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# Norm enforcement in the city: A natural field experiment*

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**Abstract**

Extensive evidence from laboratory experiments indicates that many individuals are willing to use costly punishment to enforce social norms, even in one-shot interactions. However, there appears to be little evidence in the literature of such behavior in the field. We study the propensity to punish norm violators in a natural field experiment conducted in the main subway station in Athens, Greece. The large number of passengers ensures that strategic motives for punishing are minimized. We study violations of two distinct efficiency-enhancing social norms. In line with laboratory evidence, we find that individuals punish norm violators. Men are more likely than women to punish violators, while the decision to punish is unaffected by the violator's height and gender. Interestingly, we find that violations of the better known of the two norms are substantially less likely to trigger punishment. We present additional evidence from two surveys providing insights into the determinants of norm enforcement.

**Keywords**: norm enforcement, social norms, field experiment, altruistic punishment, cooperation
**JEL codes**: C93, D63, H41

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## 1. Introduction

Social norms can be defined as customary rules of behavior that govern interactions among people (Young, 2008). These rules influence our decisions in a wide range of circumstances ranging from the definition of property rights to our obligations towards our colleagues, family members and our behavior in public places. The interest of economists in social norms can be explained by the fact that, in many instances, norms serve to enhance efficiency by reducing externalities or transaction costs (e.g., Coleman, 1990; Elster, 1989; Young, 1998). Examples of efficiency-enhancing social norms include the norms of non-littering in public places and queuing.

The existence of social norms depends on the willingness of individuals to adhere to them. One reason why people may choose to adhere to a norm is because of the threat of being punished if they deviate from it (Sugden, 1986; Coleman, 1990).[1] Norm enforcement, however, is often costly for the enforcers as it can lead to reprisals. A typical assumption in economics is that, unless an individual stands to benefit directly from enforcing a norm and the benefit exceeds the cost, they will not do so. While punishing a norm violator can be beneficial if individuals interact repeatedly (e.g., Fudenberg and Maskin, 1986; Fudenberg et al. 1994), in large modern societies, many of the daily interactions are with strangers. This raises the question of what explains the adherence to norms that is often observed in one-shot interactions.

Recently, economists proposed an answer to this question: some individuals may be willing to punish norm violators even in one-shot interactions, because they derive non-pecuniary benefits from punishing (e.g. Fehr and Gächter, 2000; Fehr and Gächter, 2002; Masclet et al. 2003). In other words, some people may enjoy punishing norm violators so much that the benefit from punishment exceeds the cost. In anticipation of this, individuals may adhere to norms. The evidence in support of this explanation comes from laboratory experiments showing that many (indeed, the majority of) participants are willing to pay to reduce the earnings of norm violators, even when they do not anticipate any pecuniary benefits themselves. For example, Fehr and Gächter (2002) report that 84.3 percent of subjects in their laboratory experiment use costly punishment in a public good experiment even though they know they will never interact again with the same individuals. As we will

[1] According to Young (2008), apart from the threat of punishment, there are two other mechanisms sustaining norms. One is negative emotions such as guilt or shame that are triggered when norms have been internalized. The other is the desire to avoid costs that could result from coordination failure.

see below, similarly high percentages are reported in most studies (for surveys see Chaudhuri, 2011; Gächter and Herrmann, 2009).

The prevalence of social norms in daily life implies that the willingness to engage in costly norm enforcement can have significant implications for a wide range of situations which are of interest to economists such as collective action and contract design (Fehr and Fischbacher, 2002). While there is considerable evidence from laboratory experiments regarding the willingness of individuals to engage in costly punishment, there is little evidence of such behavior in the field.[2] Indeed, anthropological studies indicate that costly punishment is rarely used for the enforcement of norms. Guala (2011; p.30) who reviews this literature concludes that "…there is no evidence in the anthropological literature that costly material punishment is used in small acephalous societies, except in the regulation of sexual conflict." He suggests that the rare use of costly punishment in the field vis-à-vis the lab may be because important forces that exist in daily life (e.g., the ability of punished individuals to counter-punish or the ability to communicate with norm violators) are absent from most laboratory experiments.[3] However, a problem with the anthropological studies is that interactions are repeated and, in addition, individuals have multiple ways for enforcing norms.[4] Thus, while the absence of costly enforcement in the anthropological literature raises questions about the willingness of individuals to use costly punishment to enforce social norms in daily life, its rare occurrence cannot provide conclusive evidence about whether individuals are willing to enforce norms at a cost in the field in one-shot interactions.

The main aim of this paper is to investigate whether individuals punish norm violators in anonymous, one-shot interactions in the field. To address this question we conducted a natural field experiment. The experiment is "natural" in the sense that participants were unaware an experiment was being run (Harrison and List, 2004). To our knowledge, this is the first

[2] Note that, while in many instances individuals can enforce norms through the use of reward or punishment, in this paper we focus on the use of costly punishment. As such, we will treat the terms *costly enforcement* and *costly punishment* as synonyms. Similar to Guala (2011), the adjective *costly* is used to indicate that the enforcer has to incur a cost for enforcing a norm and not that the cost of enforcing the norm exceeds the benefit.

[3] Allowing for these forces is known to limit the use of costly punishment (Denant-Boemont et al., 2007; Nikiforakis, 2008; Nikiforakis and Engelmann, 2011; Xiao and Houser, 2005). For example, similar to Fehr and Gächter (2002), Nikiforakis (2008) finds that when punishment cannot be retaliated and individuals are randomly reassigned to groups, 89.6 percent of subjects use costly punishment in a public good experiment. This percentage drops to 68.8 when punishment can trigger counter-punishment. Similarly, Nikiforakis and Engelmann (2011) report that when punishment cannot be retaliated, 81.3 percent of subjects punish, but when punishment can lead to a lengthy feud, 63.5 percent of subjects punish in the first punishment stage.

[4] Recent laboratory studies have provided evidence that individuals can be quite forward looking if there exists a prospect of future interactions (Cabral, Ozbay and Schotter, 2011; Reuben and Suetens, 2011).

evidence from a natural field experiment on costly norm enforcement.[5] In the experiment, we violated two efficiency-enhancing social norms in a controlled way and recorded the behavior of the individuals who observed the violations. The "exogenous" violation of the social norms has the advantage that it allows us to control for the characteristics of the violators (e.g. gender, height, appearance) and is also necessitated by the fact that, once a norm is well established, violations are typically rare.

Studying costly punishment in a natural field experiment has multiple advantages. First, participants are neither aware that their actions are being observed nor do they have beliefs about the aim of the experiment. As is well known from economic and psychology experiments, both factors can significantly affect participants' behavior (e.g., Benson, 2000; Hoffman, McCabe and Smith, 1996). Second, participants in our study do not self select into the experiment. We thus avoid a potential selection bias (e.g. Harrison and List, 2004; Levitt and List, 2007). Third, participants in our experiment are faced with the violation of well-established social norms, which have evolved over a long time horizon. The willingness of individuals to punish norm violators, therefore, may differ to that in laboratory experiments. Fourth, we observe individuals' willingness to punish in a setting where the cost of punishment is not induced by the researcher. This is important as in the field the expected cost of punishment is likely to be higher than in the laboratory where if a violator decides to avenge punishment, at most, the enforcer can lose their entire earnings from the experiment. In contrast, in the field, the consequences can be direr. [6] Of course, one disadvantage of field experiments such as ours is that some control is inevitably lost. For this reason, and in order to gain further insights into the determinants of norm enforcement, we also conducted two surveys. We discuss them in detail in the following section.

To ensure interactions are one-shot, the experiment was run in the main subway station in Athens, Greece. The station is used daily by hundreds of thousands of passengers which

[5] In a recent paper, Noussair, van Soest and Stoop (2011) report the results from a framed field experiment to examine cooperation in a social dilemma where individuals can use costly reward and punishment. Three important differences to our experiment are that (*i*) individuals were aware that they were participating in an experiment, (*ii*) interactions between individuals were not one-shot, but finitely repeated, and (*iii*) incentives were exogenously manipulated.

[6] In extreme cases, punishing a violator can lead to the enforcer being injured, psychologically traumatized or even killed. Recently there have been a number of high-profile cases in Germany and the U.K where individuals were either severely beaten or killed for trying to enforce social norms. In one case in Germany, for example, a pensioner was severely beaten for asking two teenagers to stop smoking in a Munich subway station (Spiegel, 2008). In another case in England, police offers were beaten up after asking a 15-year old girl to stop littering (Edwards, 2011). For other recent examples see Fresco (2008) and Spiegel (2010).

implies that strategic motives for punishing are minimized. The violations were done in a way that we have prior reason to believe makes punishment costly. Indeed, survey evidence that we collected and we discuss later in the paper indicates that punishment is considered costly by individuals. A further important feature of our design is that violations can only be punished by one person at a time. The reason we decided to include this feature in our study is that norm enforcement can be a second-order public good, since everyone benefits from the enforcement of the norm but all would prefer that someone else punishes violators, if punishment is costly. Also, similar to laboratory experiments, costly punishment is the only way to enforce norms in our study. As Casari (2012) points out, the ability to use multiple means to punish norm violators (e.g., withholding rewards) may be one reason explaining the rarity of costly punishment in the field.

The first norm prescribes that passengers stand on the right side of the escalators so that others who wish to walk up the escalators can use the left side. One of the experimenters stood on the left side. In case an individual requested the norm violator to stand on the other side, the violator was instructed to ignore the request. This implies that enforcers would have to insist and possibly raise their voice or push the violator aside, thus making norm enforcement costly for them. The second norm prescribes that individuals do not litter in public places. All subway stations in Athens are noticeably litter-free. Violators of the non-littering norm threw either a wrapped-up colored piece of paper or a plastic water bottle in a corridor leading to the platforms. Both norms are efficiency enhancing as most passengers benefit from a clean subway station and would prefer to have the option to walk on the left side.[7]

The reason we chose to violate two social norms rather than one is that we wanted to test the robustness of our findings regarding the propensity of individuals to punish norm violators. A notable difference between the two norms is the degree of their *universality*. The escalators norm is *environment specific* as, in Greece, it is found only in the subway system. The non-littering norm, on the other hand, is *universal* as it exists not only in subway stations, but also in other places (e.g., at home, at the workplace). Therefore, while all individuals are likely to be aware of the non-littering norm, infrequent users of the subway system may not be aware of the escalators norm. This difference could, in principle, affect observers' willingness

[7] As we discuss in detail in the next section, a number of steps were taken such that private incentives for enforcing the escalators norm (i.e., being a hurry) are minimized. The survey evidence presented in the results section indicates that these steps were successful in minimizing private incentives as the vast majority of people enforcing the escalators norm did so out of a dislike of the violation.

to punish norm violators. For this reason, we included vignettes describing the violation of the two norms in one of our surveys. Respondents were asked to state how they would react to the violation and the reasons for their actions.

Our findings indicate that, in line with laboratory experiments, some people are willing to use costly punishment to enforce norms in one-shot interactions. However, these individuals are a minority. Out of 300 cases of norm violation, punishment was observed in only 35 cases (11.7 percent). Questionnaire data indicate that the main reason for the unwillingness of individuals to punish norm violators is that people are concerned about being counter-punished by the norm violator. The rate of enforcement is affected by neither the height nor the gender of the violator, but men are more likely than women to enforce norms.

One surprising finding is the substantially different rate at which the two norms are enforced. Violators of the universal norm (non-littering) are punished in only 4 percent of cases, while violators of the environment-specific norm in 19.3 percent of cases. This is despite the fact that substantially more individuals report being bothered by the violation of the non-littering norm. One reason for the difference in enforcement rates suggested by our survey evidence is that violators of the non-littering norm are considered to be more likely to counter-punish than violators of the escalators norm.

The paper proceeds as follows. In the next section, we discuss the experiment in detail. In section 3, we present the results from the experiment. In section 4, we discuss in detail different explanations that could account for the different rates of enforcing the non-littering and the escalators norm. The last section concludes by discussing the implications of our findings and topics for future research.

## 2. The experiment

### 2.1. Location and population

The experiment was run in the main subway station of Athens (Syntagma Station). Approximately 650,000 passengers daily use the two main subway lines of the Athenian subway which intersect at the station.[8] As described below, the sessions were run in five different locations inside the station. The team of experimenters consisted of six individuals (the researchers and four research assistants), whose tasks included the systematic violation of two social norms, the collection of data on the behavior of passengers in response to violations, as well as the collection of survey data inside the station. All sessions were run

[8] The information was taken from the ATTIKO METRO website on July 23, 2011. http://www.amel.gr/index.php?id=8&L=1&cHash=37a860319ea26b2e30e3b58f6b6ecfdc

between 2pm and 8pm to avoid morning peak hours, on four different working days between April 27th and May 3rd, 2011.

One may wonder how different the population in Athens is compared to other "populations" frequently studied by experimental economists (e.g., British, Swiss) with regards to its inclination to enforce norms. To address this question, prior to running the experiment, we used the data collected by Herrmann, Thöni and Gächter (2008) to compare the rate of costly punishment in laboratory experiments in Athens vis-à-vis other locations. The results can be found in Table A1 where we present the percentage of subjects that engage in costly punishment (our variable of interest) and the percentage of instances were punishment was directed towards an individual contributing less than his/her peers on average. It can be easily seen that subjects in Athens are not noticeably different than subjects in other places. For example, consider Nottingham and Zurich – two laboratories where experiments on costly punishment have frequently been run. We find that the percentage of subjects using costly punishment in laboratory experiments in Athens (88.6 percent) is similar to that in Nottingham (89.5 percent) and Zürich (82.6 percent). The majority of punishment cases in Athens (62.8 percent) is aimed towards free riders who contribute less than their peers on average. This is similar to the percentage of punishment cases aimed at free riders in Nottingham (61.7 percent) and slightly lower than in Zürich (69.9 percent). On the basis of this evidence, we have no prior reason to believe that the rate of enforcement in Athens should be noticeably different than in other locations that have been frequently studied by experimental economists.

### 2.2. Social norms and violations

#### 2.2.1. Escalators

The "escalators norm" prescribes that passengers stand on the right side of the escalators so that others who wish to walk up the escalators can use the left side. Violations of the escalators norm were implemented as follows. An experimenter (henceforth, the *violator*) was waiting on the platform once a train arrived. Violators were dressed casually wearing a pair of new blue jeans and a black shirt. After a train arrived and the first transit passengers stepped on the escalator, the violator started walking upwards, on the left side, as the norm dictates.[9]

[9] The number of passengers who stepped on the escalator before the experimenter was between 15 and 20. This was done for three reasons. First, it allows transit passengers to observe the norm before the violation occurs. Second, it reduces the likelihood that the person behind the violator is in a hurry, as these individuals are typically the first to come out of the trains – an issue which we discuss in greater detail later in this section.

After taking a couple of steps, the violator stopped walking and stood on the left side of the escalator next to another passenger on the right side. This was done in a way that made it difficult for those behind the violator to continue walking upwards. After waiting for approximately 8 seconds, the violator moved to the right side of the escalators, allowing the passenger(s) behind them to pass. If before the 8 seconds elapsed the individual immediately behind the violator (henceforth, the *observer*) asked the violator to move to the right, the violator was instructed to ignore the request and keep standing on the left. This was done to ensure that enforcement was considered to be costly for observers. If the observer asked for a second time, then the violator moved to the right side of the escalator without saying anything. In those cases where the observer insisted on the violator standing to the right, we say that they enforced the norm. We call these observers *norm enforcers* or simply *enforcers*.[10]

We collected data on three different escalators, all of them connecting the two main lines of the subway. The escalators were all moving upwards, taking passengers from their arrival to their departure platform. As we are interested in studying the propensity to engage in costly norm enforcement, the experiment was designed in a way that minimized the number of observers who would punish because they were in a hurry. In particular, five steps were taken. First, the experiment was run in relatively short escalators where the private benefit from forcing a violator to stand on the right was minimal (about 8 seconds). Second, the experiment was run during off-peak hours so that fewer people were in a hurry. Third, during these hours, trains ran every three minutes, so that missing a train did not impose a large waiting cost on observers. Fourth, we only chose escalators with a staircase next to them, which could be used by passengers who were in a hurry to catch a train. Finally, experimenters waited for a while before they violated the norm, so that passengers in a hurry could rush to the escalators. In the results section we show that these steps had the desired effect as the large majority of instances where an observer asked the violator to stand on the right were indeed due to a desire to enforce the escalators norm, and not due to observers being in a hurry.

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Finally, after the first passengers reach the escalator, a longer queue is quickly formed on the right side which implies that individuals are not indifferent between standing on the left and the right side, all else equal.

[10] While in principle other passengers could also enforce the norm by shouting at the violator from a distance, it seems natural that the responsibility for doing so rests with the person directly behind the violator, whose way is obstructed. This is actually one of the reasons why we chose to violate this norm, as the second-order public-good problem is minimized. In any case, we never observed any cases of enforcement from passengers other than the enforcer.

Experimenters worked in pairs. Besides the violator, a second experimenter stood discretely at the top of the escalator and collected data regarding: the location where the violation occurred; the time of the violation; the identity of the violator; the sex, approximate age, height and the reaction of the observer. The latter included information on whether there was norm enforcement, whether the observer continued walking up the escalator when the violator stepped to the right, and – if there was no enforcement – whether the observer tried to pass without talking to the violator.

In order to have a better understanding of the motivation of enforcers, once they reached the top of the escalators, the second experimenter approached them and asked them a small number of questions (which in many cases meant that they had to board the train along with the enforcer). In particular, the enforcer was asked to indicate the reason for asking the violator to stand aside. This could be (*i*) that they were in a hurry; (*ii*) that it is not right to stand on the left side of an escalator; (*iii*) that they wanted to teach the violator that in the future they should stand on the right; or (*iv*) other reasons. Options (*ii*) and (*iii*) are meant to help us distinguish between those who are simply annoyed by the violation of the norm and those who are more forward looking. Option (*iv*) allowed enforcers to express other reasons of their own for asking the violator to stand aside. Multiple answers were allowed.

### 2.2.2. Littering

The second norm prescribes that individuals do not litter in public places. We violated the non-littering norm inside the subway station by throwing either a wrapped-up colored piece of paper (A4 size) or a small, empty plastic bottle of water (approximately 30 cm long) in a corridor leading to one of the platforms. The violator pretended to be reading a sign explaining the location of the different platforms, until they noticed a *single* person approaching. That person will be called the *observer* in the littering treatment, and we will say that an observer enforced the norm if they asked the violator to pick up the garbage they threw or reprimanded them in some other way. That is, as in the case of the escalators, norm enforcement is not a second-order public good.[11]

[11] As in the case of the escalators, other individuals were present in the area where the violation occurred. This implies that an observer could reasonably expect others to interfere if tension was to be triggered by enforcing the norm. It should be noted that there was roughly the same number of bystanders for each violation for both norms (even though in the case of the non-littering norm they typically could not observe the norm violation itself). In particular, we tried to have approximately 6-7 individuals in close proximity to the violator and the observer to control for audience effects.

Once the observer approached the violator, the latter started walking in front of them at a pace that was slightly slower than the pace of the observer. When the observer was approximately 3-4 meters from the violator, the latter threw the paper/bottle on the ground. The violation was done in a way that left no doubt that the violator intended to litter. However, the fact that the observer was behind the violator meant that the observer could not be sure whether the violator knew that they were being observed.[12] We decided to do this as we thought that the non-littering norm would be less likely to be enforced if it was violated in a provocative manner.

Experimenters again worked in teams of two. The second experimenter stood approximately 10 meters away from the point of the violation pretending to read a newspaper. Apart from recording information regarding the time and the location of the violation, as well as the characteristics of the observer (see section 2.2.1), their role was to ascertain that the observer witnessed the norm violation by monitoring their gaze. In case an observer enforced a norm, the second experimenter went up to them and asked them to respond to a short questionnaire examining the reason(s) for enforcing the norm. Possible answers included (*i*) a desire to indicate to the violator that they should respect the clean environment in the future; (*ii*) that it is wrong to throw litter; or (*iii*) other reasons. Multiple answers were allowed.

### 2.3. Additional treatments

Apart from examining the enforcement of two different norms, we studied the impact on norm enforcement of the height of male violators in both the escalators and the littering treatments. Male violators were either 1.70m or 1.90m. At the time of the experiment, the average height for a Greek male was 1.80m. It seems plausible that punishing a tall violator will be perceived by enforcers as being more costly all else equal, given the risk of direct confrontation in the event of counter-punishment by the violator.

We also varied the gender of the violator. The female violator was 1.70m.[13] Interpreting differences in enforcement rates depending on the gender of the violator is not straightforward. Higher enforcement rates could be due to the fact that enforcers perceive the punishment of female violators as being less costly. However, other gender-related factors such as a reluctance to punish a female violator due to chivalry may reduce enforcement rates.

[12] Videos of the two types of violations and other material related to the experiment such as the questionnaires are available from the authors upon request.

[13] We did not vary the height of the female violator as we were unable to find female research assistants of 1.50m. The average height for a Greek female is 1.60m.

The resulting 2x3 design, summarized in Table 1, consists of two different social norms and three different types of norm violators. We collected 50 observations per cell, summing up to a total of 300 observations.

**Table 1: Experimental Treatments**

| *# of obs.* | Male violator: 190 cm | Male violator: 170 cm | Female violator 170 cm | Total |
|---|---|---|---|---|
| Escalators | 50 | 50 | 50 | 150 |
| Littering | 50 | 50 | 50 | 150 |
| Total | 100 | 100 | 100 | 300 |

### 2.4. Surveys

In order to better understand behavior in the experiment, we also conducted two surveys on general attitudes towards the two social norms in question. The surveys were conducted in the same subway station where the experiment took place. The first survey, as described in section 2.2.1, targeted individuals who enforced a social norm. For the second survey, we asked 150 users of the subway who were waiting on the platforms for the next train. Nearly, all individuals we approached agreed to take part in the survey.

In this second survey, respondents were initially faced with a scenario describing the violation of either the escalators norm or the non-littering norm. The scenario mirrored the way in which norms were violated in the experiment using, however, a neutral language (i.e., no reference was made to 'norms' or 'violations'). Respondents were then asked if they would be bothered by the actions described in the scenario. In case of a positive response, respondents were further asked if they would confront the individual in the scenario. Those who stated that they would not be willing to do so were then asked to indicate their reason(s), which could include the fear that norm enforcement could lead to tension (i.e., counter-punishment), the fact that the norm is not widely accepted, the fact that others do not enforce the norms, and other norm-specific questions.[14] The order with which the different reasons appeared in the survey was randomized.

[14] For example, in the case of littering, one response was that there is cleaning staff employed by the company in charge of the subway. In the case of the escalators, respondents could state that the delay imposed by the violator is trivial.

In addition, the surveys elicited data on the perceived universality of each of the two norms, the frequency of using the subway in Athens and other cities, and some demographic data. In total, we conducted 150 surveys; 75 for each of the norms. 50.7 percent of the respondents were female. The mean estimated age among respondents was 37 years, while the median age in the population is 42.5 years.

## 3. Results

The data from our experiment indicate that a number of individuals are willing to enforce social norms in one-shot interactions in the field. However, norm enforcement is observed only in a minority of cases. In particular, out of the 300 cases when one of the norms was violated, there were only 35 instances of enforcement. That is, norms were enforced in 11.7 percent of instances. Figure 1 shows that the non-littering norm is enforced in only 4 percent of instances, in 6 out of 150 cases. The escalators norm is enforced more frequently, in 29 out of 150 cases (19.3 percent).[15] The difference in enforcement rates across the two norms is statistically significant ($p$-value<0.01, chi-square test).

**Result 1:** *Norm enforcement is observed in 11.7 percent of cases. The non-littering norm is enforced in 4 percent of cases, significantly less frequently than the escalators norm, which is enforced in 19.3 percent of cases.*

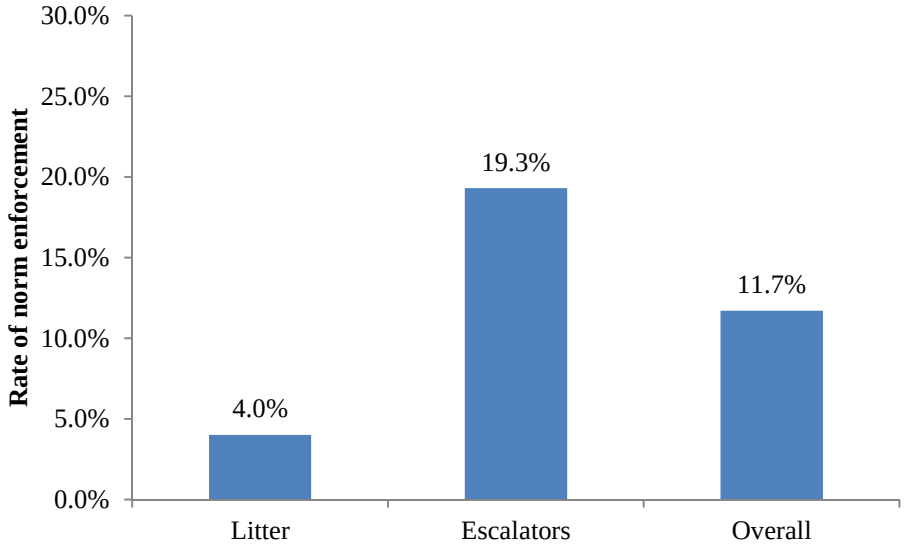
Result 1 raises two questions: (1) What can explain the fact that the majority of observers does not enforce the social norms? (2) What can explain the infrequent enforcement of the non-littering norm relative to the escalators norm? We first address question (1) using the survey data we collected. The answer to question (2) is more involved. Hence, we address it separately in section 4.

The first explanation one needs to consider for the fact that the majority of observers does not punish norm violators is that they are simply not sufficiently bothered by the violations. However, as it turns out, this is not the case. The majority of survey respondents (68 percent) stated that they would be bothered "quite a lot" or "a lot" by violations of the norms (102 out of 150 respondents). In particular, 45.5 percent of the survey respondents said they would be bothered by an individual standing on the left side of the escalators (34 out of 75 respondents), while 90.7 percent of survey respondents stated that they would be bothered by

[15] There were also 8 instances in which the observer asked the violator of the escalators norm to move to the right, but did not insist after the violator ignored their request. We do not classify these instances as costly norm enforcement. However, none of the results reported in the paper are affected if we add these observations in the analysis.

a person who litters in the subway (68 out of 75 respondents). The difference is statistically significant ($p$-value<0.01, chi-squared test). Therefore, a paradox emerges where violations of the universal norm trigger stronger negative reactions – as one would have anticipated – but are *less* likely to trigger punishment.[16] We offer an explanation for this paradox in section 4.

**Figure 1: Rates of norm enforcement in the experiment**




What *is* then the reason why most observers do not punish norm violators? The most common reason given by respondents who are bothered by the violation of the norm for not enforcing it is their fear of retaliation by violators (60.8 percent of respondents across norms). This is the most common answer both for the escalators and the non-littering norm (non-littering: 71.9 percent of respondents; escalators: 45 percent of respondents). It indicates that punishment is considered by individuals to be costly and that, for the majority of our observers, the cost of punishment exceeds its benefit. Figure A1 in the appendix presents the other reasons provided by respondents for not punishing a norm violator.

**Result 2:** *The main reason for the unwillingness of individuals to enforce social norms is the fear of retaliation by violators.*

[16] It is worth noting that the survey responses yield qualitatively the same result as our experiment. In particular, while survey respondents are more likely to state that they would punish norm violations than observers did in the experiment, in line with our experimental results, survey respondents state higher willingness to enforce the escalators norm (29.3 percent) than the non-littering norm (18.7 percent).

We now turn our attention to the impact that the height of the violator has on the observers' willingness to enforce norms. Taller male violators (1.90m) are punished in 10 out of 100 cases, while shorter male violators (1.70m) are punished slightly more frequently (in 12 out of 100 cases). The difference is, however, not statistically significant (*p*-value=0.65, chi-squared test). Therefore, we conclude that the height of the violator does not impact on the rate of norm enforcement. This is somewhat surprising as one could expect that, the taller a violator, the more costly norm enforcement would be, all else equal. Given that the fear of retaliation was found to be an important factor in the decision to enforce a norm, one explanation for this finding is that the cost of punishing even a (relatively) short violator is sufficiently high.

**Result 3:** *The height of the violator does not affect the likelihood of rate enforcement. Taller violators (1.90m) are as likely to be punished as shorter violators (1.70m).*

Does the gender of the violator affect the willingness of observers to enforce norms? On the one hand, since the fear of counter-punishment is a major determinant of whether to punish violators (see Result 2), one may expect that observers will be more likely to enforce a norm when the violator is a woman, assuming that female violators are less effective in counter-punishing or less likely to do so. On the other hand, however, observers may be less willing to punish female violators as, similar to many other developed countries, a social norm of chivalry exists in Greece prescribing that women are treated with more care than men. As it turns out, the gender of the violator does not affect the likelihood that a norm is enforced. In particular, controlling for the height of the violator (1.70m), female violators are punished in 13 out of 100 cases, while male violators in 12 out of 100 cases. The difference is not statistically significant (*p*-value=0.83, chi-squared test).

**Result 4:** *The gender of the violator does not affect the likelihood of norm enforcement. Female violators are as likely to be punished as male violators.*

While the gender of the violator does not affect enforcement rates, the gender of the *observer* does. The majority of enforcers in our experiment are male (23 of 35 across norms). Given that the sample of observers is quite gender-balanced (152 women and 148 men), the gender difference in the enforcement rate is statistically significant (*p*-value = 0.04, chi-square

test). This result is mainly driven by enforcers in the escalators treatment as there are very few instances in which the non-littering norm was enforced.[17]

**Result 5:** *Men are more likely than women to punish norm violators.*

**Table 2: Determinants of norm enforcement**

| *Dependent variable*: Probability of norm enforcement | (1) | (2) |
|---|---|---|
| *non-littering norm* | -0.153 *** (0.036) | -0.150 *** (0.036) |
| *male violator* | -0.030 (0.045) | -0.058 (0.053) |
| *tall violator (190cm)* | -0.016 (0.043) | -0.032 (0.049) |
| *male observer* | | 0.093 ** (0.038) |
| *observer shorter than violator* | | 0.035 (0.042) |
| $R^2$ | 0.088 | 0.115 |
| *prob. > chi*$^2$ | 0.001 | 0.000 |

Results are from a probit regression with robust standard errors; entries are marginal effects. N=300; **, *** denotes significance at the 5%, 1% level respectively.

Before we conclude this section, in Table 2, we present evidence from a regression analysis investigating the determinants of norm enforcement in our experiment. The dependent variable is a binary variable taking the value of 1 if the observer enforced the norm and 0 otherwise. The first regression includes our treatment variables (non-littering norm, violator's height and violator's gender) as independent variables. The second regression extends the empirical model to control for the observable characteristics of the observer, namely whether they were male or female, and whether they were shorter than the violator. Entries are marginal effects.

[17] We note that male respondents in our survey were also more likely to state that they would punish norm violations than female respondents. Across norms, 23 out of 74 male respondents said they would enforce the norm (31.1 percent), compared to 13 out of 76 female respondents (17.1 percent). The difference between these "hypothetical" enforcement rates is statistically significant (*p*-value=0.05, chi-squared test).

The results presented in column (1) confirm Results 3 and 4, that is, the height and the gender of the violator do not affect significantly the likelihood that the observer punishes the violator. In addition, we find that violators of the non-littering norm are approximately 15 percent less likely to be punished. The results presented in column (2) provide additional support for Result 5. In particular, male observers are 9.3 percent more likely to enforce a norm. The regression also shows that the height of the observer relative to the violator does not have an impact on the likelihood of norm enforcement.

## 4. Explaining the difference in enforcement rates across norms

The main purpose of our experiment was to investigate whether individuals use costly punishment to enforce norms in one-shot interactions in the field and study some of the determinants of norm enforcement. To check the robustness of our findings, we chose to violate two efficiency-enhancing social norms, which differed in (at least) one notable dimension – the degree of their universality. As we saw (Result 1), the rates of enforcing the two norms differ substantially. As mentioned, the low rate of enforcing the non-littering norm relatively to the escalators norm seems at first puzzling. The reason is that substantially more survey respondents stated that they would be bothered "quite a lot" or "a lot" by the violation of the non-littering norm (90.7 percent) than by that of the escalators norm (45.5 percent). In this section, we use the evidence from our two surveys to examine different explanations behind this puzzle.

*OBSERVERS IN A HURRY*: One possible explanation for the difference in enforcement rates across norms is that the direct benefit from enforcing the escalators norm exceeds that from enforcing the non-littering norm. This seems plausible as violators of the escalators norm may cause some observers to miss the next train. As discussed in section 2.2.1, five steps were taken to minimize the possibility that observers of violations were in a hurry. Nevertheless, it is possible that some of the "enforcers" in the case of the escalators were simply in a hurry. In order to investigate the extent to which this explanation can account for the higher rate of enforcing the escalators norm, we examine the reasons provided by those enforcing the escalators norm for their actions in the separate survey that we conducted with them (see section 2.2.1).

Of the 29 enforcers, we were able to obtain responses from 23; three enforcers refused to respond to the survey without stating a reason, one enforcer did not understand either Greek or English, and two enforcers boarded the train before the experimenter could reach them. The majority of enforcers were driven by a desire to enforce the escalators norm (74 percent –

17 out of 23 enforcers). Only 5 of the respondents stated that they were in a hurry as the sole reason for asking the violator to stand to the right (22 percent). If we ignore the six non-respondents, this evidence implies that 74 percent of the instances where the escalators norm was enforced reflected costly norm enforcement. We could therefore say that costly enforcement occurred in 14.3 percent of cases (19.3 percent x 74 percent). This rate is still more than three times higher than that in the case of the non-littering norm (4 percent). We therefore conclude that this explanation cannot fully account for the higher rate of enforcement of the escalators norm.

*NORM VIOLATION AS A SIGNAL OF SOCIALITY*: Another possible explanation for the difference in enforcement rates is that observers believe that the violators of the two norms are somehow different. Most individuals are likely to be aware of the norm of non-littering, given that it is universal. Therefore, an individual observing a violation of the non-littering norm may reasonably believe that the violator is aware that she is violating a norm. What kind of person behaves in a way they *know* will bother most people? The answer is, probably, a person that disregards others or even wishes to provoke them. Observers of such violations may reasonably infer that the violator generally disregards social norms and conventions. Therefore, an effort by an observer to enforce the norm in this case is more likely to trigger counter-punishment. In contrast, the fact that the escalators norm is environment-specific means that some individuals (e.g., those using the subway system infrequently) may not be aware of the norm and, hence, violate the norm *unknowingly*. In other words, an observer may reasonably expect that the violator of the non-littering norm is more likely to be anti-social and counter-punish, than the violator of the escalators norm. This means that the expected cost of enforcing the non-littering norm is higher.[18, 19]

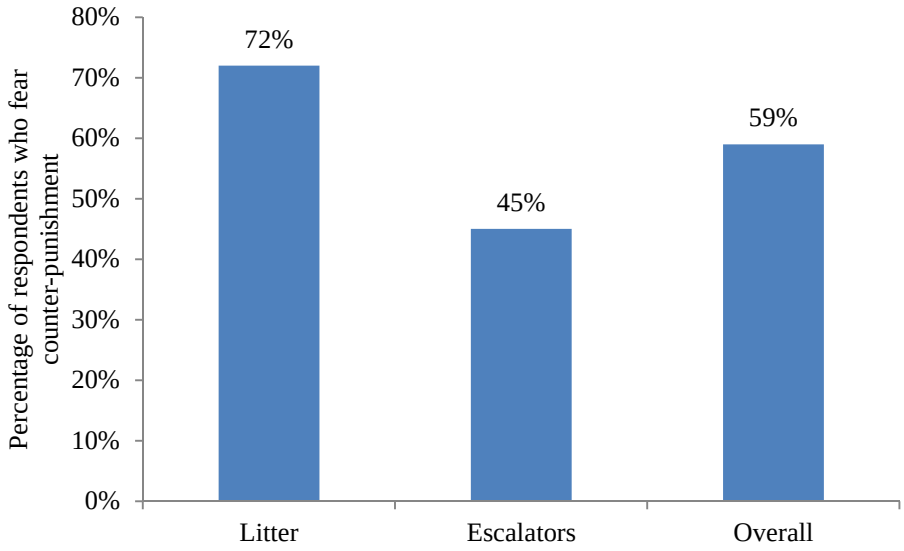
To investigate whether this explanation can account for some of the difference in the rates of enforcement, we turn to the evidence from the second survey. When responders were asked about the share of passengers they believed was aware of the non-littering norm, 89.3 percent of them indicated their belief that “most” or “all passengers” were aware of the norm. In

[18] A number of experimental studies have shown that as the cost of punishment increases, the willingness to punish declines (Anderson and Putterman, 2006; Carpenter, 2007; Egas and Riedl, 2007; Nikiforakis and Normann, 2008).

[19] Nikiforakis and Engelmann (2011) provide evidence from a laboratory experiment in line with this explanation. They find that, when punishment in a public good experiment can lead to a long sequence of punishment and counter-punishment, extreme free riders are *less* likely to be punished than less extreme free riders. They also find that extreme free riders are more likely to counter-punish.

contrast, only 33.3 percent of respondents believed "most" or "all passengers" were aware of the escalators norm. Therefore, violations of the non-littering norm may be more likely to be perceived as *intentional*. As can be seen in Figure 2, in line with the reasoning outlined in the previous paragraph, the percentage of individuals who fear that punishing a norm violator could trigger counter-punishment (the main reason for not enforcing a norm; Result 2) is substantially larger in the case where the violator litters than in the case where they stand on the left side of the escalators. In particular, 71.9 percent of respondents stated that they would fear being counter-punished by an individual who litters. In contrast, 45 percent of respondents stated that they would fear counter-punishment by an individual who stands on the left side of the escalators. The difference is statistically significant ($p$-value=0.01, chi-square test).

**Figure 2: Percentage of respondents who stated they would not punish norm violators out of fear of counter-punishment.**




The relationship between the perceived intentionality of the violation and the propensity of the observer to punish a violator can also be found at the individual level. In particular, conditional on an individual being bothered by the violation, the greater the share of passengers a responder believed to know the norm, the *lower* was the probability they would enforce the norm (Spearman rank correlation coefficient; $\rho$ = - 0.18; $p$-value = 0.034; $N$=137).[20] This explanation, therefore, can account, at least partly, for the lower rate of enforcement of the non-littering norm.

[20] The relationship is stronger if we take into account respondents who stated that they would confront the violator, but would not insist if the latter ignored them ($\rho$ = - 0.30; $p$-value < 0.001; $N$=137). Similarly, the

*ENFORCER'S INTENTION*: A related explanation to the one above is that the violators may perceive differently the intentions of an enforcer. An individual who punishes a litterer undoubtedly wishes to "teach them a lesson". This may be something that angers many individuals and, therefore, makes them more likely to counter-punish. On the other hand, an individual who punishes someone who stands on the left side of the escalator may do so because they are in a hurry and not because they wish to "teach a lesson" to the violator. Therefore, the violator may be less likely to counter-punish. This explanation is consistent with the findings presented above, that is, that litterers are perceived to be more likely to counter-punish. Our survey evidence does not allow us to distinguish between this explanation and the one above stating that violations are a signal of sociality.

*THIRD VS. SECOND PARTY PUNISHMENT*: Another explanation for the different rates of enforcement could be that the enforcement of the non-littering norm is more like "third-party" punishment, while enforcement of the escalators norm is more like "second-party" punishment. The difference between the two types of punishment is that third-party punishment is triggered by a violation that affects the punisher indirectly, while second-party punishment is triggered by a violation that affects the punisher directly. If this was the case, based on laboratory evidence (e.g., Fehr and Fischbacher, 2004), we would expect that observers of violations of the non-littering norm would be *less* bothered than observers of the violations of the escalators norm. However, as we saw in section 3, this is not the case in our experiment. Therefore, this explanation does not seem to be able to account for the difference in enforcement rates across the two norms.

*PEER PRESSURE*: Another explanation for the different enforcement rates is that observers of violations on the escalators may feel compelled to punish as they know that others behind them rely on them to enforce the norm. While we cannot completely rule out this possibility, we note that none of the enforcers or survey respondents gave us this reason for punishing the violator.

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relationship is strengthened, if we restrict our analysis to those respondents who said they would be bothered "quite a lot" or "a lot" from the norm violation. The greater the share of passengers a responder believed to know the norm, the lower was the probability they would enforce the norm ($\rho$ = - 0.24; $p$-value = 0.017; $N$=102).

## 4. Discussion

We have presented results from a natural field experiment investigating whether individuals are willing to enforce social norms at a personal cost in one-shot interactions. The propensity to adhere to social norms in one-shot interactions and to cooperate with strangers has been a long-standing puzzle for economists and other social scientists. An explanation that has received considerable attention recently is the willingness of individuals to engage in costly enforcement even when they cannot anticipate any direct benefits from their actions. The supporting evidence for this explanation comes from laboratory experiments demonstrating that most participants are willing to sacrifice part of their earnings to reduce those of others in one-shot interactions. However, costly punishment appears to be extremely rare in observational field studies, thus raising the question of whether costly punishment occurs and can explain adherence to social norms in one-shot interactions in daily life (Guala, 2011).

Consistent with laboratory evidence, we have found that some individuals are willing to enforce norms at a cost in one-shot interactions. These individuals, however, are only a minority. The main reason for individuals' unwillingness to punish norm violators in our experiment appears to be the fear of counter-punishment by the violator. In addition, we found that men are more likely to punish violators than women, while the height and the gender of the violator do not seem to affect the likelihood of norm enforcement.

The fact that some individuals are willing to punish norm violators even in one-shot interactions in the field can help explain adherence to social norms in daily life. While norms were enforced by a minority of individuals in our experiment, it is worth mentioning that the norms we studied appear to be widely adhered to by the population investigated.[21] Our experiment was not designed to address the extent to which adherence to the two norms is due to the observed willingness to punish norm violators, since violations were exogenous. However, the wide adherence to the two norms suggests that the observed rate of enforcement may be sufficient – indeed, optimal – to maintain social norms once they have been firmly established.

Apart from presenting the first evidence for the use of costly punishment in one-shot interactions in the field, our study also provides some interesting, novel insights into the

[21] In the four days during which the experiment was run, we witnessed no violation of the non-littering norm (or any evidence of littering), and very few violations of the escalators norm. It is also worth mentioning that 90.9 percent of the observers who did not enforce the norm proceeded to walk up the escalators once the violator stepped to the right. This shows that individuals adhered to the escalators norm even after they observed others violating it.

determinants of norm enforcement. In particular, we found that the better known of the two norms (non-littering) is substantially less likely to be enforced through punishment. This is despite the fact that individuals claim to be more bothered by these violations. Our survey evidence suggests that this is at least partly because violators of well-known norms are considered to be more likely to counter-punish. However, other factors could also account for this difference. Future research could investigate these factors and the robustness of our findings using different norms to the ones we studied and different populations. Given the wide adherence to the non-littering norm despite the low enforcement rate, it may be also interesting to investigate how costly punishment interacts with other means for promoting adherence to norms, such as indirect reciprocity (e.g., Rockenbach and Milinski, 2006) and campaigns to increase norm awareness.

Another question that seems worthy of future investigation is examining why the rate of enforcement in our experiment is substantially lower than that in laboratory experiments. Presumably, there are many reasons. The absence of counter-punishment opportunities in most laboratory experiments is clearly an important reason as suggested by our survey evidence. However, this factor cannot account fully for the difference in enforcement rates as the majority of individuals seem to still use costly punishment when counter-punishment is possible in the lab (Nikiforakis, 2008; Nikiforakis and Engelmann, 2011). Based on our surveys, we believe that punishment may be considered to be more costly in the field, as angry violators can cause physical or psychological damage to enforcers. It is also possible that individuals who violate norms are (or consider themselves to be) better at retaliating than those who do not. This also increases the cost of norm enforcement and may thus lower the frequency with which norm violations are punished. Another explanation for the higher rate of enforcement in the laboratory may be the fact that at the start of the experiment a clear social norm usually does not exist or has not been established, and individuals, in the absence of other means for enforcing cooperation, may be more likely to use costly punishment when a norm is not well established. Understanding the reasons behind the difference in enforcement rates in the field and in the laboratory will yield insights into the determinants of costly punishment and how it can support norms of cooperation.

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# Appendix

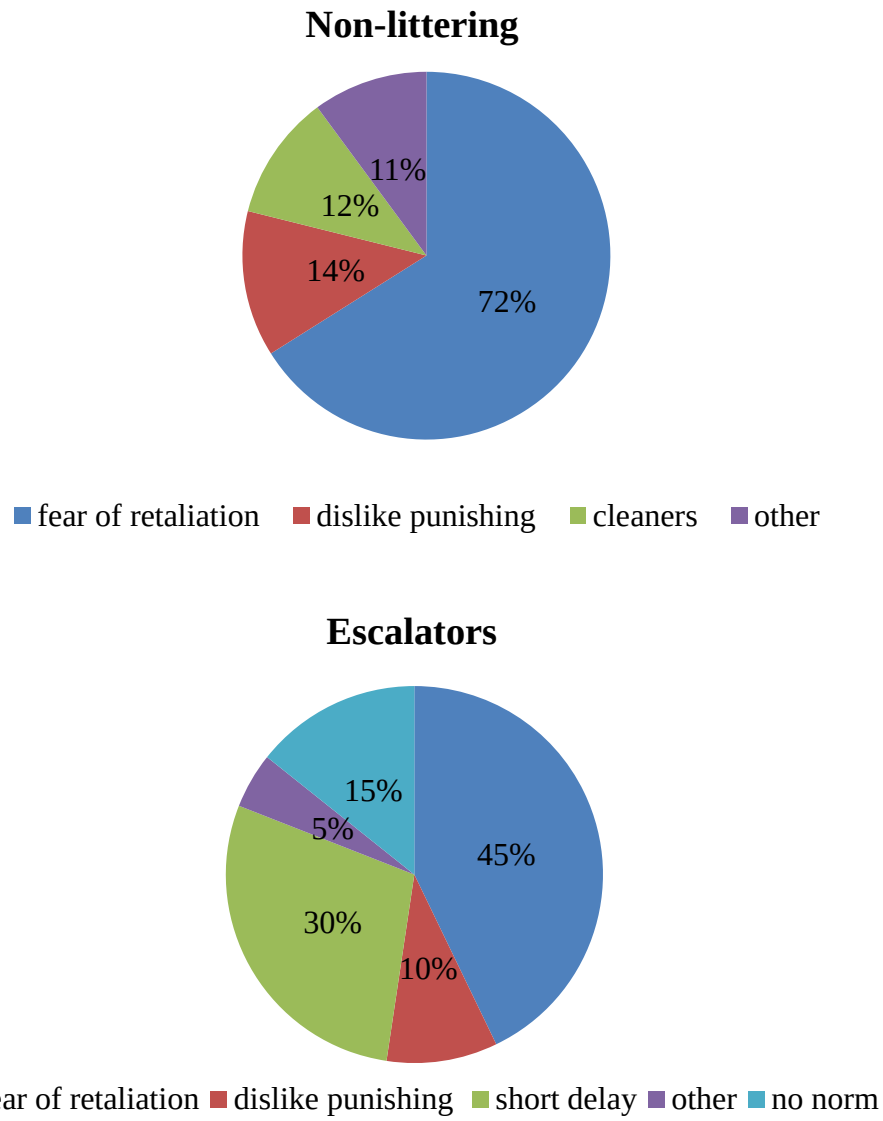
**Table A1 – Enforcement rates in Herrmann, Thöni and Gächter (2008)**[a]

| City | % of subjects punishing at least once | % of punishment cases aimed at free riders[b] | % of subjects punishing at least once, periods 6-9 | % of punishment cases aimed at free riders[b], periods 6-9 |
|---|---|---|---|---|
| Athens | 88.6 | 62.8 | 79.5 | 63.3 |
| Bonn | 78.3 | 69.8 | 45.0 | 63.5 |
| Boston | 58.9 | 72.8 | 17.9 | 86.2 |
| Chengdu | 90.6 | 72.8 | 54.2 | 70.2 |
| Copenhagen | 67.7 | 64.3 | 27.9 | 58.5 |
| Dnipropetrovs'k | 86.4 | 63.0 | 77.3 | 67.4 |
| Istanbul | 89.1 | 62.6 | 67.2 | 65.2 |
| Melbourne | 82.5 | 69.9 | 50.0 | 63.1 |
| Minsk | 76.5 | 58.7 | 55.9 | 56.5 |
| Muscat | 90.4 | 49.3 | 76.9 | 50.2 |
| Nottingham | 82.1 | 76.5 | 44.6 | 66.7 |
| Riyadh | 79.2 | 59.4 | 56.3 | 56.9 |
| Samara | 89.5 | 61.2 | 75.7 | 64.7 |
| Seoul | 84.5 | 68.1 | 58.3 | 68.8 |
| St. Gallen | 79.2 | 66.0 | 44.8 | 65.3 |
| Zurich | 82.6 | 69.4 | 51.1 | 69.5 |

[a] Note that Herrmann et al. (2008) use a fixed matching protocol. However, while the matching protocol sometimes affects the extent of punishment (conditional on punishment being meted out), the *rate* of punishment, which is of interest to us, does not typically differ across fixed and random matching protocols. For some supporting evidence see Table 4 in Nikiforakis (2008) and the evidence discussed in section 2.

[b] The term "free rider" refers to individuals who contributed less than the average of the group.

**Figure A1 – Respondents' reasons for not enforcing a norm**




Note: There were 75 respondents for each norm. Of them, 74 (non-littering) and 63 (escalators) said that they would be *at least* "a little" bothered by the violation of the norm. Of these individuals, 57 (non-littering) and 49 (escalators) said that they would not enforce the norm. Figure A1 presents the reasons provided by these individuals for not enforcing the norm as a percentage of these respondents. The figure lists separately responses that were provided by at least 10 percent of these respondents. The other reasons are classified as "other". As multiple answers were allowed, the sum of the percentages exceeds 100. Most of the responses (fear of retaliation, dislike punishing, no norm) are self-explanatory. "Cleaners" means that respondents did not enforce the non-littering norm as they believed that specialized staff would clean up. "Short delay" means that respondents did not enforce the escalators norm as they found the delay/externality caused by the violation to be insufficient to justify punishment.

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Norm enforcement in the city: A natural field experiment

**Abstract**
Extensive evidence from laboratory experiments indicates that many individuals are willing to use costly punishment to enforce social norms, even in one-shot interactions. However, there appears to be little evidence in the literature of such behavior in the field. We study the propensity to punish norm violators in a natural field experiment conducted in the main subway station in Athens, Greece. The large number of passengers ensures that strategic motives for punishing are minimized. We study violations of two distinct efficiency enhancing social norms. In line with laboratory evidence, we find that individuals punish norm violators. Men are more likely than women to punish violators, while the decision to punish is unaffected by the violator's height and gender. Interestingly, we find that violations of the better known of the two norms are substantially less likely to trigger punishment. We present additional evidence from two surveys providing insights into the determinants of norm enforcement.

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