Punishment Menus and their Deterrent Effects: An Exploratory Analysis

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Abstract: Conventional wisdom suggests that allowing offenders to choose alternative punishments to a previously existing punishment cannot enhance deterrence, because offenders can simply select the least costly option available. After reviewing the deterrence research literature, we argue that punishment menus may encourage individuals to focus more on how they construe the wrongdoing and view the ethical gravity of their actions. We experimentally test whether people may perceive punishment menus as more deterrent than stand-alone sanctions available within the same menu. Our results suggest that this is possible, and that changes in people's perceptions are often mediated by the mindset (e.g., calculative, ethical) they adopt to evaluate punishment schemes as well as their impressions of the seriousness of the illegal act.

1. Introduction

In 2015 an Ohio judge offered a woman the choice between spending 30 days in jail or walking 30 miles after she didn't pay for a thirty-mile cab ride.[1] In the State of Amazonas Environmental Court in Manaus (Brazil) a judge — Adalberto Carim Antonio — is well known for offering environmental offenders a choice between usual punishment (such as a fine or imprisonment) or participation in an alternative arrangement designed "specifically to address the violation" (Pring & Pring, 2009, p. 85). An insightful example is related to the case of "a convicted game poacher of Amazonian manatees." The offender was offered by the

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[1] https://abcnews.go.com/US/ohio-judge-unusual-punishments-people-jail/story?id=33440871

Brazilian judge the choice between a prison sentence and volunteering at a manatee rehabilitation center for a year. The defendant preferred the volunteering option and changed radically. He became one of the country's leading wildlife advocates, 'The Man for Manatees' (Pring & Pring, 2009). There is anecdotal evidence (Hannan, 2017) of improved outcomes associated with offering offenders this type of choice.[2] This is puzzling given the predictions in the literature following Becker (1968) that offering offenders additional punishment options will diminish deterrence compared to a stand-alone sanction. Against this background, Grolleau et al. (2022) recently argued that punishment menus can enhance deterrence in some circumstances due to behavioral factors frequently overlooked in the neoclassical framework. If true, uncovering how these behavioral responses can be harnessed can be useful for designing welfare-enhancing and novel punishment menus. Nevertheless, this a priori counterintuitive proposition has never been tested. To begin filling this gap in the literature, we test experimentally whether people may perceive a punishment menu as more deterrent than a stand-alone sanction.

Our analysis is the first empirical and exploratory attempt to study punishment menus. We run a simple survey experiment with a between-subjects design where subjects are informed about the punishment applicable for an illegal act. Participants indicate their perception of how deterrent the punishment is. The only variation across treatments is the type

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[2] Given that it is very common for judges to have discretion over punishments, a referee questioned whether we can extrapolate from our analysis to think about how judge discretion affects deterrence. The raised issue is very interesting and deserves more attention. Although we, too, were initially tempted to extrapolate and discuss judges' discretion through a similar approach, we noted a crucial difference between our setting and many instances of judges exercising discretion. In most situations, the subject/defendant has no choice in the manner in which the judge exercises discretion. Therefore, we refrain from extrapolating generally to instances where any judgement discretion is involved. However, if the judges' discretion includes giving the offender a choice, then those circumstances can also be discussed with the help of our insights.

of punishment applicable (either a stand-alone punishment, or a menu of two or three punishments). We use four scenarios describing illegal acts (graffiti, littering, fare evasion, and illegally parking in spaces for persons with disabilities) and investigate three mediators of the relationship between menus and deterrence, namely the use of a calculative or ethical mindset and the seriousness ascribed to the behavior.

We find, contrary to the conventional view, that offering additional punishment options can increase the perceived deterrence effect of punishment, but this result is not systematic. Perceptions of deterrence are, in fact, affected differently across contexts. Moreover, deterrence effects are often mediated by changes in the mindset people adopt in evaluating whether to comply with prohibitions. Specifically, the introduction of a punishment menu can affect the extent to which people adopt calculative as well as ethical mindsets and their perceived seriousness of the illegalized act. We provide a more detailed explanation of these context-dependent effects after we describe our experiments.

The next section briefly presents the deterrence theory literature, some behaviorally-informed extensions, and introduces punishment menus as a major innovation capable of altering the manner in which choices are presented, eliciting higher levels of awareness, and generating different attitudes and habits. Section 3 reviews the scarce literature on punishment menus, adds a new argument and explains our hypotheses. Section 4 describes our experimental survey. Section 5 provides the results and discusses them. Section 6 concludes.

2. Taking stock of deterrence research: a mixed evidence synthesis

Most criminal justice policies and practices have their foundations in deterrence theory that was notably formulated by Cesare Beccaria in his *Essay on Crimes and Punishments* published in 1764 and Jeremy Bentham in his *Introduction to the Principles of Morals and Legislation* written in 1780 (White, 2018). Beccaria argued, for instance, that individuals

make rational decisions, by seeking pleasure and avoiding pain. If they are not deterred, individuals will pursue their desires, even by engaging in criminal behavior. Early deterrence research focused on three core concepts namely, the severity, certainty, and celerity (immediacy) of punishment. Increasing punishment in any one of these three dimensions is likely to increase deterrence. Deterrence research also distinguishes general deterrence (the population is deterred from offending when they are aware of punishment applied to criminals) and specific deterrence (individuals who experience punishment after committing a crime are deterred from future criminal activity) (Chalfin & McCrary, 2017; Tomlinson, 2016).

In economics, deterrence theory was revived and formalized by the seminal paper of Becker (1968), but the celerity dimension was not explicitly considered in his model.[3] An important stream of the scholarly literature pertaining to deterrence theory has examined the effect of punishment severity and certainty, and to a lesser extent, punishment celerity on offenders. Given the several up-to-date reviews of analyses of these questions (e.g., Polinsky and Shavell, 2007; Nagin, 2013a; Tomlinson, 2016; Pogarsky et al., 2018; Chalfin & McCrary, 2017; Raskolnikov, 2020; Apel, 2022), some employing a behavioral economics perspective, we describe relevant key elements to directly situate our contributions.

While punishment severity was intuitively a promising candidate to deliver an important deterrent effect (the higher the severity, the higher the deterrence), the results are mixed and evidence often falls short of conclusive proof. Although some earlier studies provide support for the standard hypothesis that severity of punishment is likely to reduce crime (e.g., Levitt, 1998; Kessler & Levitt, 1999), there are other studies which suggest otherwise (see also Henderson & Palmer [2002] for a macro-level analysis). Doob and

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[3] See White (2018) for a discussion about how economists mobilized Beccaria's insights and the issues they neglected.

Webster (2003, p. 143) even concluded that "sentence severity has no effect on the level of crime in society. It is time to accept the null hypothesis" (see also Raaijmakers et al., 2017). The surprising findings in part of this literature can be explained from a behavioral economics framework. Indeed, prospect theory suggests that there is diminishing sensitivity to losses, which implies that after a certain threshold, which may vary by crime type and across individuals based on their specific reference points, additional increases in punishment severity may have little deterrent value, although severity increases before that threshold may have consequential deterrent effects (Pogarski et al., 2018).

The evidence on the deterrent effects of punishment certainty also remains mixed, but is better supported than the impact of punishment severity on crime, and it suggests that punishment certainty is a more effective deterrent than punishment severity (e.g., Killias et al., 2009). While there are many refinements (e.g., non-linearity of certainty impact), Abramovaite et al. (2022) recently stated that "certainty of punishment has been the most explored area and there is now a relatively strong consensus that increasing the likelihood of apprehension reduces crime based on most empirical studies."

In their survey on the effects of swift punishments on crime, Pratt and Turanovic (2018) recognized, on the one hand, that effects of immediate punishments are observed in lab experiments with students or animals where immediacy makes sense. On the other hand, they indicated that "the criminal justice system is not built for speed" and reached the following conclusion: "the bottom line from the criminological literature is that there is no clear evidence of celerity effects in criminal justice processing". A recent work (Dusek & Traxler, 2023) found that variations in the swiftness at which speeding tickets from automated speed cameras are sent does not systematically influence speeding responses. According to Pratt and Turanovic, "with few and isolated exceptions, this body of empirical work reveals a rather

clear consensus that speeding up the time of arrest, prosecution, or incarceration appears to have no consistent effect on one's future criminal behavior."

Given empirical findings that deviate from the implications of simple deterrence theory, scholars recently explored various additional avenues by integrating behavioral economics and ethics insights (e.g., Pickett, 2018; White, 2018; Loughran, 2019; Slepicka, 2022). Following this line of reasoning, we consider whether punishment menus may have effects beyond their effects on the three dimensions described above, and focus less on the opportunity for wrongdoing and more on how the wrongdoing is construed by people perhaps through how they view the ethical gravity of their actions (Feldman et al., 2019). Feldman and Kaplan (2019) even argued that "to improve compliance, it is not enough to set effective sanctions, but it is equally important to consider the way these sanctions affect ethical deliberation and awareness by wrongdoers in real time (…) Punishments and sanctions might be, in some circumstances effective means to improve ethical deliberations (…), but this depends less on the sanction itself and more (…) *on the ways that the possibility of sanction is brought to the attention of potential perpetrators to effectively improve their moral deliberation.*" (emphasis added). Following this line of reasoning, we question whether introducing punishment menus can contribute to raising individuals' levels of awareness by making them more ethically reflective and deliberative when they make decisions and/or improve their implicit attitudes and habits (Feldman & Kaplan, 2021).

3. Punishment menus: An unexploited potential?

Grolleau et al. (2022) develop several behaviorally informed rationales for why punishment menus may serve as effective deterrents, e.g., by causing people to refrain from entering a calculative mindset, pushing them to reconsider the seriousness of the considered act or reducing suspicions about the act being enforced for rent-seeking purposes. Moreover, a

punishment menu can push offenders to better appreciate the wrongfulness of their acts and modify their attitudes towards their transgressions. Similarly, when a stand-alone monetary penalty causes individuals to deduce that authorities pursue self-interested motives such as making money (Shaer, 2019; Graham & Makowsky, 2021), these individuals focus more on the economic consequences of the considered transgression and discount its other dimensions, such as its ethicality and non-monetary consequences (Grolleau et al., 2022).

An additional attractive feature of punishment menus may lie in the relative sense of freedom they offer to offenders. By giving offenders more agency over their punishment, they can prevent reactance-related effects that derives from a sense of limited freedom. Indeed, if regulations and laws are perceived as limiting a freedom that is taken for granted, the individual will tend to lash out and behave irrationally to restore a sense of freedom. In short, punishment menus can serve as powerful "nudges" by allowing to regain a sense of freedom. Interestingly, scholars showed that nudges are perceived as freedom-enhancing devices and benefit from wide public support (John et al., 2022; Sunstein et al., 2018).

These rationales suggest that punishment menus *can* sometimes outperform the traditional single punishment, contrary to the conventional wisdom. Thus, our first hypothesis is that *a punishment menu can be perceived as a greater deterrent than a stand-alone punishment* (H1).

A punishment menu can increase deterrence through several mechanisms. Grolleau et al. (2022) argues that a well-designed punishment menu can affect the extent to which people use calculative and ethical mindsets. A calculative mindset corresponds to a thinking mode wherein an individual's focus is on material costs and benefits, which, in turn, reduces the influence of moral considerations and emotional reactions (Tenbrunsel & Messick, 1999; Wang et al., 2014). Wang et al. (2014, p. 39) define a calculative mindset as "an unintended cognitive predisposition to analyze (non-quantitative) problems mathematically." An ethical

mindset refers to individuals not framing the situation exclusively in economic terms (by weighing personal costs and benefits) but by focusing on the ethical dimensions of the situation. These two approaches or orientations that individuals may adopt in their decision-making processes frequently overlap because individuals may exhibit a combination of both mindsets in various situations, and the distinction between them is not always stark. However, these frameworks highlight the different considerations and priorities that can shape decision-making approaches in different contexts (see Appendix A for characterizing calculative mindset and ethical mindset). Consequently, we hypothesize that *punishment menus influence people's use of calculative and ethical mindset, which in turn influence perceived deterrence compared to a stand-alone punishment* (H2).

A punishment menu also allows the inclusion of a sanction that people typically associate with the worst types of offenses (e.g., imprisonment), and can thus cause people to infer that the offense is more serious or harmful than they initially anticipated (Grolleau et al., 2022). In other words, we hypothesize that *the addition of a severe punishment into the menu can cause the perceived seriousness to increase and lead to higher deterrence* (H3).

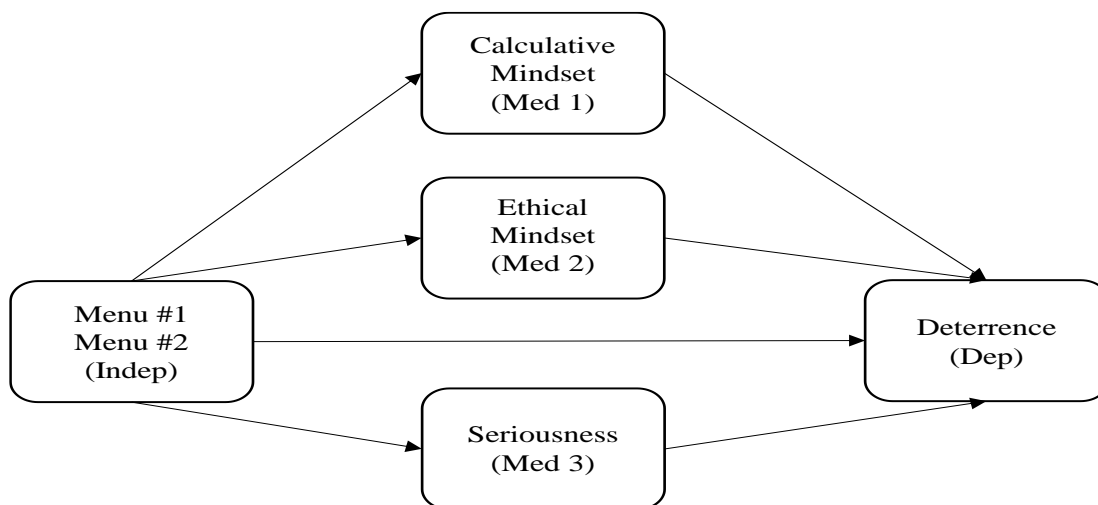The tested conceptual framework relating punishment menus and deterrence is depicted in Figure 1.

Figure 1. Conceptual framework relating punishment menus and deterrence

4. Experimental Survey

4.1. Participants

A sample of individuals in France received an e-mail inviting them to participate in the experiment by clicking on the provided link. 157 individuals (51% female, Average age = 32 years) participated voluntarily and were not monetarily compensated for their participation. Considering an effect size of 0.25, the post-hoc statistical power of our sample using the G*Power program is equal to 0.8. Following a common approach in the literature (e.g., Solnick & Hemenway 2005), we used a convenience sample. We were assisted by one of the authors' students to transfer an email to their networks, including notably fellow students, family, friends, and acquaintances. While convenience samples can be viewed with suspicion, several scholars argued that they can provide relevant data and that most criticisms are misplaced (see, e.g., Krupnikov et al., 2021; Coppock, 2017; Mullinix et al. 2015). For instance, Krupnikov et al. (2021, p. 165) concluded that "much of the empirical research suggests that they [i.e., convenience samples such as under-graduate, crowdsourced and other types such as social media and nonstudent convenience samples] provide valid results for experimental treatment effects that reliably replicate across more representative probability samples". Moreover, experts in criminology recognize the value of convenience samples, especially when a topic is nascent. For instance, in the context of criminology research, Boeri and Lamonica (2015, p. 128; see also Irvine et al., 2018) argue that "convenience samples often supply initial understanding of a complex research inquiry, help develop survey and in-depth-interview instruments, and guide the research in areas that are unknown to the researcher". Although we cannot completely rule-out a potential self-selection bias, there is a priori no reason to consider that this would affect responses differently across treatments.

4.2. Procedure

Participants were informed that they will be presented with four hypothetical scenarios describing in each an illegal behavior (precisely, graffiti; littering; fare evasion; and illegally parking in spaces for persons with disabilities) and the punishment associated with it. An interesting feature of the considered scenarios is their high frequency among the general French population. For instance, according to an IPSOS poll, "41% of French people admit to throwing waste on the sidewalks or in the streets".[4] Similarly, Eric Chareyron, the representative of a major public transport operator in France (Keolis) asserts that "according to our surveys, (…) *55% commit fraud from time to time* (emphasis added)".[5] We used a between-subjects design with three treatments (T0: one punishment A (monetary), T1: choice between two punishments A or B (community service), T2: choice between three punishments A or B or C (imprisonment); see Appendix B for a more detailed description of the punishments in each scenario). For instance, the scenario about tags and graffiti was displayed as follows:

- T0: In order to reduce tags and graffiti of all kinds, a law prohibits this offense. In the case of an offense, each offender will have to pay a fine of € 1,800.

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[4] https://www.ipsos.com/fr-fr/sur-lautoroute-27-des-francais-admettent-jeter-des-dechets-par-la-fenetre-de-leur-voiture

[5] https://www.lemonde.fr/blog/transports/2015/03/06/dans-les-transports-60-des-voyageurs-fraudent-de-temps-en-temps/

- T1: In order to reduce tags and graffiti of all kinds, a law prohibits this offense. In the case of a violation, each offender will have to choose between paying a fine of € 1,800 or performing 180 hours of community service.

- T2: In order to reduce tags and graffiti of all kinds, a law prohibits this offense. In the case of an offense, each offender will have to choose between paying a fine of € 1,800, or performing 180 hours of community service, or a sentence of 18 days in prison.

The scenarios were displayed in a fixed order. For each scenario, participants were asked to indicate whether the proposed punishment was deterrent and whether they think it is likely to reduce the described behavior on 7-point Likert scales. Our survey instrument asked the individuals to rate the deterrence of the proposed punishment (a stand-alone punishment, a menu of 2 or 3 options). Our sentence formulations are identical across treatments, which allows to compare the various treatments. Although there are some variations in the interpretation of the questions, these variations are likely to affect all treatments similarly and make the comparison between treatments relevant and reliable. Of course, future contributions may examine the responses of individuals by inviting individuals explicitly to picture themselves in the described scenarios.

Reported deterrence may not correspond perfectly to actual future deterrence, but we contend that it provides a relevant basis (see Nagin, 2013b for a similar argument). This is due to reasons similar to why we rely on experimental results in developing an understanding of behavioral responses in general (see, e.g., Rubinstein, 2001; Levitt & List, 2007; Falk & Heckman, 2009). Reported deterrence may provide qualitative indications, especially in exploratory research. Although subjects are not in the heat of the moment, there are reasons for why reported deterrence might mimic actual future deterrence. For instance, the clarity of consequences can make the costs of criminal behavior more salient. If the legal system is

perceived as reliable and credible, individuals understand that the consequences are likely to be enforced (see Tyler, 2003).

Additionally, participants reported whether they would adopt calculative and ethical reasonings in each scenario, and their perceived seriousness of the offenses (The survey is included in Appendix B). We do not define what ethical reasoning means in the questionnaire to avoid interference with participants' notion of morality. Our objective was for people to think of these expressions (calculative and ethical reasoning) intuitively, as opposed to through a defined meaning.[6] In treatments involving a punishment menu, subjects were informed that offenders would be able to choose their own punishment. The stand-alone punishment, which is a fine or monetary penalty, can be considered as a default option. This design choice mimics real world situations where the considered offenses (e.g., littering or fare evasion) are usually punished by fining the offenders. Moreover, in the other treatments where a menu is proposed, the monetary penalty comes first on the menu. Although this choice order is not neutral, it is, the most realistic starting point for the illegal behaviors examined here. The participants were randomly assigned to one of the treatments where all four scenarios were enforced through T0, T1 or T2.

5. Results

We first present mean responses by treatment for each scenario (Figure 2). Deterrence was measured using two items ("*Please rate the deterrent power of this sanction*", "*Do you think*

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[6] This question allows us to know as directly as possible whether the two kinds of mindset intervened in the choice and what kind of reasoning was predominant when the respondent evaluated the proposed situations. We did not define the concepts of calculative and ethical mindsets to participants. Our approach was a direct one and refining it constitutes a relevant extension. Although some papers are not directly related to our contexts, they offer a basis to go further in this direction (Kim et al., 2022; Wang et al., 2014).

this sanction is likely to reduce the behavior described above?", Cronbach's alpha between 0.80 and 0.88 across scenarios).
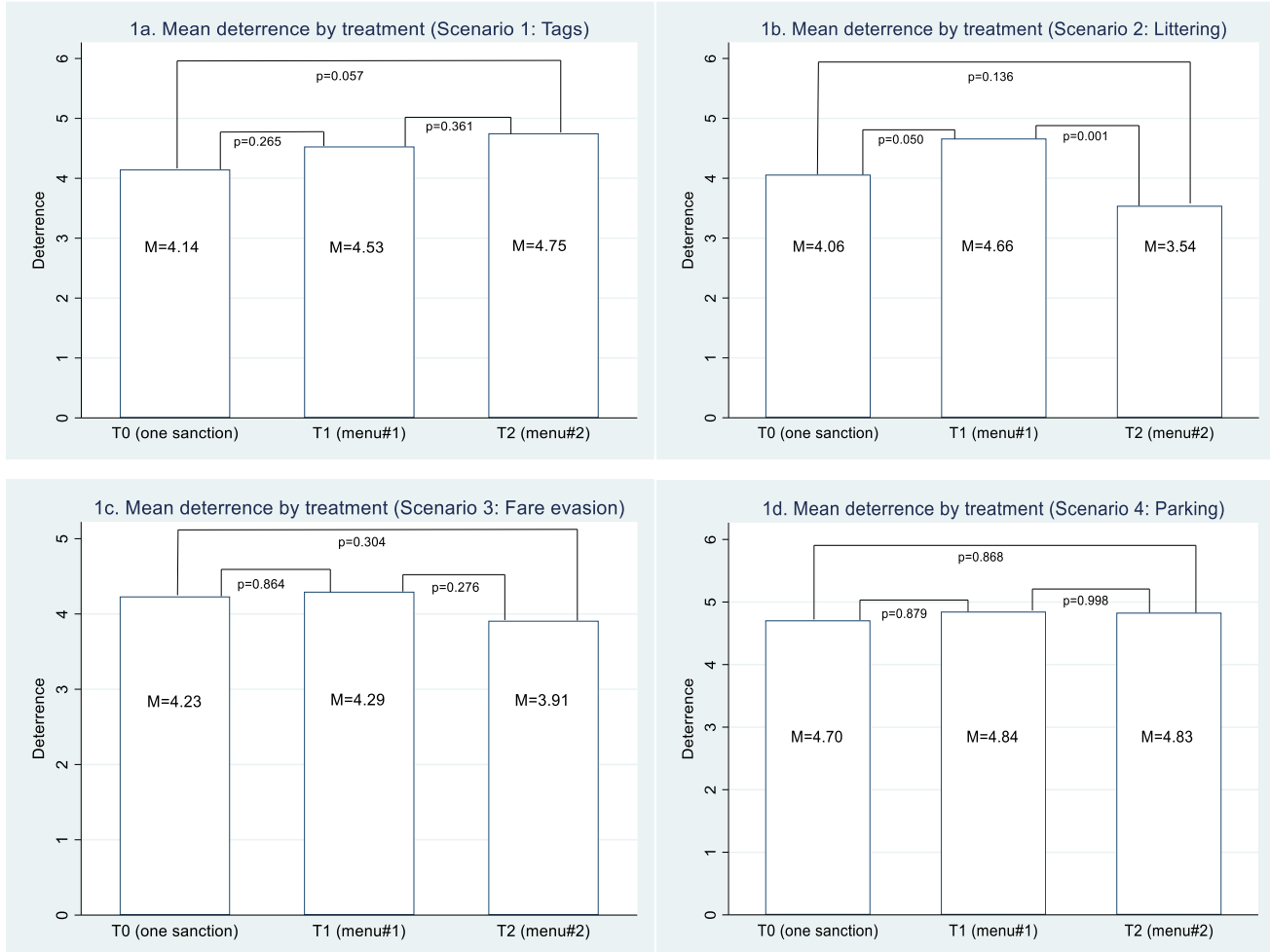
Figure 2. Perceived deterrence

The results from Figure 2 are threefold: (1) Offering the second menu increases deterrence in scenario 1; (2) The first menu increases deterrence in scenario 2; and (3) In scenarios 3 and 4, we found no significant difference.[7] In sum, H1 is only partially supported

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[7] Noteworthy, similar patterns of our results (not reported) are observed when considering sub-samples of the participants by gender or age.

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through mean-comparisons, which suggests that the effectiveness of punishment menus is context specific.

An important issue is why proposing a menu does not seem to affect deterrence in the two scenarios related to fare evasion and illegally parking in spaces for persons with disabilities. Given that we can only speculate on the underlying reasons, we caution the readers to not over-interpret our potential explanations. In the case of fare evasion, the violation is explicitly related to money, by not paying a valid ticket. Consequently, participants can consider that a monetary penalty corresponds well to the nature of the violation. Illegally parking in spaces for persons with disabilities can elicit emotional and moral reactions, making the offer of a menu less likely to make a difference.

Another factor that can contribute to these mixed findings is the potential violence involving human beings (controllers, disabled individuals) that seems more salient in fare evasion and illegal parking compared to environmental offences. As emphasized in Grolleau et al. (2022), all transgressions (and transgressors) are not created equal when one considers the introduction of a punishment menu. Therefore, further investigations are needed to better understand context specificities that can elucidate the deterrence-related effectiveness of punishment menus.

Among additional factors that can explain why littering is the only infraction that elicits a significant difference, we suspect the following may be playing a role: whether the offence has a private versus public nature; affects well-identified victims or the public in general; the participants have or have not witnessed offenders committing these infractions which can elicit more vivid reactions; whether the degree of unethicality ascribed to each offense is large or small; harms a "victim" that can (or cannot) speak for himself (e.g., the environment, animals); involves "hot" or "cold" reactions; and so forth. Littering is also typically related to harming the environment and the public space with victims that are

not/less identified while the other offenses directly imply humans and elicit more emotional reactions. In the case of tags, private property can be harmed and fare evasion and illegal parking often involve real-time interactions with hot reactions. Moreover, some offenses can be categorized as one-time offenses while other ones correspond to repeated behaviors, or even to habits. Nevertheless, we invite the reader to remain cautious given that more work is needed to explore these various dimensions.

Subsequently, we analyzed the data using panel regressions, i.e., after pooling all observations (N=628). We studied both the direct effect of punishment menus on deterrence and the indirect effects of the mediators. To do so, we ran a seemingly unrelated regression (SUREG) (Cameron & Trivedi, 2010), controlling for participants' characteristics (age, gender, education, and income). Some summary statistics of the variables used in estimations are presented in Table 1.

Table 1. Summary statistics

Variables	Whole sample (N=628)		T0: Single sanction (N=232)		T1: Menu #1 (N=196)		T2: Menu #2 (N=200)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Deterrence	4.370	1.611	4.287	1.640	4.584	1.555	4.257	1.620
Menu #1	.312	.463	-	-	-	-	-	-
Menu #2	.318	.466	-	-	-	-	-	-
Calculative mindset	4.554	1.422	4.358	1.500	4.663	1.359	4.675	1.371
Ethical mindset	4.671	1.292	4.866	1.306	4.862	1.205	4.26	1.268
Seriousness	4.830	.845	4.952	.814	4.735	.916	4.78	.795
Age (continuous)	31.993	15.078	27.482	11.254	31.408	14.120	37.8	17.778
Gender (=1 if female)	.516	.500	0.603	.490	.388	.488	.54	.499
Education	3.501	2.206	4.569	1.726	3.020	2.167	2.76	2.273
Income	2.299	1.154	2.224	1.220	2.347	1.207	2.34	1.014

The variable Education refers to the number of years in university. The variable Income ranges from 1 to 5 according to the categories reported in Appendix B.

The results of the SUREG estimation are reported in Table 2. Importantly, the Breusch-Pagan test (last line of Table 2) is significant at the 1% level, which indicates that the disturbance terms of each equation are independent (Breusch & Pagan, 1980) and implies that the SUREG estimation is appropriate.

Table 2. Menus, Mindset, Seriousness and Deterrence (SUREG estimation)

Variables	Calculative mindset	Ethical Mindset	Seriousness	Deterrence
Menu #1	.414***	.049	-.254***	.295*
	(.141)	(.129)	(.085)	(.158)
Menu #2	.460***	-.577***	-.266***	.018
	(.144)	(.131)	(.087)	(.163)
Calculative mindset				.269***
				(.044)
Ethical mindset				.141***
				(.051)
Seriousness				.220***
				(.078)
Age (continuous)	-.014***	.000	.009***	.008
	(.004)	(.004)	(.002)	(.005)
Gender (=1 if female)	.328***	.161	.011	-.103
	(.113)	(.103)	(.068)	(.125)
Education	-.017	.014	-.005	.056*
	(.028)	(.026)	(.017)	(.031)
Income	-.075	.015	-.022	.022
	(.055)	(.050)	(.033)	(.060)
Constant	4.491***	4.662***	4.784***	.877*
		(.200)	(.132)	(.459)
Observations	628	628	628	628
R2	.0554	.0522	.0320	.1163
Chi2	36.82***	34.60***	20.76***	82.66***
Breusch-Pagan test		115.782***		

Note: standard errors in parentheses. *, **, and *** refer to parameter significance at the 10%, 5%, and 1% levels, respectively.

Our findings suggest that hypothesis H1 is supported, since punishment menus are found to influence deterrence, either directly or indirectly. On one hand, Menu #1 (A or B) has a direct effect on deterrence (β = 0.295; p = 0.063) and this effect is positively mediated by the calculative mindset (β = 0.110; p = 0.009) and negatively mediated by the perception of the seriousness of the act (β = -0.057; p = 0.042)[8]. The total indirect effect is equal to 0.054 and accounts for 16% of the total effect. In other terms, relative to a single punishment, Menu #1 leads to a higher likelihood of using a calculative mindset, lower perception of seriousness and increase in deterrence. On the other hand, Menu #2 (A, B, or C) produced no statistically significant direct effect, but significant indirect effects of our three mediators (a positive

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[8] To measure these indirect effects, we used the nonlinear combinations of parameter estimates (Oehlert, 1992) using the *nlcom* command under Stata. We also bootstrapped the estimation with 10000 replications and found that these indirect effects are still significant.

mediating effect of calculative mindset [$\beta = 0.122$; $p = 0.005$] and negative mediating effects of the ethical mindset [$\beta = -0.081$; $p = 0.021$] and the seriousness of the act [$\beta = -0.058$; $p = 0.039$]; total indirect effect = -0.017). In other terms, relative to a single punishment, Menu #2 leads to a higher likelihood of using a calculative mindset, lower likelihood of using an ethical mindset, and lower perception of seriousness, which all influence deterrence.

Importantly, for both menus, the results regarding the ethical mindset and seriousness are surprising and could be interpreted in relation to hypotheses H2 and H3. First, the findings in Table 2 indicate that a punishment menu influences the use of calculative mindset, but it does not facilitate the use of ethical mindset (H2 is partially supported). This result suggests that menus push people to engage in comparisons and calculations, notably to determine which punishment is preferable. To some extent, it allows to refine the insights developed in Grolleau et al (2022) who contend that punishment menus are likely to reduce the activation of a calculative mindset, compared to single punishments. Second, unlike our prediction, our results show that the addition of a severe punishment into the menu caused the perceived seriousness to decrease (H3 is not supported). Although we introduced a priori more severe punishment options (e.g., imprisonment), we did not ask respondents to rate the different options in terms of severity. The availability of a punishment menu may suggest to people that the infraction is not too serious, given that they are afforded a choice in their own punishment. However, if the added options in the menu are perceived as much more severe, they may signal that the infraction is more serious. In sum, our findings suggest that the picture is more complex than expected and the need to refine the hypotheses and their operationalization in future studies.

Overall, our results suggest that introducing a menu will not systematically deliver increased deterrence, and therefore punishment alternatives need to be chosen carefully to affect how people depart from their initial judgments. For instance, an alternative sanction that activates a person's calculative mindset (or reduces the perceived seriousness of the act)

can enhance or reduce deterrence, depending on whether the person's natural inclination—that is, his/her prior predisposition— is to break the law or comply with it and whether subsequent calculations may conflict with this natural inclination. Indeed, some individuals have "an unintended cognitive predisposition to analyze (non-quantitative) problems mathematically" (Wang et al., 2014) while others are naturally predisposed to focus on the ethical dimensions of the problem at stake. This highlights the need to carefully consider subjects natural inclinations prior to designing punishment menus.

6. Conclusion

Punishment menus offer a counterintuitive way to impact and sometimes increase perceived deterrence. We offered the first empirical test of whether punishment can increase deterrence. Our preliminary results paint a complex picture wherein menus can enhance deterrence, but not all punishment menus have the same impact.

There remain several unresolved questions about how effective punishment menus can be designed. It is unclear, for instance, how the effectiveness of punishment menus is impacted by the moral acceptability of the illegal behavior. In our analysis, we considered four different acts, which presumably vary in their social acceptability, and found differing effects. Similarly, it is unclear how the reference point (e.g., fines versus jail time) influences the impact of punishment menus. Many additional questions can be added, e.g., how would the inclusion of unconventional and quasi-customized punishment options (e.g., as in Hannan, 2017) alter the effect of punishment menus?

While our findings provide some preliminary insights into how menus impact deterrence perceptions for low-level offenses, they do not (necessarily) apply directly to more serious offenses. We caution the reader against broad generalizations across different types of offenses. Therefore, an important issue that deserves more attention is related to the potential

relevance of our findings to more serious offences/more severe punishments (e.g., shoplifting, illegal downloading, exam fraud). Indeed, the nature and level of punishment options can indicate to would-be offenders the seriousness of the considered offences. The menu of punishment can also allow the offender to discover, *ex post,* the seriousness of his/her offences (see the case of the poacher quoted in the introduction). Interestingly, Grolleau et al. (2022) suggested that menus of punishment a priori appear more appropriate for less serious offences, but there is a need for additional studies to explore how the effectiveness of punishment menus may interact with the seriousness of the offense.

Another promising direction is to consider more concrete measures of deterrence with other, more diverse and representative, samples, and possibly in other countries. While our analysis of deterrence, which is conducted through data gathered in a French context, may need to be replicated in other settings, we contend that our exploratory study delivers interesting insights about how punishment menus may generate deterrence in real-life circumstances. Indeed, there are differences in the penal system across countries, which can impact the effect of punishment menus on deterrence. Incentive-compatible lab experiments or natural field experiments conducted across different samples with differing cultural compositions would be further steps to gain a better understanding of how punishment menus affect deterrence.

We also note that we did not ask about past carceral history and we cannot check whether participants put more or less weight on jail time or their degree of comfort with community service and follow-up studies that consider these issues may be fruitful. In future extensions, it makes sense to consider a broader range of characteristics such as race,[9] previous

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[9] It is, however, important to mention that asking people about their race is a very sensitive issue in France, due to several historical, cultural, and political factors. The sensitivity around discussing race in France is a complex

experience with similar violations, having a loved one with a criminal background, or the affordability of the fine option in the proposed menu. Nevertheless, several factors lead us to believe our scenarios are reliable. First, the infractions considered are not very major (e.g., tags, littering, fare evasion, parking), which makes us believe that some of our respondents may have engaged in this type of behavior. Second, we are interested not only in the decision-making processes of individuals who are inframarginal offenders, but also in the decision-making processes of inframarginal compliers as well as marginal offenders/compliers. That we are detecting some deterrence effects suggests to us that our sample includes people from all of these groups. Furthermore, we are not sure that under a much larger amount of pressure, an individual facing real financial, temporal, or carceral obligations would reflect similarly to someone who has neither committed this crime nor is obligated to fulfill the selection s/he made.

Interestingly, we can further explore the role of a calculative versus ethical mindset. Self-reported decision-making, guided by relevant questions, constitutes an intriguing extension that can reveal whether individuals adopt a calculative rather than an ethical perspective to reach a decision under various treatments. Concretely, the researcher can consider questions that prompt respondents to reflect on their decision-making process. Some tentative questions could be: "What factors did you consider when making this decision?" "How did you prioritize the different aspects of the situation?" "Did you consider the ethical implications of your choice? If so, how?" "Did you perform any cost-benefit analysis? If so, what did you consider?" Adding some open-ended responses allowing for participants to explain their reasoning in their own words may be an interesting way to gather rich qualitative data to supplement (more) quantitative measures. Another approach could be to prime individuals

issue shaped by historical trauma –notably related to racial classification during World War II, a commitment to universal equality, and a color-blind ideology that resists racial categorization (Bleich, 2001).

with a specific perspective to subsequently examine how the primed perspective influences their perceptions of punishment (see Vohs et al., 2006; Hunt et al., 2022).

Regarding the effect of punishment menus, we acknowledge that we are starting almost from scratch, with much still to be studied. Therefore, the potential interpretations and implications of our exploratory study in a specific context should be considered with caution as an initial effort to better map an uncharted territory. In this exploratory paper, we only highlighted that punishment menus can, contrary to what mainstream theories may suggest, enhance deterrence. How this result can be reliably obtained remains an open question, and answering it requires analyzing additional issues of which we were only able to list a small subset here.

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Appendix A: Characterizing calculative and ethical mindsets (Sources: Tenbrunsel & Messick, 1999; Wang et al., 2014; Rees et al., 2021; The authors)

Comparison criteria	Calculative/Economic mindset	Ethical mindset
Goal orientation	Aims at achieving personal or organizational goals, often driven by considerations of efficiency, profit, or self-interest	Prioritizes moral principles, values, and considerations of right and wrong, even if it means sacrificing certain personal or organizational gains
Decision criteria	Emphasizes quantitative measures and outcomes; decisions are often based on calculations	Considers the moral implications of decisions; decision criteria often include fairness, honesty, and respect of ethical standards
Perspective on others	Interactions with others are often viewed through the lens of instrumental value—how they can contribute to achieving one's goals	Recognizes the intrinsic value of individuals and emphasizes the importance of treating others with respect and dignity with a concern for their well-being
Time horizon	Tends to have a short(er)-term orientation, focusing on immediate gains and outcomes	Often takes a longer-term perspective, considering the enduring impact of decisions on individuals and communities and may involve sacrificing short-term gains for the sake of long-term ethical principles
Motivation	Motivated by achieving specific measurable outcomes, such as financial success, efficiency, or personal advancement	Motivated by a commitment to doing what is morally right and just
Flexibility	Values flexibility and adaptability in decision-making when circumstances change or when they are new opportunities	Prioritizes adherence to ethical principles and values, even in the face of challenges or changing circumstances. Consistency in ethical behavior is considered paramount

Appendix B: Survey translation

Anonymous survey

Part I

In the following, we present you four scenarios. We invite you to read each scenario carefully and answer the questions. There are no right or wrong answers. Please read the scenarios carefully: we are only interested in your sincere opinion.

Scenario *[Tags]*: In order to reduce tags and graffiti of all kinds, a law prohibits this offense. [**T0:** In the case of an offense, each offender will have to pay a fine of € 1,800]. [**T1:** In the case of a violation, each offender will have to choose between paying a fine of € 1,800 or performing 180 hours of community service]. [**T2:** In the case of an offense, each offender will have to choose between paying a fine of € 1,800, or performing 180 hours of community service, or a sentence of 18 days in prison].

Please rate the deterrent power of this punishment on a scale from 1 (not at all deterrent) to 7 (very deterrent):

1 Not at all deterrent	2	3	4	5	6	7 Very deterrent

Do you think this punishment is likely to reduce the behavior described above on a scale from 1 (not at all likely to reduce it) to 7 (very likely to reduce it)?

1 Not at all likely to reduce it	2	3	4	5	6	7 Very likely to reduce it

Please rate the seriousness of the behavior described above on a scale from 1 (not at all serious) to 7 (very serious):

1 Not at all serious	2	3	4	5	6	7 Very serious

Confronted to this punishment, would you adopt an economic reasoning (calculation in terms of cost-benefits)?

1 No economic reasoning	2	3	4	5	6	7 Purely economic reasoning

Confronted to this punishment, would you adopt an ethical reasoning?

1 No ethical reasoning	2	3	4	5	6	7 Purely ethical reasoning

Scenario *[Littering]*: It is an unacceptable act to throw rubbish on public roads. In order to fight against this act, a law provides sanctioning offenders [**T0**: by imposing a fine of € 750]. [**T1**: By imposing either a fine of € 750 or 75 hours of community service]. [**T2**: By imposing either a fine of € 750, 75 hours of community service or 7.5 days in prison].

Same questions about deterrence, seriousness and the mindset.

Scenario *[Fare evasion]*: In order to reduce urban transport fraud, each individual traveling by bus / metro / tram without a transport ticket is punished [**T0**: by a fine of 150 €]. [**T1**: either by a fine of 150 € or 15 hours of community service.] [**T2**: , either by a fine of 150 €, or 15 hours of community service or a sentence of 1.5 day in prison].

Same questions about deterrence, seriousness and the mindset.

Scenario *[Parking]*: Parking in a place reserved for disabled people, even for a short time, is punishable by law. [**T0**: Each offender will have to pay a fine of 300 €]. [**T1**: Each offender will have to pay a fine of € 300 or perform 30 hours of community service]. [**T2**: Each offender will have to pay a fine of € 300, perform 30 hours of community service or a prison sentence of 3 days].

Same questions about deterrence, seriousness and the mindset.

Part II

Please indicate the following information by completing or checking the corresponding box:

1. Age: _____years	4. Your net monthly income:
2. Education: Bac or less ☐ Bac + __years ☐	a) ≤ 800€ ☐ b) Between 801€ and 1300€ ☐
3. Gender: M. ☐ F. ☐	c) Between 1301€ and 2300€ ☐ d) Between 2301€ and 3155€ ☐ e) > 3155 € ☐

Observations: _____