suggests that individuals with high cognitive ability or subject-matter expertise are no less susceptible to many cognitive biases and may even be more susceptible in some cases (Bennett, 2014; Vera-Muñoz, 1998; West, Meserve, & Stanovich, 2012). Further research is needed to understand the extent to which sentencing decisions are affected by executive function abilities.

By design, judicial sentencing decisions and the money that funds these decisions are ultimately based on and accountable to the opinions of voters and taxpayers. This study sought to fill a critical gap in the psychology and law literature by identifying subtle drivers of punishment judgments, including some contextual regularities and implicit preferences that are likely to shape public opinion about punishment. In two survey experiments, we tested the hypothesis that recommended punishments will be lower when the direct material costs of incarceration are explicit compared with when they are unspecified (i.e., no cost information) or indirect (putatively paid for by external sources rather than by taxpayers). In Experiment 1, we tested this hypothesis using a within-subjects design to capture change in individual attitudes as costs increase. In Experiment 2, we replicated Experiment 1 using a between-subjects design with random assignment to eliminate the possibility of carry-over effects. Individual differences were also assessed.

Evidence that public opinion may be responsive to how sentencing cost–benefit information is framed could stimulate public discourse on best practices for sentencing policies, which currently do not emphasize sentencing costs. Evidence contrary to this hypothesis—that the public is not responsive to cost information—would be equally important because it would suggest that, collectively, our punitive values may be so resolute that we as a society are willing to bear indefinitely large costs to maintain them.

2 | EXPERIMENT 1

2.1 | Methods

2.1.1 | Participants

Participants consisted of 114 undergraduate psychology students recruited through Georgia State University Psychology department's online subject pool. All identified as US citizens over the age of 18. Seven were excluded for failing to complete the survey. Two were excluded for failing the attention/knowledge check ("What are the colors of the American flag?"). The remaining 105 were 70.2% female, 27.9% male; 16.2% Hispanic or Latino, 43.8% White/Caucasian, 32.4% Black or African American, 24.8% Asian, 10.5% mixed, 6.7% other/unknown (as per NIH standards, ethnic and racial categories were non-exclusive). Participants received course credit for participating in the study.[2]

2.1.2 | Design

This experiment utilized an ecologically realistic decision task adapted from the Choice Modeling framework (Morikawa, Ben-Akiva, & McFadden, 2002). The task presented a hypothetical criminal case summary, followed by a series of questions. (See the appendix for study instructions and vignette text.) A within-subjects design was employed to investigate individual changes in preferences while controlling for other individual-level differences. The pre-test was defined as the baseline sentencing judgment, absent any information about decision costs (i.e., the pre-cost condition). The sentencing options presented were on a scale from 0 to 10 years.[3] The post-test was defined as the change in sentence following each level of the cost manipulation (see Section 2.1.4 for scale labels). We also calculated a sentencing cost discounting slope, which represents the unit of change in sentence for the different levels of cost.

In an attempt to benchmark the punishment responses, the same participants were later asked how their initial sentence might differ if the incarceration costs were externalized, namely, paid by third-party donors rather than by taxpayers. In this externalized cost scenario, no dollar amount was stated, only that taxpayers would pay zero. We reasoned that, to the extent that punishments are motivated by rational self-interest, they should be greatest (i.e., least constrained by cost information) when there is no direct cost to taxpayers. This question, despite its limited ecological validity, was included to help interpret the results of our pre- versus post-cost comparison. Specifically, if pre-cost punishments differ from post-cost punishments but look more like those stipulated to be paid by third parties than by taxpayers, this would be consistent with the interpretation that pre-cost punishments are less rational because it would imply that participants who later utilized cost information when it was salient were not considering any personal costs at all when it was less salient. Importantly, the late position of this question increases its susceptibility to carry-over effects from the previous questions. Nonetheless, we include it in Experiment 1 for exploratory purposes, and address its limitations in Experiment 2.

2.1.3 | Hypotheses

H1. Our primary hypothesis is that sentences that follow presentation of direct cost information (post-cost sentences) will be more lenient than those in the pre-cost condition. This prediction is based on the view that people,

[2]All study procedures were approved by the university's ethical review board and conditioned on informed consent.

[3]The distributions for the sentencing scales across studies violated the assumption of normality. However, given the robustness of the ANOVA method to these violations, and given known issues in data transformation, we elected to model them in raw form following Schminder, Ziegler, Danay, Beyer, and Bühner (2010).

especially during moral decisions, are likely to discount the costs of a good unless those costs are made salient by an external cue. However, pre-cost sentences should be no more lenient than externalized-cost sentences.

H2. A secondary prediction is that lower executive function scores will predict greater increases in punishment when the direct costs are unspecified. This prediction is based on the view that people with lower executive function will have more difficulty incorporating relevant information when that information is low in salience.

2.1.4 | Materials and procedures

A case summary vignette described a (fictitious) felony case of home invasion. (See the appendix for study stimuli.) Immediately following the vignette, the baseline dependent measure was delivered, asking participants to indicate how much the offender should be punished on a ratio slider scale from 0 to 10 years in prison, numbers chosen to be roughly commensurate with many state sentencing schemes. Following the baseline measure, the cost manipulation was delivered, which, under the guise of a newly published government report, stipulated the actual average US cost of incarceration per year ($30,000), and estimated the average per-taxpayer cost for a given state ($200). It also described a plausible opportunity cost, namely funding that could otherwise be spent on job training for individuals at risk. Participants were given unlimited response time.

Following presentation of cost information, participants were given an opportunity to adjust their initial sentence recommendation in light of this new information. After this post-test measure, several additional sentencing recommendations were collected for an identical crime in response to new hypothetical cost values that increased from $30,000 in nine ascending equal increments of $30,000. This scale enabled us to determine whether, when, and how much participants sought to change their sentencing preferences as a function of cost size. Finally, to assist in the interpretation of cost sensitivity, participants were asked to make one final sentence recommendation under the assumption that prison costs would be paid exclusively by private sources and not by taxpayers, regardless of the cost.

Executive functioning was measured in three ways: a delayed discounting task, a scale to measure counterfactual reasoning, and an emotion regulation scale. The Delayed-Discounting Questionnaire (DD) measured participants' willingness to delay remuneration by asking "would you rather redeem [X] dollars immediately or [X+n] dollars in one year?". It is a commonly used measure of delayed discounting (Kirby & Maraković, 1996), and methods have been independently established to calculate a subject-level hyperbolic discounting parameter (Hardisty & Weber, 2009). Larger numbers indicate a preference for immediate gratification. Our sample mean in the present study was 0.23 (0.02) out of an observed range of −0.16 to +0.64. This score indicates that getting $250 now was roughly equivalent to getting $307.50 a year from now. It suggests a slightly greater preference for delay than the reference sample reported in the Hardisty and Weber study.

Counterfactual reasoning was assessed using the Counterfactual Thinking scale (CFT) developed by Stanovich and West (1997). Counterfactual reasoning refers to one's capacity to "decenter" and "adopt alternative perspectives" (pp. 349, 352). The scale has two items: "My beliefs would not have been very different if I had been raised by a different set of parents" and "Even if my environment (family, neighborhood, schools) had been different, I probably would have the same religious views" (p. 347) on a Likert-type scale from 1 (disagree strongly) to 6 (agree strongly). This scale has achieved high reliability (p. 348).

Emotion regulation is the ability to control one's emotional experiences. This was assessed using the 18-item short-form version of the Difficulties in Emotion Regulation Scale (DERS-SF), a widely used and well-validated measure (Kaufman et al., 2015). It includes items such as "When I'm upset, I have difficulty concentrating" and "I pay attention to how I feel," measured on a Likert-type scale from 1 (almost never) to 5 (almost always). The total score is out of 74.

Several additional self-report measures were administered to assess belief in the manipulations, endorsement of five common punitive motives (Nadelhoffer, Heshmati, Kaplan, & Nichols, 2013), and demographic information such as gender, and political ideology on a slider scale from "very liberal" to "very conservative". We also assessed self-reported mathematical ability ("Compared to my peers, my mathematical ability is" (1) below average, to (7) above

average) on grounds that people with greater difficulty in mathematical reasoning might be more susceptible to cost discounting because of difficulty conceptualizing relevant costs and benefits (see Slovic, 2010).

2.2 | Results

2.2.1 | Cost discounting

H1. (a) Were sentences that followed presentation of cost information more lenient than those under pre-cost conditions? (b) Did pre-cost sentences differ from externalized-cost sentences?

In a first step to address H1(a), a repeated-measures ANOVA was used to test the linear rate of change from pre-cost to post-$30k cost. Exposure to all cost information was associated with a large (53.2%) reduction in punishment by *MD* = 1.42 years, $F(10, 1040) = 30.55$, $p < .001$, partial $\eta^2 = .227$. The steepest rate of change (*MD* = 0.54 years) occurred in the first interval, suggesting a disproportionate (20.2%) reduction in sentencing from pre- to post-$30k, $B = 2.12$, $p < .001$, with diminishing marginal returns at the higher cost levels.

One limitation of ANOVA, however, is that it is not well-suited for non-linear data with mixed effects. To overcome this limitation, we constructed separate linear and quadratic mixed effects models using the *lme4* package (Bates, Maechler, & Bolker, 2012) in R (R Core Team, 2016). We included pre- and post-cost conditions as the fixed effects and participant identifier as a random effect to account for different baseline rates in sentencing. For the quadratic model, we additionally included a quadratic term for post-cost condition to account for the possibility of variable reductions in punishment for incremental cost increases. We also fitted a null model, containing only the intercept and the random effect. We used likelihood ratio tests to assess whether cost condition significantly improved model fit over this reduced model and whether the quadratic model improved fit over the linear model. We used the restricted maximum likelihood (REML) approach for parameter estimation; *p*-values were calculated based on Satterthwaite approximated degrees of freedom obtained with the lmerTest package (Kuznetsova, Brockhoff, & Christensen, 2017).

The linear model fit the data better than the null model, indicating that introduction of cost information decreased sentences, $\chi^2(2) = 232.99$, $p < .001$. Although both models were significant, our data best fit the quadratic model, $\chi^2(1) = 7.93$, $p = .005$, $r^2 = .076$. (See Table 1 and Figure 1.)

Descriptively, the ability to assign some amount of punishment appeared to yield very high subjective utility. Specifically, participants on average supported a minimum of about one year of prison even at the highest (fictitious) cost level of $300,000. This pattern reflects a strong insensitivity to variation in cost for the first year. However, there were diminishing marginal returns of additional prison time, which was strongly discounted at the $30k level (i.e., the true average annual cost of incarceration), at least for the sample as a whole.

An examination of group differences revealed a sizeable sub-group of participants who, descriptively speaking, appeared wholly unswayed by cost information. Specifically, 19.1% of participants persisted in their original pre-cost sentence (*M* = 2.68, *SD* = 2.12) or greater, even at the highest cost level. Conversely, a substantial 23.8% of the

TABLE 1 Results of linear and quadratic mixed models with random intercepts, indicating significant negative slopes

		Linear mixed model		Quadratic mixed model	
Random effects	**Group**	**Variance**	**SD**	**Variance**	**SD**
	ID	1.57	1.26	1.58	1.26
	Residual	0.47	0.69	0.47	0.68
Fixed effects		**Coefficient (SE)**	***T*-value (*p*-value)**	**Coefficient (SE)**	***T*-value (*p*-value)**
	Intercept	0.49 (0.20)	2.40 (.018)	0.67 (0.21)	3.13 (.002)
	Pre-cost	0.61 (0.06)	10.56 (< .001)	0.61 (0.06)	10.56 (< .001)
	Cost	−0.96 (0.07)	−13.01 (< .001)	−1.86 (0.33)	−5.68 (< .001)
	$Cost^2$	—	—	0.82 (0.29)	2.82 (.005)

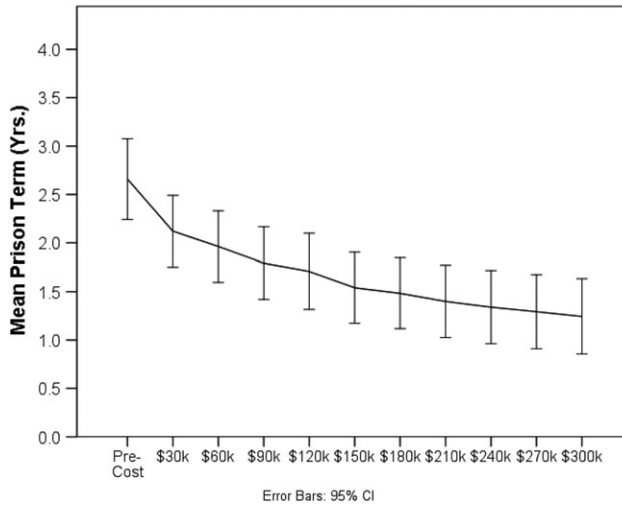

FIGURE 1 Change in recommended prison time as a function of explicit cost information. Pre-cost sentences were significantly longer than post-cost ($30k) sentences, $p < .001$

sample chose to forgo all punishment at this cost level. That is, they converted from a non-zero sentence recommendation to zero months by the final cost tier—though many of these individuals revealed narrower conversion thresholds (e.g., about 10% of the sample abstained from all punishment by the $120k price point). We found no difference in punitive motives, attributions of responsibility, or political ideology between those who persisted and those who abstained from all punishment at high cost levels.

To address H1(b), we asked whether pre-cost sentences differed from $30k and externalized-cost sentences. Using an ANOVA with these three cost types as predictors, a main effect of cost salience on sentence length emerged, $F(2, 208) = 6.61$, $p = .002$, $\eta^2 = .060$. According to pairwise comparisons using Fisher's least significant difference (LSD) test, pre-cost sentences ($M = 2.66$; 95% CI [2.24, 3.08]) were significantly (over 29%) longer than post-cost sentences of $30k ($M = 2.21$, 95% CI [1.75, 2.49], $p < .001$). Interestingly, pre-cost sentences were also more severe than externalized-cost sentences ($M = 2.10$; 95% CI [1.63, 2.57], $p = .003$). Post-$30k sentences, in contrast, were not significantly different from externalized-cost sentences, contrary to expectation, $p = .92$. This pattern suggests that, anytime costs were mentioned, sentences decreased regardless of who would bear those costs. While this could indicate that people simply ignored costs that were not salient, it may also reflect an order effect (the externalized-cost condition followed the post-cost condition).

2.2.2 | Executive functioning

H2: Did decreasing executive function scores predict greater increases in punishment when the direct costs are unspecified?

To test whether executive function scores moderated the effect of cost salience on sentencing judgments, separate repeated measures ANOVAs were conducted with pre-/post-cost punishment as a within-subjects factor and delayed discounting (DD; $M = 0.22$, $SD = 0.02$), counterfactual thinking (CFT; $M = 3.51$, $SD = 0.13$), and difficulties in emotion regulation (DERS; $M = 39.82$, $SD = 1.22$) scores as covariates. However, none of these scores exhibited moderating effects. Specifically, DD did not impact sentences either directly, $F(1, 99) = 0.05$, $p = .827$, or interactively with cost type, $F(2, 198) = 1.54$, $p = .216$. CFT did not exert a main effect, $F(1, 103) = 1.26$, $p = .265$, or interactive effect, $F(2, 206) = 0.85$, $p = .428$, with cost type on sentence length. Neither did DERS total score exert a main effect, $F(1, 102) = 0.02$, $p = .887$, or interactive effect, $F(2, 204) = 0.30$, $p = .741$, with cost type on sentence length.

Notably, the power for all three interaction tests was quite low ($1 - \beta < .40$), so the failure to detect executive function effects could be the result of our small sample size.

2.2.3 | Additional analyses

Our hypothesis tests suggest that participants were responsive to cost information, but only when it was explicit at the time of decision. This pattern is suggestive of a cost discounting effect whereby recommended punishments are relatively inflated when direct costs of incarceration are unspecified. One explanation for this effect is that most people do not know that prison budgets are funded primarily by taxes, so when they reduce sentences in the direct cost conditions this reflects a rational response to learning that sentencing expenditures directly affect them. To test this knowledge, participants were asked, using a multiple choice format, where funds for prison budgets ultimately come from. The vast majority (89.8%) of people correctly indicated that prison budgets are typically funded by taxes, $X^2(3) = 234.24$, $p < .001$. However, the cost discounting effect was observed despite this prior fiscal knowledge.

A similar explanation for the cost discounting effect is that most people lack background knowledge about the substantial costs of prison, and when they are educated about these costs they respond rationally by reducing their sentencing recommendation. To test whether the observed cost discounting effect can be explained by such a lack of knowledge, we asked participants whether they thought a true prison cost of $30,000 was more than, less than, or about equal to what they expected a year of prison to cost. About half the sample (51.4%) stated that $30,000 was more than they expected, $X^2(3) = 42.09$, $p < .001$. Thus, a lack of relevant fiscal knowledge is a plausible explanation for the observed effect. Nonetheless, when we conducted our primary hypothesis test, H1(a), with these individuals excluded, a marginally significant effect of cost still held, whereby post-cost sentences ($M = 2.37$, 95% CI [1.74, 3.00]) tended to be more lenient than pre-cost sentences ($M = 2.68$, 95% CI [2.04, 3.32], $p = .003$), $F(2, 100)$, 2.56, $p = .082$. Thus, the effect of cost salience is likely not limited to those who had initially believed the cost of incarceration to be relatively low. In other words, it is not fully explained by a mere lack of relevant fiscal knowledge.

Was the reductive effect of cost on sentencing recommendations associated with political ideology? Using a self-report scale from −3 (very liberal) to 3 (very conservative), a Pearson correlational analysis did not detect a significant association between political ideology ($M = -0.79$, $SD = 1.33$) and sentencing for the pre-cost, $r = .07$, $p = .522$, post-cost, $r = .16$, $p = .111$, or external cost conditions, $r = -0.09$, $p = .389$. Moreover, there was no significant relationship between political ideology and the difference in sentencing for the pre- and post-$30k cost conditions, $r = -0.16$, $p = .118$. Given the modest prevalence of conservatives in our sample (30 participants, or 28.6%), however, the failure to observe an association with political ideology could potentially be due to low statistical power. Indeed, when coded into discrete groups, inspection of the means suggests that conservatives showed a tendency to assign longer sentences than liberals for pre-cost ($MD = 0.75$) and post-30k cost ($MD = 0.96$) conditions, yet these conservatives' pre/post change in sentence was more shallow ($MD = 0.41$) than that of the liberals ($MD = 0.62$), descriptively speaking.

Was the reductive effect of cost information on sentencing recommendations associated with self-reported mathematical ability? Scores for math ability ranged on a scale from −3 (below average) to 3 (above average). Pearson's correlations found no significant relationship between math ability ($M = 2.87$, $SD = 13.60$) and sentences in the pre-, $r = .02$, $p = .811$, post-, $r = -0.03$, $p = .777$, or external cost conditions, $r = .05$, $p = .589$. Moreover, there was no significant relationship between the difference in punishment for the pre- and post $30k cost conditions and self-reported math ability, $r = .10$, $p = .314$. Thus, self-reported math ability is not likely to explain the observed cost-related changes in punishment.

We also examined participants' explicit opinions about whether judges should consider (a) the monetary costs of the sentence or (b) other potential uses of the funds before deciding how much an offender should be sentenced. On a scale from −3 (strongly disagree) to +3 (strongly agree), responses did not differ from the neutral point for monetary

costs, $M = 0.05$, 95% CI [−0.29, 0.39], $t(103) = 0.28$, $p = .781$, or for other uses of the funds, $M = 0.16$, 95% CI [−0.18, 0.50], $t(103) = 0.95$, $p = .344$. In context with the results of Hypothesis 1, this suggests a discrepancy between participants' explicit opinions about the appropriate role of cost information in judicial decisions and how cost information actually influenced their own sentencing judgments in the task.

2.3 | Discussion

Experiment 1 demonstrated that, under default (pre-cost) conditions, when the material costs of incarceration are not made salient, participants rendered sentencing judgments that were 20–53% more severe than those under cost-salient conditions. This pattern suggests that participants heavily discounted cost information when it was inconspicuous but were rationally responsive to that information when it was explicit. In fact, we observed somewhat of a dose–response relationship between cost and punishment, wherein increasing levels of cost exerted incremental sentence reductions. The largest drop in sentences occurred within the first increment.[4] However, this pattern of leniency plateaued above zero, suggesting a qualitative change in willingness to pay for punishment across cost levels. This change is consistent with a proportional shift between a rational strategy that weighs costs and benefits and a categorical strategy to protect sacred values.

To the degree that these punishment judgments are rationally motivated, one might expect the largest sentences under conditions in which the cost is incurred by a third party, because these punishments are materially cost free from the taxpayer's perspective. Yet pre-cost sentences were no less severe than those in the externalized cost condition—in fact they were more severe. However, interpretation of this effect is qualified by the fact that punishments in the externalized condition were no greater than those in the post-$30k condition. Rather, anytime prison costs were stated, sentences decreased regardless of who would bear those costs. In addition, our design was susceptible to a potential confound in the order of presentation, such that costs had already been made salient by the time participants were asked about the externalized costs. We rule out this possibility in Experiment 2 using a between-subjects approach.

The cost-discounting effect is not well explained by a lack of knowledge about how correctional budgets are funded, namely by taxpayers. Nor is it well explained by participants' explicit attitudes about whether judges ought to consider material costs of incarceration, since these attitudes did not track their own behavior. The effect could be explained partially, but not exclusively, by a lack of knowledge about the sheer magnitude of the cost of incarceration.

Finally, none of the measures of executive function moderated the effect of cost on punishment recommendations. However, this could be due to insufficient power to detect true effects, as demonstrated, or by the medium (online survey), which is not as conducive to executive function tests as in-person studies. Given the substantial individual differences that we saw among our participants, we think that this topic is important for future exploration to understand what, if any, cognitive features are linked to differences in decision making about incarceration.

Like all studies, this study was necessarily limited by its choice of design. Within-subjects designs are well suited to demonstrate preference changes within individuals—our primary quantitative measure for this study. However, these designs are also vulnerable to demand characteristics such as carry-over effects that could contaminate repeated measures and reduce their face validity. To address this limitation, we attempted to reproduce our key results using a between-subjects cost comparison in Experiment 2.

[4]We caution against over-interpretation of effect sizes for mixed effects models because conventional criteria for interpretation have not been established. However, evaluation of the linear effects of our primary hypothesis tests indicate effect sizes in the medium range, according to Cohen's conventional criteria (Cohen, 1988).

3 | EXPERIMENT 2

3.1 | Methods

3.1.1 | Participants

Four hundred and forty participants consented to this survey. All were undergraduate students recruited through two Georgia State University online subject pools, participating for course credit. All identified as US citizens over the age of 18. Fifty-one percent were recruited from an introductory psychology course, and 49% from an introductory political science course. Both courses included a mix of academic majors. The two samples did not statistically differ in any of several demographic variables (gender distribution, age, political ideology, or household income), so we elected to pool them into a single sample for statistical analysis. The large size of this sample afforded the opportunity to uphold stricter exclusion criteria to ensure that participants were adequately attentive and engaged in the survey. We excluded 47 participants for failure to complete the survey, 8 for failing the attention/knowledge check ("What are the colors of the American flag?"), 9 for taking too much time to the complete the survey (>2 SD above mean of 22.74 min.), 69 for failing to identify on a list the type of crime presented, and 78 for failing to remember the specified cost information. The remaining 229 participants were 76.0% female, 23.6% male; 11.8% Hispanic or Latino, 35.8% White/Caucasian, 46.3% Black or African American, 18.3% Asian, 7.0% Mixed, 3.5% preferred not to answer, and 4.8% other/unknown.

3.1.2 | Design

This experiment employed a 4 cost type (unspecified, externalized, $31k, $101k) between-subjects design with random assignment to conditions.[5] Punishment judgments were measured in two ways: a qualitative nine-point scale from "minimum allowable" to "maximum allowable" (but with no other labels or tick marks), and the quantitative prison sentencing scale used in Experiment 1.

3.1.3 | Hypotheses

H1. Punishments will be more lenient in the direct cost conditions than in the unspecified- and externalized-cost conditions. However, punishments in the unspecified cost condition will be no lower than those in the externalized cost condition.

H2. Decreasing executive function scores will predict greater increases in punishment when the direct costs are unspecified.

3.1.4 | Materials and procedures

The procedures were similar to those in Experiment 1. A case summary described a (fictitious) criminal convenience store robbery in which the cashier was injured. (See the appendix for study stimuli.) Immediately following the vignette, the manipulated cost information was presented. We administered the same executive function measures as reported in Experiment 1.

[5]The $31k cost is increased slightly from Experiment 1 to more closely approximate the average annual per-inmate cost of incarceration estimated by Henrichson and Delaney (2012).

3.2 | Results

3.2.1 | Cost discounting

H1. (a) Were punishments in the direct cost conditions more lenient than those in the unspecified-cost condition? (b) Did punishments when costs were unspecified differ from those when costs were externalized?

3.2.2 | Qualitative punishment measure

We tested our hypothesis using an ANOVA with four independent groups (unspecified cost, externalized cost, $31k cost, $101k cost) for each punishment measure, beginning with the qualitative measure. There was a main effect of cost condition on qualitative punishment, $F(3, 225) = 4.87$, $p = .003$, $\eta^2 = .061$. Pairwise comparisons revealed that punishment ratings in the $31k condition ($M = 3.13$, 95% CI [2.68, 3.58]) were significantly more lenient than those in the unspecified cost ($M = 3.96$, 95% CI [3.49, 4.43], $p = .013$) and externalized cost ($M = 3.86$, 95% CI [3.34, 4.38], $p = .038$) conditions. Similarly, punishment ratings in the $101k condition ($M = 2.88$, 95% CI [2.40, 3.35]) were significantly more lenient than those in unspecified ($p = .002$) and externalized ($p = .006$) cost conditions. However, as expected, these latter two conditions did not differ from one another ($p = .777$). No differences in punishment were evident between the $101 k and $31 k conditions ($p = .448$). (See Figure 2.)

3.2.3 | Quantitative punishment measure

In a separate four-groups ANOVA, we found a main effect of cost condition on the quantitative sentence rating, $F(3, 225) = 6.76$, $p < .001$, $\eta^2 = .083$. Pairwise comparisons again revealed more lenient sentences in the $101k condition ($M = 1.62$, 95% CI [1.12, 2.12]) relative to the unspecified cost ($M = 3.23$, 95% CI [2.73, 3.73], $p < .001$) and externalized cost ($M = 2.47$, 95% CI [1.92, 3.02], $p = .026$) conditions, but, as expected, sentences in the unspecified cost condition were no lower than those in the externalized condition; in fact, they were marginally more severe ($p = .044$). Sentences in the $31k condition ($M = 2.40$, 95% CI [1.92, 2.87]) were also significantly more lenient than

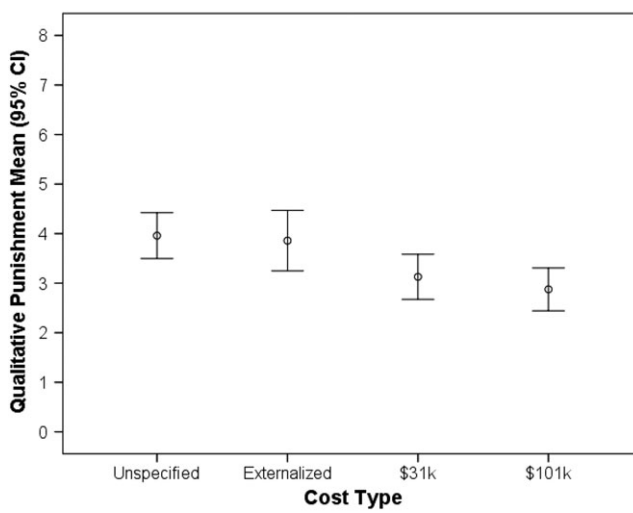

FIGURE 2 Differences in recommended punishment as a function of cost type. Qualitative punishment ratings in the unspecified and externalized conditions were significantly greater than those in the $31k and $101k cost conditions (all $p < .05$). No other differences were observed

in the unspecified cost condition (p = .018), though this pattern did not extend to the externalized cost condition (p = .843). Sentences in this model were also lower in the $101k condition than the $31k condition ($p$ = .028).

In summary, when participants were assessed using a qualitative punishment scale, both components of Hypothesis 1 were fully supported. This pattern was in large part reproduced using the quantitative sentencing scale, wherein sentences were more lenient when the direct costs were specified as opposed to unspecified. Further, participants punished less when the costs would be incurred by taxpayers as opposed to third parties, especially for the larger $101k amount. When costs were unspecified, however, these punishments were no less than—and perhaps even greater than—those made under externalized conditions.

3.2.4 | Executive functioning

H2. Were executive function scores negatively associated with punishment when the direct costs were unspecified?

We found no impact of executive function scores on punishment. First, we employed multiple regression analysis to examine whether counterfactual thinking moderated the effect of cost type on prison sentences (Model 1) or qualitative punishment (Model 2) using "direct cost" as the reference category.[6] Although both overall models were significant, $F(5, 223) = 4.06$, $p = .002$ and $F(5, 223) = 3.05$, $p = .011$, there were no moderating effects of CFT score on punishment. Specifically, for the prison sentence measure, $F(5, 223) = 4.06$, $p = .002$, $R^2 = .08$, $\Delta R^2 = .08$, CFT was not found to interact with unspecified cost, $t(223) = 1.75$, $p = .082$, or externalized cost, $t(223) = -0.26$, $p = .796$, relative to direct cost. For the qualitative punishment measure, $F(5, 223) = 3.05$, $p = .011$, $R^2 = .06$, $\Delta R^2 = .06$, we also found no interactive effects of CFT with unspecified cost, $t(223) = 1.04$, $p = .298$ or externalized cost, $t(223) = -0.93$, $p = .353$.

Similar regressions were conducted to examine the interaction of cost type and emotion regulation on both punishment measures. Again, both overall models were significant, $F(5, 223) = 3.26$, $p = .007$, $R^2 = .07$, $\Delta R^2 = 0.05$ and $F(5, 223) = 2.84$, $p = .017$, $R^2 = .06$, $\Delta R^2 = .04$, but DERS score did not interact with unspecified cost, $t(223) = -0.03$, $p = .975$ and $t(223) = -0.03$, $p = .975$, or externalized cost, $t(223) = 0.96$, $p = .336$ and $t(223) = 0.52$, $p = .603$, for prison time or qualitative punishment, respectively.

Next, we examined whether differences in the tendency to discount the future interacted with cost type in determining prison time or qualitative punishments. Again, although the overall models were significant, $F(5, 216) = 2.91$, $p = .021$ and $F(5, 216) = 2.60$, $p = .026$, no interactions with cost type were observed for unspecified cost, $t(216) = 0.47$, $p = .639$ and $t(216) = 0.18$, $p = .860$, or externalized cost, $t(216) = 0.06$, $p = .949$ and $t(216) = -0.60$, $p = .547$, for either measure.

3.2.5 | Additional analyses

First, we sought to assess participants' awareness that their punishment determinations might have been influenced by cost information. They were asked "Do you think you would have assigned longer sentences to Mr Jones if the funds to incarcerate offenders were unlimited?" We reasoned that if responses to this question were disproportionately negative, yet sentencing recommendations in the unspecified and externalized cost conditions were relatively large, then this incongruity would suggest that participants might not have been consciously aware that they increased their recommended sentences under these conditions. We found that, across conditions, a minority of participants granted that unlimited funds might have evoked longer sentences (11.8%) or were unsure (25.3%), but most participants (62.9%) reported that unlimited funds would not have evoked longer sentences, $X^2(2) = 96.27$, $p < .001$,

[6]To guard against model overspecification, the two direct cost variables ($31k and $101k) were additively combined into a single "direct cost" variable for the regression models. Even so, all regressions showed evidence of overspecification by virtue of high multicollinearity. In response, reduced models that excluded the externalized cost factor were also utilized, but did not change the overall pattern of results.

suggesting a lack of insight about its true influence. People in the unspecified and externalized conditions were disproportionately affected, with 79.7% and 75.5%, respectively, denying that unlimited funds would have increased their sentences, compared with 43.8% in the $31k and 56.9% in the $101k condition denying this possibility, $X^2(6) = 23.99$, $p < .001$.

We also probed fiscal knowledge by asking participants where funds for prison budgets ultimately come from. As with Experiment 1, the majority (91.27%) of participants recognized that prison budgets are funded by taxes, $X^2(3) = 537.87$, $p < .001$. Similarly, participants were asked how much they thought it actually costs to incarcerate a single inmate for one year in the USA, among six intervals of $20,000 from $0 to $200,000. Here, 38.0% of participants selected the response that encompassed the correct US average, and 12.2% selected a lower response range. If people in the unspecified cost condition recommended harsher punishments simply because they mistakenly believed the costs of incarceration were lower than they actually are, then their cost estimates should, likewise, be lower than those of their counterparts in the $31k cost condition. However, their cost estimates (M = 1.80, 95% CI [1.48, 2.12]) were no lower than those in the $31k cost condition ($M$ = 1.44, 95% CI [1.13, 1.74], p = .111). Moreover, when the "low-cost estimators" were excluded from the hypothesis test, the effect of cost group on punishment recommendations remained for both the qualitative scale, $F(3, 197) = 4.38$, p = .005, and the quantitative punishment scale, $F(3, 197) = 7.32$, $p < .001$. Specifically, qualitative and quantitative punishments were significantly lower in the $31k cost condition ($M$ = 3.15, 95% CI [2.67, 3.62]; M = 2.38, 95% CI [1.89, 2.87]) than the unspecified cost condition (M = 4.05, 95% CI [3.52, 4.57], p = .013; M = 3.36, 95% CI [2.82; 3.91], $p < .001$). Even those who correctly identified the true costs of incarceration showed a punishment pattern consistent with cost discounting. Thus, as in Experiment 1, the observed cost discounting effect cannot be fully explained by the belief that the costs of incarceration are lower than they actually are.

Again, participants were asked about the extent to which judges should consider the monetary costs of the sentence before deciding how much an offender should be sentenced. As in Experiment 1, attitudes did not differ from the neutral point either for monetary costs, $M = -0.02$, 95% CI [−0.25, 0.20], $t(228) = -0.19$, p = .849, or other uses of the prison budget, M = 0.15, 95% CI [−0.08, 0.39], $t(228) = 1.32$, p = .189.

Finally, we examined whether the effect of cost on sentencing was associated with political ideology. Using a multiple linear regression with cost type, political ideology, and their interaction, no moderation effects were observed. Although the overall model was significant, $F(5, 207) = 3.83$, p = .002, and the zero-order correlation between conservatism and sentencing was positive, r = .11, p = .049, political ideology did not moderate the effect of cost type on sentences for direct < unspecified costs, $t(207) = 0.73$, p = .464, or direct < externalized costs, $t(207) = -0.81$, p = .419.

3.3 | Discussion

The results of Experiment 2 paralleled those of Experiment 1, namely that increasing direct cost salience mitigated punishments relative to conditions under which the costs were not specified. The size of the effect was medium according to Cohen's criteria (Cohen, 1988). Support for the prediction about punishment under externalized costs was less consistent and depended on the way in which punishment was measured, but, as expected, punishments under the unspecified cost condition were no lesser, and possibly greater than, those under the externalized cost condition. Taken together, this study shows that the predicted cost discounting effect is not a mere artifact of the within-subjects design or the particular crime scenario employed in Experiment 1.

A secondary goal of Experiment 2 was to examine whether particular individual difference variables, particularly measures of executive function, moderate the effect of cost type on punishment judgments. However, no such effects were observed. These null results are consistent with Experiment 1, suggesting either that our measures are ill suited to capture these constructs or that any effects of these variables are small or absent. Again, these studies

were conducted in an online environment, which has previously proven amenable to exploring the effects of executive function (Hicks, Foster, & Engle, 2016), but we may nonetheless obtain different results in a laboratory with more traditional executive function measures.

4 | GENERAL DISCUSSION

In this study, we sought to understand how laypeople manage conflicting values about punishment, with the goal of better understanding how cost information would impact real-world decisions about incarceration of individuals convicted of crimes. Currently in the USA, punishment decisions are typically made in a price vacuum, but if people do not spontaneously recognize opportunity costs, it becomes important to know if they would make different decisions when the material tradeoffs between incarceration and other uses of taxpayer dollars are made salient.

Our two experiments reveal three core findings: (1) under default conditions, as predicted, laypeople discount prison costs when formulating punishment judgments in the absence of any explicit cost information; (2) these default punishments are at least as large as those made under conditions where the punishment was stipulated to be cost-free to taxpayers, indicating that, without explicit prompting, participants were not considering costs when making incarceration decisions; but (3) when cost information is made explicit, these punishments are substantially reduced relative to both no-cost and cost-free conditions, indicating that, under these conditions, people's punishment preferences are relatively elastic. Moreover, participants did not appear to be particularly aware of their tendency to punish less when costs are salient, as reflected by the sentiment that they would not have assigned longer sentences if the funds to incarcerate offenders were unlimited.

Our overall pattern of results was demonstrated consistently across two crime types and across different (within- and between-subjects) design types, allowing us to demonstrate within-subject changes in punishment while also ruling out carry-over effects and other demand characteristics inherent to within-subjects designs. Together, these results suggest that, when the costs of incarceration are inconspicuous, people behave as if prison terms grow on trees, but when costs are made salient, people are prepared to treat prison sentences like any other elastic commodity.

One potential explanation for these findings is that people are responding rationally to substantive changes in information. That is, lacking accurate cost information, people still consider the costs, but do so using what might be a lower imagined dollar value. In this view, cognitive bias plays no role. Our studies cannot completely rule out this possibility since we do not know participants' initial beliefs about the costs of incarceration. However, our pattern of results makes this explanation seem incomplete, because if people in the unspecified condition factored (lower) costs into their punishment judgments, these punishments should have been lower than those made when the punishment was stipulated to be personally cost-free. Moreover, the vast majority of participants demonstrated that they were aware that tax dollars funded incarceration. Yet our participants as a whole—and specifically those who reportedly recognized the true average cost of incarceration—still did not appear to take the full weight of these costs into account unless explicitly prompted. This pattern is consistent with a cost discounting bias that operates when costs are not made explicit.

These findings are consistent with the operation of the availability heuristic—that people base decisions on the information that is most cognitively available, which may be determined by whatever cues in the surrounding context happen to be most salient (Fazio, 1990; Tversky & Kahneman, 1973). Our results show that incarceration costs were considered only when they were salient; when they were not, people may have relied only on the more explicit features of the decision, such as the moral seriousness of the crime or the harm suffered by the victim. Kahneman succinctly described this type of process as a cognitive heuristic which assumes that “what you see is all there is” (Kahneman, 2011). It is not difficult to imagine how such a process could become problematic in moral contexts. Some scholars have gone so far as to characterize this tendency to narrowly attend to a single salient aspect of a moral problem among many relevant aspects as a type of “moral myopia” (Royzman & Landy, 2018).

Criminal law defines several purposes of punishment. Empirically, the dominant driver of laypeople's punishment attitudes is retribution, and this punitive motive operates on an intuitive level, much like a categorical or "sacred" moral value (Aharoni & Fridlund, 2012). However, the fact that the punishment judgments in the present experiments were cost responsive suggests that moralistic punishment attitudes motivating these participants may not be entirely categorical and impenetrable. Rather, the responsivity to cost information, at least when it is made explicit, suggests the tendency to trade off between competing values when formulating an attitude. This finding is consistent with previous research on taboo trade-offs, which has shown that sacred values are hard, but not impossible, to sacrifice when the consequences demand it (Baron & Leshner, 2000; Tetlock, 2003).

Although the majority of participants in the current experiments were willing to temper their punishments at high price points, most were not willing to reduce them to zero. Experiment 1 revealed that punishment was more elastic at relatively lower price points, between zero and $60,000. (It is notable that this range contains the $31,000 US average for state correctional facilities.) However, the punishment curve appeared to plateau at higher price points, suggesting that the first year of prison may be valued to at least $300,000 for the crime of home invasion. One possible explanation here is that people are relatively inelastic on the position that the offender should be punished, but relatively elastic as to how much they should be punished. This interpretation is consistent with the operation of potentially competing cognitive strategies: one relatively automatic process that facilitates moralistic punishment, and a separate, more effortful process that weighs expected costs and benefits of each alternative (see also Kahneman, 2011).

A non-trivial minority of the participants in Experiment 1 could be described as fully cost-insensitive punishers. One obvious hypothesis is that these individuals are motivated primarily by retribution. However, additional research would be needed to determine whether this persistence in punishment reflects a genuine retributive preference, a status quo bias (Kahneman, Knetsch, & Thaler, 1991; Samuelson & Zeckhauser, 1988), or perhaps difficulty in reasoning about large numbers (see Slovic, 2010).

From this curve analysis, however, we do not wish to suggest that the absolute values are representative of the broader US population. Rather, this exercise was intended only to demonstrate a proof of concept that examination of the price elasticity of incarceration is an insightful approach that should be extended to a variety of crimes and stakeholder populations before drawing broad conclusions. Here, such techniques illustrate that, under at least some conditions, some people's punitive attitudes may be so resolute that they may be willing to bear surprisingly large costs to maintain them. On the flip side, other people showed remarkably high levels of elasticity. We were unable to find any factors in our study that correlated with this difference, but clearly future work is needed to determine, first, whether this difference holds in other samples, and second, what features are correlated with more resolute versus more labile punishment attitudes.

That public opinion may be responsive to how sentencing cost/benefit information is presented raises questions for sentencing policy and practice. If laypeople are subject to the same biases as our participants, then the degree of transparency about sentencing costs is likely to be relevant to public taxpayers who frequently cast votes about sentencing policies, serve on juries, and elect justice officials.

One might wonder whether these results offer any insights into the sentencing judgments of real trial court judges. Importantly, this study was not designed to generalize to judicial populations and, therefore, is agnostic to the potential role of legal expertise in cost discounting. However, to the degree that our results capture a general property of human reasoning, they provide justification to separately test judges in future extensions of this work. Presently in the USA, judges are not typically required or advised to consider sentencing costs in their punishment decisions, but this norm is beginning to be challenged, with some jurisdictions now requiring prosecutors to disclose sentencing cost information to judges (Ewing, 2018). Presumably judges are well-versed in such cost information, but the question implied by the new policy and raised by this study is whether recruiting transient *attention* to this information might influence punishment attitudes.

Research suggests that experts, including judges, are not immune to heuristic reasoning. Experts have demonstrated susceptibility to many of the same heuristic processes that shape lay reasoning, such as anchoring, base rate

neglect, and opportunity cost neglect (Bennett, 2014; Northcraft & Neale, 1987; Vera-Muñoz, 1998; West et al., 2012; Wong, Aharoni, Aliev, & DuBois, 2015). Thus, it would not be especially surprising if punishment recommendations by professional judges are also affected by cues that increase the saliency of the costs of incarceration. If attention to cost information affects judicial punishments, this would confer great power to the external, situational cues that draw our attention. Such cues might include explicit prompts, for example, about the costs of incarcerating versus releasing a defendant, or the other allowable uses of the available funds. How best to communicate risk and benefit information to fact finders (e.g., probationary presentencing reports? appellate review?) is the subject of a growing body of scholarship (Chanenson, 2005). Efforts to understand judicial decision making must necessarily consider the role of communication strategies within existing legal policy and practice.

Taken together, the present findings suggest that criminal punishment judgments appear statistically, and morally, elevated—at least until their substantial costs are made explicit. This pattern comports with the view, presented by Baron and Leshner, characterizing sacred values as "strong opinions, weakly held" (Baron & Leshner, 2000). If punitive values are so easily shaped by inconspicuous monetary cues, then increased transparency in cost–benefit trade-offs may help to make these trade-offs more cognitively accessible and in turn generate decisions that more closely align with decision makers' genuine preferences.

4.1 | Limitations and future directions

As with all studies, the results of this study should be interpreted in the context of its limitations. Our goal was to characterize a general property of ordinary decision making, supporting the possibility that our results could generalize to voters and taxpayers. Although we had a diverse pool in terms of demographic variables such as ethnic background and academic major, participants were university undergraduates and disproportionately female, limiting broader generalizability. Future studies should select broader, random samples of US adults to explicitly test the generalizability of these effects to voter, taxpayer, and jury-eligible populations.

Second, the externalized condition yielded slightly different effects depending on whether punishment was assessed using a qualitative versus quantitative scale. Specifically, punishments when costs were externalized significantly exceeded those under the direct cost conditions for the qualitative measure, confirming our predictions. Yet punishments in the externalized condition were not discernibly greater than those of the direct cost conditions when measured on the quantitative sentencing scale. One reason for this discrepancy could be that the sentencing scale prompted participants to think more deeply and perhaps empathetically about the substantial cost to the putative third party. Another possibility is that something about the sentencing scale prompted people to question the face validity of the externalized cost scenario. Although the externalized cost condition was putatively less costly to taxpayers, we do not claim that this condition achieved absolute "zero cost" status since some people might have altruistic motivations to limit spending among third parties. Future research could address such possibilities by constructing and validating other plausible cover stories for low-cost incarceration.

Third, individual differences in executive functioning were not observed. One reason for this could be that such differences do not exist, but given other work on individual differences in executive function we suspect that this is not the case (Kleider, Knuycky, & Cavrak, 2012; Kleider-Offutt, Clevinger, & Bond, 2016). A plausible alternative is that online assessment of individual differences in executive functioning is less sensitive than testing in the laboratory because in online studies the experimenter cannot control the environment and participants can be easily distracted. Moreover, lower working memory capacity individuals are more likely to be influenced by distracting information, which can influence their ability to engage in tests of executive function and to perform the target task (Hasher, Lustig, & Zacks, 2007; Hinson, Jameson, & Whitney, 2003; Kane, Conway, Hambrick, & Engle, 2007; Kane & Engle, 2003). Such factors may have limited our response variability. Broader, more random samples or additional testing using different modalities would help to determine whether such individual differences exist but were missed.

Fourth, the crime scenarios constructed for this study were both moderate in seriousness because we expected that cost discounting would be most dramatic in this range. We would expect that punishments of more serious crimes would be less cost responsive because they will more strongly reflect categorical, moralistic motives. Future studies should actively test this possibility as a part of a search for the boundary conditions of punishment cost discounting.

Fifth, our focus on the costs of incarceration did not permit investigation of other, opposing decision factors, such as the societal costs of releasing a potentially dangerous offender (e.g., increased risk of victimization). We theorized that the costs of release are already salient by default, and our study design assumed that variation in participants' attitudes about these costs would be randomly distributed across conditions. However, testing these assumptions experimentally—for instance, by including a separate condition in which the costs of release are made salient—could help to determine the relative strength of each of these cues on an equal playing field and could help identify where people's default punishment attitudes lie.

Finally, in real life, lay people are not typically asked to make sentencing recommendations (other than capital juries), but they elect judges who do, and they may cast votes for new sentencing programs and policies, underscoring the great importance of lay sentencing attitudes. In our study, we chose to limit the degree of realism in our stimuli and measures to capture these attitudes with high sensitivity and control. Still, like all survey experiments, our study cannot completely rule out demand characteristics such as strategic attempts to affirm or deny the study hypothesis. Future studies should address such issues by considering more realistic stimuli and more implicit and consequential methods of assessing punishment behavior, such as economic games. We imagine that the elasticity of punishment could be even more pronounced in such contexts.

ACKNOWLEDGEMENTS

We thank Alesha Bond, Corey Allen, Sharlene Fernandes, Liang Peng, Chen Ling, and Kristina Leyva for assistance with data collection, analysis, and reporting. We thank Dan D'Amico, Eddy Nahmias, Neil Van Leeuwen, Walter Sinnott-Armstrong, Jennifer McCoy, Douglas Yarn, and Ryan Carlin, Chris Surprenant, Justin Thurman, Judge Morris Hoffman, and the members of the Georgia State University Cooperation, Conflict, and Cognition lab for helpful feedback.

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How to cite this article: Aharoni E, Kleider-Offutt HM, Brosnan SF, Watzek J. Justice at any cost? The impact of cost–benefit salience on criminal punishment judgments. *Behav Sci Law*. 2018. https://doi.org/10.1002/bsl.2388

APPENDIX

STUDY STIMULI

Experiment 1

Instructions

Imagine you are the judge in a criminal trial. The jury has already found the defendant guilty of Home Invasion. Your job is to decide how much the defendant should be punished, if at all. First, you will read a summary of the case. Next, you will consider a level of punishment. Your punishment recommendation should be based on your personal opinion, *not* what you think the court would expect you to say. Then, you will be asked questions about your decision, but you may not go back to previous pages, so please take your time and read the entire case summary carefully. Last, you will complete a numerical memory task and will be asked a few questions about yourself such as age, race, and gender.

Case summary

Mr Edwards is a 33 year old male who has been found guilty of Home Invasion. On July 6th, 2015 at approximately 2:30 a.m., the following event was recorded on the security camera of Mrs Verona, the home owner. Mr Edwards approached Mrs Verona's sliding glass door, smashed the glass using a flashlight, and entered the house. Mrs Verona testified that she woke up to the noise, called the police, and remained upstairs in her bedroom behind a locked door.

From her bedroom window, Mrs Verona saw Mr Edwards getting in a grey sedan with a laptop and other electronics. Mrs. Verona noted the make and model of Mr Edwards' car, and the police arrested Mr Edwards and recovered the property later that night. Mr Edwards has no prior arrests.

[DV1] *How much* should Mr Edwards be punished for this offense? Drag the slider anywhere on the scale.

[DV2] Given the following state sentencing options, how much *time in prison* should Mr. Edwards receive for this offense? Answer options are shown in the total number of years. You can place the slider anywhere below, including between labels.

Before you announce Mr Edwards' sentence, you read the newly released government report of prison expenses in your county. It states

> *The cost of incarcerating a single inmate is about $30,000 per year in taxpayer dollars. All combined, taxpayers in your state pay over a billion dollars each year in prison costs. That translates to roughly $200 dollars per year paid by each taxpayer. The state's corrections budget can also be spent on job training for those at risk. Every dollar saved on prison is a dollar that instead can be spent on building better job opportunities.*

Before learning this new information about the cost of prison, you recommended that Mr Edwards receive a prison sentence of **[X] years**. You now have the option of changing that response with the slider, or you can keep it the same by clicking the checkbox on the right.

[DV2]

Now imagine that the annual cost of prison is going to increase next year, according to the government report. Your job is to decide the punishment for an offender who committed a home invasion just like Mr Edwards.

Each question below asks you to consider what the sentence should be for different prison cost amounts. For instance, when the cost of prison was **$30,000** per year, you recommended that Mr Edwards receive **[X] years** in prison for home invasion.

Please select your punishment for each cost amount below. Remember that the expenses must be paid by the taxpayers in your state. As before, answer options are shown in total number of years and you can place the slider anywhere, including between labels.

If the cost of prison is **$[60,000/90,000/120,000/150,000/180,000/210,000/240,000/270,000/300,000]** per year, how much time in prison should Mr Edwards receive for this offense?

Initially, when the cost of prison was **$30,000** per year, you recommended that Mr. Edwards receive **[X] years** in prison for home invasion.

Imagine prison costs will be paid by private sources. **The state and its taxpayers will pay $0.** Under this assumption, how much time in prison should Mr Edwards receive for this offense? You can keep the prison sentence the same by clicking the checkbox on the right.

Experiment 2

Case summary

Mr Frank Jones has been convicted of one count of aggravated robbery. At the trial, the following evidence was presented.

On the evening in question, 32-year-old Mr Jones entered Speedy's Convenience Store. Mr Jones is seen on video surveillance walking into the store. Mr Jones took an item from the refrigerator and brought it to the counter. Mr Jones handed a bill to the cashier, who was the only other person in the store. The cashier opened the register and then walked into an adjacent workroom to get change.

Mr Jones then walked around the counter and put all the bills from the cash register into an empty backpack. The cashier then returned to the area behind the counter, standing in between Mr Jones and the exit. Mr Jones pushed the cashier out of his way, knocking her to the floor. Mr Jones then fled through the exit door. The cashier was taken to the nearest hospital, where she was diagnosed with a concussion and required 4 stitches. Based on the store's electronic transaction history, the amount stolen was $644.

[Conditions 2–4] Before you announce Mr Jones' sentence, you read the newly released government report of prison expenses in your county. It states:

[Externalized Cost] "The system used to pay for incarceration in this state has just been overhauled. Under the new program, the costs of incarceration are now paid by a government surplus acquired from outside sources, not from taxpayers. Taxpayers no longer pay any costs of incarceration."

[$31,000 Direct Cost] "The cost of incarcerating a single inmate in this state exceeds $31,000 per year in taxpayer dollars. All combined, taxpayers in your state pay over a billion dollars each year in prison costs. That translates to roughly $200 dollars per year paid by each taxpayer. The state's corrections budget can also be spent on job training for those at risk. Every dollar saved on prison is a dollar that instead can be spent on building better job opportunities."

[$101,000 Direct Cost] "The cost of incarcerating a single inmate in this state exceeds $101,000 per year in taxpayer dollars. All combined, taxpayers in your state pay over a billion dollars each year in prison costs. That translates to roughly $200 dollars per year paid by each taxpayer. The state's corrections budget can also be spent on job training for those at risk. Every dollar saved on prison is a dollar that instead can be spent on building better job opportunities."