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Gilles Grolleau, Lisette Ibanez, Naoufel Mzoughi. Is a 'bad individual' more condemnable than several 'bad individuals'? Examining the scope-severity paradox. *Review of Law and Economics*, 2020, 16 (3), 10.1515/rle-2019-0017. hal-02448914

**HAL Id: hal-02448914**

**<https://hal.umontpellier.fr/hal-02448914>**

Submitted on 17 Jul 2023

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Gilles Grolleau, Lisette Ibanez and Naoufel Mzoughi\*

# Is a ‘Bad Individual’ more Condemnable than Several ‘Bad Individuals’? Examining the Scope-severity Paradox

<https://doi.org/10.1515/rle-2019-0017>

**Abstract:** Previous literature found empirical evidence to the scope-severity paradox (SSP), corresponding to situations where the perceived harm of a wrongdoing or crime decreases with the number of victims. We examine this phenomenon for the perpetrators’ side. Using a survey experiment, we examine whether increasing the number of perpetrators of a crime, namely a fraud, decreases its perceived severity (and subsequent punishment) at the individual level. Two scenarios are examined corresponding to two kinds of fraud: a fraud committed by a financial adviser against his/her own employer (scenario 1) and a tax evasion by an executive (scenario 2). Overall, our results do not offer a clear-cut support for the scope-severity paradox for the perpetrators’ side, even if some secondary results can be indicative of a possible SSP in some circumstances. More precisely, in the case of a financial fraud, the stated severity increases when the number of perpetrators is low. We discuss the implications of our results and raise important issues for future research.

**Keywords:** crime, identifiability bias, punishment, scope-severity paradox, wrongdoing

**JEL Classification:** C91, D91

## 1 Introduction

It is generally admitted that harming a great number of individuals is worse than harming a few number of individuals. The traditional view stipulates, indeed,

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\*Corresponding author: Naoufel Mzoughi, Ecodeveloppement, INRAE, Avignon 84000, France, E-mail: [naoufel.mzoughi@inrae.fr](mailto:naoufel.mzoughi@inrae.fr)

<https://orcid.org/0000-0002-8153-4615>

Gilles Grolleau, CEREN EA 7477, Burgundy School of Business, Université Bourgogne Franche-Comté, Dijon, France; CEE-M, Université de Montpellier, CNRS, INRAE, Supagro, Montpellier, France, E-mail: [grolleau@supagro.inra.fr](mailto:grolleau@supagro.inra.fr)

Lisette Ibanez, CEE-M, Université de Montpellier, CNRS, INRAE, Supagro, Montpellier, France, E-mail: [lisette.ibanez@inrae.fr](mailto:lisette.ibanez@inrae.fr)

that punishment should be sensitive to the severity of a crime or wrongdoing<sup>1</sup> (Nordgren and McDonnell, 2011). Some recent research shows, however, that the perceived harm of a crime or wrongdoing can be (counter-intuitively) negatively related to the number of victimized people. For instance, Nordgren and McDonnell (2011; see also Konis et al., 2016) found in three studies (two laboratory experiments and an archival data study) that increasing the number of people victimized by a crime actually decreases the perceived severity of that crime and leads people to recommend less punishment for crimes that victimize more people. Such a phenomenon is referred to as the scope-severity paradox, which can be explained by the identifiability bias (Jenni and Loewenstein, 1997; Small and Loewenstein, 2005; Daniels, 2012; Lewinsohn-Zamir et al., 2017) according to which people may feel more concerned by individual identified victims than equivalent statistical victims. Several non-mutually exclusive mechanisms (Hsu, 2008; Jenni and Loewenstein, 1997) have been advanced for the identifiable victim effect, notably (i) the vividness of an identification<sup>2</sup> that is activated through an emotional story, visual images, and real-time unfolding, (ii) the certainty effect, according to which people overweight sure outcomes (e. g. helping a well-identified victim) relative to uncertain ones (e. g. helping statistical or victims faced with a probabilistic victims), (iii) the reference group effect, or the tendency of individuals to overweight the risks that are faced by smaller groups (e. g. a single identified victim) compared to those faced by bigger groups (e. g. statistical victims), and, (iv) the differential evaluation of harm before it occurs (*ex ante*) in the case of statistical victim versus after (*ex post*) in the case of identified victims, which can lead to feeling a greater impetus to help in the latter case relative to the former (Jenni and Loewenstein, 1997).

However, in many situations where consumers are victims, such as the Volkswagen emissions and Cambridge Analytica Facebook scandals, there can be few or several wrongdoers. Hence, while the previous authors focused on *victims*, we examine in this paper whether the scope-severity paradox holds for *perpetrators*. For example, will consumers be more severe against a unique manufacturer that has delivered counterfeited or defective products,

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1 According to the point of view, that is, linguistic, legal, economic, etc. a crime and a wrongdoing correspond to different acts. Despite its interest, such a distinction is beyond the scope of this manuscript. Both terms are used here interchangeably and correspond to any bad action committed by a given entity and implying victims.

2 The vividness effect can be usefully considered as the result of a reduction in the social distance with the victims. For instance, Bohnet and Frey (1999:335) argue that “when social distance decreases, the ‘other’ is no longer some unknown individual from some anonymous crowd but becomes an ‘identifiable victim.’”

compared to a situation where several other manufacturers have perpetrated exactly the same wrongdoing? Put differently, when giving their perception of a given harm, do consumers take in to account the number of wrongdoers, regardless of the level of wrongdoing? Among other things we investigate whether people evaluate an identical individual harm similarly or differently according to the number of wrongdoers, and whether they intend to punish the behavior with the same sanction. In other words, if the individual harm is fixed and identical, do people judge differently each implied individual according to whether they are few or numerous, in absence of any collusion? This issue is especially important nowadays, when wrongdoings and scandals targeted at a given individual or entity (e. g. companies, associations, unions) can quickly affect a number of similar individuals or entities, because of spillover effects (Roehm and Tybout, 2006; Lee, 2017). In the Volkswagen diesel scandal, great concerns were related to whether other car manufacturers cheated as well. In addition to a better understanding of consumers' reactions, it can also indicate whether wrongdoers are likely to unduly influence social and formal judgment thanks to the justified or not manipulation of the number of wrongdoers.

It is now widely admitted that individuals' decisions generally depend more than traditionally expected on affects than on pure rational considerations (System 2) (Slovic et al., 2002), including the identifiability bias. This bias has been explained by some mechanisms (Jenni and Loewenstein, 1997) that can be applied to the number of perpetrators or wrongdoers such as the vividness and reference group effects. The vividness effect suggests that the colorful description of a small number of perpetrators is more likely to evoke powerful emotional responses (System 1) than a higher number of unidentified perpetrators. Interestingly, Kogut (2011) suggested that the "availability of a concrete identifiable target increases the role of emotions in the decision regarding the severity of the punishment". The reference group effect is related to the tendency of people to feel greater concern toward some specific individuals such as perpetrators as the reference group they are part of grows smaller. For instance, arresting the 10 members of a criminal gang out of a group of 10 can be perceived as a great result while arresting 10 members out of a group of thousands of gang members across the country is likely to be perceived as much less noticeable. For instance, mass marketing fraud (e. g. lottery and prize draw scams, inheritance scams, money-making scams and the selling of bogus products and services) can be described by using a case involving either a small number of perpetrators or a very high number of perpetrators. Another example is related to fake degrees where it is possible to either emphasize a particular user/producer of fake degrees with some vivid details or mention a

fuzzy group of users/producers of fake diplomas. For instance, a New York Times article (Lewin, 2007) stressed that Marilee Jones, the dean of admissions at the Massachusetts Institute of Technology has resigned because of the use of fake degrees while a recent UK media coverage (Clifton et al., 2018) emphasized that thousands of UK citizens have bought bogus degrees, even in sensitive domains such as medical or defense ones.

An alternative explanation for a possible SSP for the perpetrators' side can be found in the dynamics of social norms. For instance, it seems reasonable to consider that in cases with many wrongdoers, the social norms of what is accepted behavior change. Indeed, a higher number of wrongdoers can (inadvertently) indicate a descriptive social norm (Farrow et al., 2017) that can be counterproductive for the pursued objective. Consistent with our reasoning, Hauge (2015) found that moral opinions depend on what other people actually do. Consequently, informing individuals that there are many wrongdoers can signal a social norm that leads them to express lower severity and weaker punishment. Indeed, when numerous people are caught doing something wrong, it could suggest that the behavior is more common than when only few people do it. Interestingly, Kelley's theory of attribution stipulates that behaviors that are more common are more attributed to external factors such as social norms and less to internal factors such as the person's character and motivation (Kelley, 1967). Consequently, external observers can judge more leniently the same wrongdoing when it is done by many people (because it is perceived as resulting from situational forces) compared to a situation where only few people (or even only one) do the same wrongdoing (because it is perceived as resulting from dispositional forces). Furthermore, in their work on interaction between social and legal norms, Bénabou and Tirole (2011) show that the frequency of a given behavior in a society changes the perception people have from this behavior (social stigma, heroic behavior, etc.). Applied to our situation, this logic could lead to think that a misbehavior is «more acceptable» when a higher number of people misbehave in a similar way, leading to a decrease of the « social stigma » effect and ultimately to a more lenient judgment.

As far as we know, no study has examined whether increasing the number of perpetrators of a crime or wrongdoing decreases the perceived severity of that act at the individual level, except the recent study by Grolleau et al. (2020) in the environmental domain who did not find support for the existence of an SSP effect. Another study related to our issue is the contribution of Kogut (2011) who showed that when adopting *the injured perspective*, identifiability decreases pity and increases anger, resulting in a severe punishment. Nevertheless, she did not examine whether and how varying the number of wrongdoers is likely to affect

the severity of the punishment. Using a survey experiment,<sup>3</sup> we therefore explore a new hypothesis, by testing whether *a higher number of perpetrators leads to a less severe condemnation* in the case of financial frauds. The originality of our research is at least twofold. First, we test the scope-severity paradox and some collateral effects (the effect of various combinations of manipulating the number of contributors, the level of individual contribution and the global contribution level) for wrongdoers or perpetrators of financial frauds, by varying their number in a between-subjects design. Second, we investigate some related issues such as a potential gender effect. As stressed above, this study will allow us to reach a better understanding of consumers' reactions to identical wrongdoings or offences but also to anticipate whether wrongdoers are likely to anticipate consumers' reactions and accordingly manipulate the perceived or real number of wrongdoers.

The remainder of our contribution is organized as follows. Section 2 describes the empirical strategy. Section 3 exposes the main findings and discusses them. Section 4 concludes and suggests directions for further research.

## 2 Empirical strategy

In order to test our hypothesis, we conducted a survey experiment among a random sample of the French population via the French platform *Foule Factory*.<sup>4</sup> Similarly to the U.S. Amazon Mechanical Turk, this platform gives the opportunity for an integrated participant compensation system which complies with the national regulations on minimal wage, a large participant pool and a streamlined process of study design, participant recruitment, and data collection (Buhrmester et al., 2011).

Surveyed people were invited to read two scenarios about two distinct financial frauds. The first scenario describes a fraud committed by a financial adviser against his/her own employer causing the latter a loss of a given amount of money. The second scenario relates to a tax evasion of an executive allowing him/her to not pay a given amount of taxes on a ten-years period (the details of the scenarios and instructions are provided in the Appendix). For either scenario, participants were invited to indicate the severity of the committed fraud

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<sup>3</sup> Following Akay et al (2012, see also Graf et al., 2012), our use of the term “survey experiment” is motivated by the fact that our survey uses a between-subjects design in which participants are randomly assigned to various conditions.

<sup>4</sup> <https://www.foulefactory.com/>.

on a Likert scale ranging from 1 (not severe at all) to 10 (extremely severe) and the sanction they would recommend for the perpetrator. While the sanction in the first scenario is monetary (up to 5 times the amount of the fraud), in the second scenario, it is expressed as a number of years that respondents think the perpetrator has to spend in jail, with a maximum threshold of 10 years. To avoid any order effect, half participants read the fraud against an employer scenario first and the other half read the tax evasion scenario first. Interestingly, these scenarios fit several real-life situations where the punisher, e. g. a judge handling a specific case,<sup>5</sup> is not directly affected by the wrongdoer's behavior (Kogut, 2011).

In the experimental economics community, the use of hypothetical scenarios is sometimes regarded with suspicion, notably because of the lack of incentive compatibility and the likelihood of facilitating a social desirability bias. Nevertheless, several authors argued that hypothetical questions, are not only convenient, but also fast and inexpensive (Thaler, 1987, 2015). Historically, they have led to path-breaking advances. We concur with several authors arguing that well-designed surveys can provide reliable evidence, notably from a qualitative viewpoint (Camerer and Hogarth, 1999; Rubinstein, 2001; Read, 2005; Thaler, 2015). Moreover, *Foule Factory* workers are rewarded for their participation, even if it is not incentive compatible. Furthermore, the between-subjects design allows us to neutralize a possible social desirability effect. Last but not least, the use of hypothetical scenarios is common in business ethics research and has enabled remarkable advances (see Weber, 1992 for an extensive discussion).

The scope-severity paradox is tested by varying the number of perpetrators with a between-subjects design, that is, one perpetrator versus a low number of perpetrators (2) *versus* a high number of perpetrators (30). To control for all the possible situations, we implemented five treatments (Table 1) by fixing the amount of the individual fraud ( $F_i$ ) in some treatments and the amount of the global fraud ( $F_g$ ) in the others. When fixing the individual fraud and increasing the number of perpetrators, the total amount of the fraud increases with the number of perpetrators. If the perceived severity ( $S_i$ ) is based on the individual action, regardless of others, then judgment would be identical for all the treatments with a constant individual fraud. If respondents take into consideration the total amount of fraud inflicted to the employer, even when they judge an individual, this would imply an increase in the perceived severity. Nevertheless,

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<sup>5</sup> To make justice to this comparison, we must also indicate that judges have reference points (the level of punishment defined by the law or the jurisprudence). The discretionary power of judges is also limited by official scales defining the level of punishment for each type of crime. The scales used in our survey instrument mimic to some extent these reference points.

Table 1: Treatments used in the experiment.

	Individual Fraud is constant (Fi1 = Fi2 = Fi30)			Global Fraud is constant (Fg1* = Fg2* = Fg30*)		
<b>Treatment and number of perpetrators (N):</b>	T1 (N = 1)	T2 (N = 2)	T30 (N = 30)	T1* (N = 1)	T2* (N = 2)	T30* (N = 30)
<b>Individual Fraud (Fi) = Scenario 1</b>	Fi1 = 300K€ 10M€	Fi2 = 300K€ 10M€	Fi30 = 300K€ 10M€	Fi1* = 9000K€ 300M€	Fi2* = 4500K€ 150M€	Fi30* = 300K€ 10M€
<b>Global Fraud (Fg) = Scenario 1</b>	Fg1 = 300K€ 10M€	Fg2 = 600K€ 20M€	Fg30 = 9000K€ 300M€	Fg1* = 9000K€ 300M€	Fg2* = 9000K€ 300M€	Fg30* = 9000K€ 300M€
<b>Severity (Si) and sanction (Yi)</b>	Si1 Yi1	Si2 Yi2	Si30 Yi30	Si1* Yi1*	Si2* Yi2*	Si30* Yi30*

The treatments T30 and T30\* are exactly the same.



the social norm effect and other identifiability-related mechanisms can lead people to judge the same wrongdoing less harshly when perpetrators are numerous. Consequently, we hypothesize that a scope-severity paradox occurs when the severity ( $S_i$ ) and/or the sanction ( $Y_i$ ) decrease(s) with the number of perpetrators, when the individual fraud remains constant. So, according to Table 1, there is a SSP effect if  $S_{i1} > S_{i2} > S_{i30}$  and/or  $Y_{i1} > Y_{i2} > Y_{i30}$ , i. e. if the severity and/or the individual sanction decrease when the number of wrongdoers increases. Noteworthy, participants were randomly assigned to the treatments.

In order to go deeper and better understand the underlying drivers behind individual responses, we introduced additional questions to take into account the relative importance of various factors: (i) the harm caused by the considered individual (regardless of the violation of an ethical standard), (ii) the violation of an ethical standard (regardless of the harm caused), (iii) the whole harm caused that is intolerable. Participants were given the opportunity to indicate on a 7-point Likert scale the importance of the following reasons when judging the two scenarios: (i) the employer (or financial and stock exchange authorities) has (have) been deceived and wronged (regardless of the respect of regulations), (ii) the individual has violated a law (regardless of the impact on employer/financial and stock exchange authorities in S2), and, (iii) the committed fraud is unacceptable. Moreover, surveyed individuals were also invited to indicate some socio-demographic characteristics, namely, their age, gender, education level and earnings. Last but not least, prior to our survey experiment, we conducted a pilot study among a convenience sample of 208 individuals which allowed us to substantially improve the above-mentioned design. Indeed, in the pilot study, we considered just one scenario (fraud against one's employer) and only two treatments (low versus high number perpetrators) and we did not account for the individual versus global amount of fraud. The scenario of this pilot study lacked precision, but helped us to refine the end-scenarios. In addition, the questions about the drivers behind individual responses were not included.<sup>6</sup> In sum, the pilot study allowed us to address the previously mentioned issues.

The relation between the number of perpetrators of the fraud ( $N$ ) and the reported levels of perceived severity ( $S$ ) and suggested sanction ( $Y$ ) is analyzed using a multivariate regression for a simultaneous equation model (Amemiya, 1974). More formally, we assume  $S_i$  and  $Y_i$  to be our dependent variables – corresponding respectively to perceived severity and suggested sanction – and

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<sup>6</sup> The details of the pilot study and instructions as well as collected data are available from authors upon request.

consider a simultaneous equation model defined by:  $y_i = Ax_i + \varepsilon_i$ , where  $y_i$  is a 2-dimensional vector of random variables  $S_i$  and  $Y_i$ ,  $x_i$  is the vector of  $k$  exogenous variables,  $A$  represents a  $2 \times k$  matrix of estimated parameters, and  $\varepsilon_i$  is the disturbance term, which is assumed to be normally distributed with zero mean.

### 3 Results and discussion

We collected 779 responses. The respondents' mean age is around 40 years old and 58 % of them are male (see also descriptive statistics in Table 4). A Kruskal-Wallis test (not reported but available upon request) shows that our sample is balanced across treatments in terms of age, gender and education. Interestingly, looking at individuals' responses for the whole sample, that is, regardless of the treatment (Table 2), we observe that, on average and for both scenarios, close to 50 % of the participants picked the most severe rating, i. e. 10.

**Table 2:** Average judgements and punishments of fraud (N = 779).

Variable	Mean	SD	Min	Max	Proportion choosing the highest level
<i>Scenario 1</i>					
Severity	8.86	1.46	3	10	49.55 %
Sanction	3.13	1.51	0	5	32.35 %
<i>Scenario 2</i>					
Severity	8.73	1.61	1	10	47.5 %
Sanction	5.82	3.33	0	10	28.37 %

Let us now examine the responses by treatment (Table 3). At first glance, our hypothesis of a scope-severity paradox is not supported, since we did not find a statistically significant difference between mean individual responses in terms of perceived severity or recommended punishment. In other words, the severity of the fraud and the recommended sanction do not decrease with the number of perpetrators. Moreover, the judgments and sanctions are similar for different levels of fraud. It is worthy to notice that a multiple hypothesis testing using the MHTEXP module (List et al., 2019) yields the same results. At first glance, this result can be considered as reassuring to some extent, given that individual transgressors are not over-penalized. It is, however, worthy to notice that the results obtained in the pilot study mentioned in the previous section suggested a

**Table 3:** Mean responses for the severity and sanction per treatment (SD between brackets).

Variable	Scenario 1					Scenario 2				
	T1	T2	T30	T1*	T2*	T1	T2	T30	T1*	T2*
Severity	8.81 (1.60)	8.79 (1.49)	8.78 (1.38)	9 (1.41)	8.9 (1.42)	8.69 (1.73)	8.84 (1.45)	8.75 (1.53)	8.67 (1.68)	8.73 (1.63)
Sanction	3.13 (1.48)	3.08 (1.48)	3.21 (1.51)	3.13 (1.58)	3.11 (1.5)	5.53 (3.33)	5.72 (3.35)	5.98 (3.28)	5.86 (3.38)	6.08 (3.34)
Number of observations	135	170	149	166	159	192	143	134	156	154

partial support to the SSP, but the results were probably biased because of the flaws of the scenario design. Given that our actual design is more rigorous, we consider the present findings as more robust.

However, controlling for age, gender, education, and the drivers of individuals' responses in a multivariate linear regression, our findings suggest that the scope-severity paradox is partially supported, under some specific circumstances. The variables used in estimation are reported in Table 4.

**Table 4:** Variables used in estimation and descriptive statistics (N = 779).

Variable	Mean	SD	Min	Max
<i>Socio-economic</i>				
Age	39.35	12.02	18	78
Gender (= 1 if male)	0.58	0.49	0	1
Education High (Bac+ 2 and more)	0.71	0.46	0	1
<i>Important drivers (response = 6 or 7)</i>				
The victim deceived and wronged (S1)	0.662	0.473	0	1
The victim deceived and wronged (S2)	0.614	0.487	0	1
Violation of the law (S1)	0.721	0.449	0	1
Violation of the law (S2)	0.719	0.45	0	1
Fraud is unacceptable (S1)	0.685	0.465	0	1
Fraud is unacceptable (S2)	0.709	0.455	0	1

S1 and S2 stand for scenario 1 and scenario 2, respectively.

The results of the regression are presented in Table 5. The multivariate regression model (i. e. both linear regressions taken together) is statistically significant for both the Wilks' lambda and Pillai's trace criteria (i. e. all p-values are < 0.0001). Moreover, overall, the model explains 37,12 % (respectively 45.36 %) of the variance in the outcome variable (i. e. perceived severity) in scenario 1 (respectively scenario 2).

For scenario 1, the stated severity increases when the number of perpetrators is low (either 1 or 2), which is consistent with the previous work by Nordgren and McDonnell (2011) focusing on the victims' side. The level of fraud is also positively correlated to severity judgement. However, this result does not hold for scenario 2. These *a priori* divergent findings may be explained by the fact that the identity of the victim in scenario 1 is the employer whereas in scenario 2, the victim is a financial authority. A possible explanation relies on the identifiability bias (Jenni and Loewenstein, 1997; Small and Loewenstein, 2005; Daniels, 2012; Lewinsohn-Zamir et al., 2017) according to which people may feel more concerned and more motivated to act consistently by one well-identified victim than by fuzzy financial authorities that correspond indirectly to

**Table 5:** Effect of treatments on perceived severity and suggested sanctions (multivariate linear regression).

	Scenario 1		Scenario 2	
	Perceived severity (S)	Suggested Sanction (Y)	Perceived severity (S)	Suggested Sanction (Y)
One perpetrator	0.257**	-0.049	-0.016	0.082
Two perpetrators	0.541***	0.074	-0.13	-0.019
Thirty perpetrators (Ref)	-	-	-	-
High global fraud	0.251***	0.064	0.008	0.424*
The victim deceived and wronged	0.644***	0.357***	0.661***	0.936***
Violation of the law	0.905***	0.432***	0.745***	0.622**
Fraud is unacceptable	0.881***	0.343**	1.478***	2.381***
Gender	0.132	0.107	-0.061	0.366*
Age	0.007**	-0.0004	0.004	-0.028***
Education high	-0.01	0.056	0.220**	0.298
Constant	6.336***	2.211***	6.514***	3.502***
Observations	779	779	779	779
F	50.44***	6.776***	70.94***	22.839***
R2	0.3712	0.074	0.4536	0.211
	<i>Multivariate test, F</i>		<i>Multivariate test, F</i>	
Wilks' lambda	23.15***		33.41***	
Pillai's trace	20.22***		28.37***	

\*\*\*, \*\* and \* refer to significance at the levels of 1 %, 5 % and 10 % respectively

numerous equivalent statistical victims (Small et al., 2007). We also find that respondents with a high education level judge more severely a fraud against financial and stock exchange authorities, which is not surprising as educated people are more active within the stock exchange markets (Liivamägi, 2016) and therefore more “familiar” with the victim. Last, but not surprisingly, the three main drivers of participants’ responses (the victim has been deceived and wronged, the law has been violated, the fraud is unacceptable) impact positively judgements and punishments of the fraud.

Concerning the effect of the number of fraud perpetrators on punishment levels, we do not find any support for the SSP, i. e. our findings suggest that the recommended punishment does not depend on the number of perpetrators for both scenarios and both types of sanctions (financial sanction or number of years that respondents think perpetrators have to spend in jail). Moreover, the

level of sanctions is mainly explained by drivers of participants' responses, i. e. people who indicate drivers ("the victim has been deceived and wronged", "the law has been violated", "the fraud is unacceptable") to be important recommend higher punishment levels. It is worthy to notice that, in scenario 2, participants for whom "Fraud is unacceptable" is an important driver of their response, recommend an extra of 2.381 years in jail. We do not observe such an important increase in scenario 1 (i. e. only a 0.343 increase in the financial penalty). Again, a possible explanation might be related to the identifiability bias.

## 4 Conclusion

Our study does not offer a clear-cut support for the SSP for the perpetrators' side. Nevertheless, we found partial support for a SSP in the case of a financial fraud where a higher number of perpetrators leads to a lower perception of its severity. Interestingly, these divergent results can be related to the identity of the victim, i. e. whether the victim is an employer or financial and stock exchange authorities. The former is more likely to be considered as an identifiable victim while the latter is more likely to correspond to unidentifiable and statistical victims. Punishment, on the other hand, does not depend on the number of perpetrators, regardless of the type of victim, but may depend on the type of fraud. Put together, these results can indicate that people behave as if they distinguish the wrongdoing from the victim. Rather than providing a clear-cut conclusion, our results constitute a vibrant call to further research on the scope-severity paradox. If the paradox is confirmed at least for some kinds of crimes or for some kinds of victims, perpetrators in some specific circumstances, can have a vested interest to emphasize that they are not alone and that others behave similarly (and even worse).

From an economics perspective, knowing whether the number of perpetrators of a crime (or a fraud) impacts the perceived harm of the crime at the individual level is interesting if one considers the structure of the market. Are individual judgments similar for a fraud in a very concentrated market (such as a market of car manufacturers) and in a competitive market (such as a plumber market)? Are individual judgments similar for a fraud that could directly affect mass public (such as individuals who have participated to our experiment) and for a fraud that could occur only in an insider market (such as a financial fraud)?

Our study involves hypothetical decisions. These limitations indicate directions for further research, e. g. by considering real decisions thanks to archival data or field experiments, robustness across the same (other kinds of financial crimes) or different domains (other types of crimes such as school related fraud

or terrorism). Another dimension is to consider whether the scope-severity paradox is a non-linear relationship. If the bias is well-supported in future studies, maybe for some subdomains, the consequences can be considerable. If official judges or onlookers are affected by these subtle manipulations, de-biasing individuals deserves more attention (Jolls and Sunstein, 2006). A natural candidate is to inform and caution concerned people about the existence of the bias at an adequate time. Last, but not least, if this effect is due to System 1 emotional reasoning overriding System 2 analytical reasoning, a simple way to go further could be to replicate our experiment by imposing various time limits before entering replies in order to seek whether the SSP vanishes or is reinforced.

**Acknowledgments:** The authors are very grateful to Jean-Marc Rousselle for research assistance. They are also grateful to Nives Della Valle and Alain Marciano for their useful comments and suggestions. They also thank the editor, Pr. Christoph Engel, and two anonymous reviewers for their valuable feedback that helped them to substantially improve the experimental design used in the manuscript. Finally, they acknowledge the financial support by the French National Research Agency (GREENGO Project, ANR15-CE05-0008-01).

## Appendix 1: Scenarios used in the survey instrument [adapted from Nordgren and McDonnell (2011) and translated from French]

*The scenarios described above are hypothetical and independent. Please, read them carefully and answer the questions. There is no good or wrong answer. Only your sincere viewpoint matters.*

### Scenario 1:

*[Treatments T1, T2 and T30]*

Thanks to a sophisticated illegal system, a [2/30] financial advisor[s] [in 2/30 different companies] managed to divert 300K€ [each 300K€] to his [their] personal advantage. This total of 300K€ [600K€/9000K€] represents a dry loss for his/her [their] employer[s]. Investigations have clearly shown that this [these] financial advisor[s] is [are similarly] responsible for this [these] misappropriation[s].

*[Treatments T1\* and T2\*]*

Thanks to a sophisticated illegal system, a [2] financial advisor[s] [in 2 different companies] managed to divert 9000K€ [each 4500K€] to his [their] personal advantage. This total of 9000K€ represents a dry loss for his/her [their] employer[s]. Investigations have clearly shown that this [these] financial advisor[s] is [are similarly] responsible for this [these] misappropriation[s].

Please indicate how you judge the severity of the act committed by this [each of these] financial advisor[s] [knowing that they made their decisions independently and without arrangement] on the scale below:

1 Not all severe	2	3	4	5	6	7	8	9	10 Extremely severe
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Suppose that this type of behavior can result in a fine of up to 5 times the amount of the fraud for each convicted individual. According to you, how much this [each of these] advisor[s] should pay? \_\_\_\_\_ times the amount of the fraud (between 0 and 5).

Regarding your answers to the two previous questions about the act committed by this [each of these] financial advisor[s] and the fine, please indicate the level of importance of the following reasons:

Reasons	Not important				Very important		
	1	2	3	4	5	6	7
The employer has been deceived and wronged (regardless of the respect of regulations)	1	2	3	4	5	6	7
The individual[s] violated a law (regardless of the impact on employer[s])	1	2	3	4	5	6	7
The committed fraud is unacceptable	1	2	3	4	5	6	7

**Scenario 2:**

*[Treatments T1, T2 and T30]*

An [2/30] entrepreneur[s] made [each] false declarations to the financial and stock exchange authorities, which allowed him/her [them] to gain illegally 10M€



[10M€ each] over 10 years. This total of 10M€ [20M€/300M€] should have been paid to the tax department if he/she [they] had honestly declared all his/her [their] income to the authorities.

*[Treatments T1\* and T2\*]*

An [2] entrepreneur[s] made [each] false declarations to the financial and stock exchange authorities, which allowed him/her [them] to gain illegally 300M€ [150M€ each] over 10 years. This total of 300M€ should have been paid to the tax department if he/she [they] had honestly declared all his/her [their] income to the authorities.

Please indicate how you judge the severity of the act committed by this [each of these] entrepreneur[s] [knowing that they made their decisions independently and without arrangement] on the scale below:

1	2	3	4	5	6	7	8	9	10	Extremely severe
Not all severe										

Suppose that guilt for this type of behavior can result in condemnation of up to 10 years in jail for each convicted individual. According to you, how many years in jail this [each of these] entrepreneur[s] should be condemned to? \_\_\_\_\_ years (between 0 and 10).

Regarding your answers to the two previous questions about the act committed by this [each of these] entrepreneur[s] and the condemnation, please indicate the level of importance of the following reasons:

Reasons	Not important					Very important		
	1	2	3	4	5	6	7	
The authorities have been deceived and wronged (regardless of the respect of regulations)	1	2	3	4	5	6	7	
The individual[s] violated a law (regardless of the unpaid amount of money)	1	2	3	4	5	6	7	
The committed fraud is unacceptable	1	2	3	4	5	6	7	

Please, indicate the following information:

1. Age: __ years	2. Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>	3. Education: (French) Bac + __years. Less than Bac <input type="checkbox"/>
4. Status: Professional <input type="checkbox"/> Student <input type="checkbox"/> Other (Please, precise) _____ <input type="checkbox"/>		
5. Your net income/month (€): < 500€ <input type="checkbox"/> Between 500€ and 1000€ <input type="checkbox"/> Between 1001€ and 1500€ <input type="checkbox"/> > 1500€ <input type="checkbox"/>		

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