WHEN CONTEMPT CAUSES ANIMOSITY

How Criminals Perceive Criminal Deterrence

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Abstract

      Criminal behavior escapes general explanations as difficulties arise in interpreting its motivating factors. This paper hypothesizes that aspects of criminal deterrence such as law enforcement may not always show strong mitigating effects on crime. Specifically, through theoretical research and analysis with evidence provided through statistical experimentation, the following project speculates that deterrence practices become counterproductive as punishment policies become overly severe and inconsistent. We furthermore articulate that an effective way of analyzing both the mitigating and motivating factors behind crime involves taking the perspective of a potential law breaker.

Introduction

      Criminal activity represents one of humanity's most frustrating issues through its damaging nature and the complications in attempting to deter it. The issue of crime becomes one of the world's most burdensome dilemmas because of its destructive potential and the difficulties in understanding and agreeing upon its underlying causes, which remain debatable despite frequent attempts to interpret them. One cannot however reasonably argue that criminals do not represent a legitimate threat to societal well-being, so further attempts to alleviate their damaging capabilities becomes a point not only of vast intrigue but also of severe importance. The theory of rational choice common in microeconomic theory will serve as a basis of investigating individual decision making, and stipulates that one will become a criminal if they determine that the benefits in doing so overrule those inherent in a legal lifestyle. It follows that mitigating illegal activity requires the reduction of its perceived profitability in the view of those who may execute it, so it becomes paramount to take the perspective of a possible law breaker in order to investigate the effectiveness of criminal deterrence. This paper will therefore analyze current deterrence policies set forth by criminal justice and law enforcement by interpreting them through the perspective of potential criminals. The analysis of deterrence requires examining its aspects present not only in current law enforcement practices but also those existing in societal conditions, as they both play a significant role in increasing and decreasing criminal incentive. How criminals perceive circumstances in their environment and methods of law enforcement will therefore become the primary means of scrutinizing current deterrence practices.

      Positivist criminology typically utilizes conceptual and empirical methods of investigation, with both carrying genuine merit. Which holds more value becomes a source of debate amongst those in the field, and this project will take the view that quantitative studies such as statistical examination generally become relevant through the provision of evidence for concepts discovered through more theoretical research. Thus the consideration and analysis of both theoretical and empirical concepts following the literature review will become the means with which this paper will attempt to analyze how factors of deterrence influence criminal incentive. We speculate that the aspects of law enforcement and criminal justice may be divided

based on three different but not necessarily conflicting concepts: the severity of punishments, the probability of apprehension, and the consistency in administering sanctions. These three factors will influence how individuals utilize their capacities of rationality in order to either embrace or abstain from a criminal lifestyle. We must also recognize that not all criminal deterrence results from law enforcement practices, and will therefore also consider how broader societal and environmental aspects may either impede or instigate crime. This paper hypothesizes that law enforcement and criminal justice policies in their current states, while not completely ineffective, represent largely flawed systems of criminal deterrence. While high probabilities of arrest may show strong deterrent effects on crime, overly harsh and inconsistent levels of punishment do not and may even serve to instigate it. Furthermore, adverse environmental circumstances will generally show positive relations to crime rates. The empirical analysis section will utilize a generalized linear model to investigate possible associations between convictions and punishment policies in the forms of sentence lengths and monetary fines, and we will attempt to find evidence for our hypothesis that criminal sanctions might not show strong mitigating effects crime when they reach high magnitudes.

Crime and Rational Choice

The theory of rational choice should be explained before expanding upon its significance to crime. It illustrates an instinct central to human nature: survival in a competitive atmosphere. People make choices in order to maximize their personal satisfaction, but it becomes important to note the subjective nature of the word "satisfaction." Individuals weigh their happiness relative to others in their immediate environment, and only consider themselves happy or fulfilled if they believe that they benefit from life equally to or more so than their peers (Gladwell, 2013). Considering criminal propensity through the rational choice model requires awareness to the notion that people make decisions in order to maximize utility in a competitive world with limited resources. Some decide that the criminal path gives them an advantage in this endeavor, at which point abidance to the law can become at least somewhat of an afterthought.

Rationality levels vary throughout specific individuals and don't always correspond to intelligence, although the two may show correlations (Kahneman, 2011). Therefore the rational choice doesn't necessarily equal the intelligent choice, and more rational people may show stronger propensities towards risk aversion than others. This implies that the expected utility of certain decisions will differ according to the person, along the lines of microeconomic theory utilizing the Neumann-Morgenstern utility function. In extreme risk-perverse cases some may view opportunities strictly in regard to their potential payoff without any consideration for possible risk factors. This type of individual often becomes likely to engage in criminal activity if they see considerable satisfaction in the rewards. The following function represents the expected utility in executing a criminal action (Eide, 1994):

$$E[U] = PU(Y - f) + (1 - P)U(Y)$$

In which:

U(*) = the individual's Neumann-Morgenstern utility function
E[U] = the individual's expected utility
P = the subjective probability of failure
Y = the monetary and psychological reward
f = the monetary equivalent of the punishment

It is imperative to note the subjective nature of the probability of failure; in other words, that the *perceived* probability does not necessarily equal the *actual* probability as different individuals will carry varying expectations depending on their propensity towards risk aversion. One must also note the subjective nature of the reward's magnitude, as it represents a matter of individual tastes and preferences. Economists often use a similar expected utility equation in assessing questions of consumer choice, but it also becomes prevalent in evaluating criminal propensity. As previously mentioned criminals, like generic consumers, make choices through considering their possible options. When a consumer decides upon a specific basket of goods, they assess the significance of the basket itself in regard to the cost of acquiring it. This differs depending on the specific person, and may be illustrated by examples such as the decision to buy groceries. It requires assessing the value of the dollars lost in regard to the groceries gained, which varies depending on relative levels of wealth, hunger, etc. Here it becomes important to consider the differences between perceived and actual values. A bag of rice may cost five dollars- this represents its *actual* value. The *perceived* value depends on the consumer's tastes and preferences relative to their individual circumstances. A starving rice fanatic may see the product as worth more than five dollars and someone less enthusiastic may bestow a lower appraisal. In this example consumers will also vary in their perceptions of the value of money, as five dollars will become more valuable to some and less to others depending on their specific circumstances. The probability of failure, *P,* in this case equals the chances that the consumer will regret their purchasing decision and the monetary punishment, *f*, equals the money lost. The reward, *Y,* equals the overall value placed on the bag of rice. Using the equation the person will only buy the rice if the value of *E[U]* becomes positive, meaning that the potential utility of the reward overcomes the risk of failure. Therefore the person who buys the most rice will theoretically place a very high value on rice and a similarly low value on dollars.

To apply a criminal component to the above example, consider the case in which the consumer decides to not pay for the bag of rice and steal it instead. In general one would only do so if the predicted utility from criminal activity exceeds that from legal action, which becomes another exercise in assessing rationality. The value of the reward will now change based on the person's criminal propensity, as some may view the act of shoplifting as intrinsically satisfying. They therefore gain not only the rice itself but also the experience of stealing it. Some steal out

of necessity as they lack the necessary funds to pay for the stolen merchandise, and the value of food becomes inflated for those suffering from poverty. The perceived probability of success now equals the chances that the thief will avoid detection, as opposed to the chances that they will not regret the loss in dollars due to paying for the stolen goods. Many reasons exist as to why one would consider criminal behavior as an effective, and possibly necessary, means of achieving their goals.

Before continuing, this project would like to offer a slight revision to the presented expected utility function. Criminals, like all individuals, don't typically exhibit such accurate judgment when assessing risks relative to rewards (Kahneman, 2011). More specifically, the probability of failure does not always equal one minus the probability of success. For example an extremely risk averse individual may determine that the probability of success only equals 5%, but this does not necessarily imply that they estimate the probability of failure at 95%. Although the difference is often very subtle, they may view the chances of failure as high as 99.9% although they don't view success as a .1% probability. In other words it is possible for one to be cautiously and perhaps overly optimistic about their chances of success, while still recognizing and acknowledging the possibility of failure. The human brain is not a perfect computer and this paper hypothesizes that due to the flaws inherent in human cognition, an individual may hold disproportionate perceptions in regard to their chances of success relative to failure. The consideration of a flawed sense of rationality in individual decision making becomes crucial in evaluating criminal propensity. The revised model:

$$E[U] = P_F U(Y - f) + P_S U(Y)$$

In which:

$U(*)$ = the individual's Neumann-Morgenstern utility function
$E[U]$ = the individual's expected utility
P_F = the subjective probability of failure
P_S = the subjective probability of success
Y = the monetary and psychological reward
f = the monetary equivalent of the punishment
(note that $P_S + P_F$ doesn't necessarily equal 1)

Aspects of Deterrence

The perceived probability of success is typically determined by deterrence theory, which denotes criminals as rational beings who respond to potential costs such as legal punishment (Barkan, 2009). These policies must exist within society in order to diminish some of the

benefits perceived in crime, but contrary to some conventional thought increased levels of punishment do not always correlate to decreased levels of crime. Levitt and Dubner (2005) argue that severe enough punishment could probably eliminate almost any unwanted action, but could also provoke significant and counterproductive opposition. One must deem authority fair in order to respect it, and people question the legitimacy of overly harsh policies (Gladwell, 2013). A perceived lack of integrity in the law can give rise to defiance, but extremely modest punishment almost completely eliminates the costs in unlawful behavior (Ristroph, 2009). An optimal level of deterrence should therefore involve establishing an appropriate balance between moderate and severe levels of punishment. It is also possible that existing threats of persecution simply cannot deter certain criminals (Becker & Posner, 2009). Some people perform illegal actions seemingly regardless of consequences, and their punishment only sets an example to deter others with criminal dispositions (Erikson, 1966).

It also becomes significant to distinguish between the probability and severity of punishment. Criminal action will decrease if the chances of apprehension increase, with little to no counterproductive consequences as the probability reaches very high levels (Eide, 1994). Punishment polices can become overly severe, but not overly probable. High probabilities of punishment only become counterproductive once people are wrongly arrested for menial action or complete innocence. Assuming that all arrests only occur in appropriate situations, the certainty of detection and apprehension typically shows stronger deterrent effects on crime rates than the severity of punishment ("Five Things about Deterrence," 2014). Therefore criminal justice policies ought to consider heightening the probabilities of arresting wrongdoers instead of increasing the harshness of sanctions.

The analysis of deterrence practices must also consider consistency in the methods of punishment. If the judicial system deems that certain actions warrant discipline, then the degree of penalty ought to remain steady not only for the specific crime but throughout multiple offenses. For example, consider criminal actions on a scale of one to ten, with ten being the most severe (e.g. murder) and one being the least (e.g. loitering). When evaluating the sanctions administered for both crimes on a similar one to ten scale, the punishment for murder should be of the highest reasonable severity (ten) while that for loitering should be relatively minor (one). If the person who loiters receives the same sentence as the one who murders, the judicial system loses credibility in the eyes of the public. The same effect occurs when two people convicted of the same crime, no matter what it is, endure significantly different forms of punishment. Note that this maintains that no sanctions should become overly harsh under any circumstances. This specific example involving loitering and murder is very extreme and impractical, but inconsistencies in convictions do occur in smaller magnitudes. To draw from a recent real-world example, the National Football League recently caused public confusion and controversy through its decision to enact harsher penalties on players who consume marijuana than on those who

physically abuse their fiancés. The consistency of punishment deserves as much attention and criticism as the severity and probability.

Even if deterrence practices sometimes become suboptimal, many empirical studies conclude that even imperfect policies have an effect on mitigating crime (Winter, 2008). A specific study in Italy after the passing of the Collective Clemency Bill, which released all prisoners with less than three years remaining on their sentences, found that most of them (over 84%) never fell back into trouble with the law (Drago et al., 2009). Although the authors interpret this as evidence in favor of the deterrent effects of imprisonment and its role in mitigating recidivism, it is important to note that several underlying factors may explain reasons behind this other than the incapacitation and rehabilitation aspects of Italy's prison system. These include the ages at which the prisoners were released and changing aspects of the social context. But even if we do not assume that Italy has close-to-optimal criminal justice policies, the fact remains that spending time in prison does not appear favorable to the vast majority of the world's population. Deterrence policies throughout the world rightfully deserve criticism, and in certain communities (i.e. Ferguson, MO) they may actually spur crime rather than deter it due to counter-productive actions such as police brutality. We cannot however ignore the simple truth that in most cases imperfect methods are still better than nothing at all in regard to diminishing crime rates, but should still recognize that improvement ought to remain a priority whenever possible.

Criminal deterrence also manifests itself in ways outside of law enforcement and justice policies, such as in environmental and social contexts. Circumstances inherent in an individuals' surroundings and gained through life experiences provide moral context in which they make choices (Wikstrom & Svensson, 2010). Those exposed to adversity and injustice such as parental abuse, racial profiling, police brutality, or the failure of the law to convict the murderer of a loved one may develop a distorted sense of morality. These detrimental circumstances can develop distrust and disrespect for authority figures and societal norms in certain individuals (Gladwell, 2013). If environmental circumstances can impact an individual's sense of morality, then those exposed to more damaging situations could naturally develop a flawed impression of righteousness. Furthermore, these experiences may often lead to desperation and a reduced capacity for risk aversion.

Along these lines, some evidence suggests that the social environment can often greatly influence the individual or even override his or her personal dispositions, with either positive or negative repercussions (Gladwell, 2000). In one experiment officials found that fixing broken windows and cleaning up graffiti led to decreased crime rates in some destitute, crime-ridden neighborhoods. Other studies attempting to assess this Broken Windows Theory have also found that visible evidence of illegal activity may strengthen or increase criminal tendencies, suggesting that crime often takes an epidemic quality. We may find similar effects if we consider

the broader cultural environment, which could partially explain why Japan possesses one of the lowest rates of homicide in the world along with its close-knit social structure and values on community (Komiya, 1999).

Cognitive Imperfections

Because criminal activity often becomes influenced by cognitive functionality, the analysis of criminal deterrence must recognize the differences between *perception* and *reality* in regard to severity, probability, and consistency of punishments, as well as environmental circumstances. A potential criminal may perceive possible punishments for potential transgressions, but these judgments may not necessarily reflect reality. The notion of inaccuracy in anticipating circumstances holds true for all aspects of criminal deterrence, so it becomes especially important to recognize possible imperfections in human cognitive abilities. This becomes even more crucial when investigating criminals in particular, as individuals who come of age in crime-inducing environments may develop particularly distorted rational capabilities. One will only commit a crime if they *perceive* it as the right choice to maximize their personal utility, an outcome largely determined by aspects of criminal deterrence.

One's understanding of their environment may become subject to similar cognitive imperfections. In 2012, 4.8 murders occurred within the United States per 100,000 people ("FBI Uniform Crime Reports"). Although 0.0048% does not seem to represent an immensely high probability, one should contemplate it whilst also considering the US population. Doing so leads to the realization that 14,827 murders occurred that year in the United States, or one every 35.4 seconds ("FBI Crime Clock Statistics," 2012). We should therefore recognize that although murders represent tragic events worthy of anguish and antipathy, the probability of their occurrence is not miniscule to the point that we should meet every single one with astonishment. However, while the probability of a murder occurring is not microscopic, it is still very small. While a 0.0048% chance does not appear infinitesimal after adjusting it for the whole population, 14,827 does not seem like a large number upon understanding that 318,912,000 people live the United States. This leads us to a human cognitive bias in regard to mathematical reasoning: small percentages may only appear negligible and large numbers gargantuan until accounting for the entire sample size (Kahneman, 2011). Without immediately revealing the whole population size, one would generally shrug if told that a 0.0048% chance exists that they may be murdered. However, again before disclosing the entire population size, if one learned that 14,827 people were murdered in the past year then they'd probably feel some degree of anxiety. These represent two very different ways of reporting the same fact, which are met with two very similarly distinctive reactions. Those with the conviction that they inhabit a hazardous environment will often overstate the nation's murder rate as confirmation of their perception. Many take their impression that murders and other crimes occur frequently as indication that

they do not constitute highly indecent actions, and therefore they become justified as morally acceptable. A conviction of hostility in one's environment can often lead to antipathy in one's disposition.

We must also recognize other biases in regard to one's perception of their environment. Take for example the case in which a guilty murderer, i.e. George Zimmerman, is acquitted of his charges and declared innocent. Distortions now occur in regard to peoples' perceptions of deterrence and other environmental circumstances, and close examination of their rationality reveals that they may not necessarily be justified. Again returning to 2012, the year of Trayvon Martin's murder, 73% of total murders resulted in arrests ("FBI Uniform Crime Reports," 2012). Nothing unusual occurred in regard to Zimmerman's probability of apprehension- as is the case with most murderers, he was arrested. However, note that 27% of murders not resulting in apprehension also represents a significant percentage. It is also worth recognizing that 2,800 prisoners were sentenced for murder under federal jurisdiction in the prior year, 2011. In this year 10,832 murderers were arrested within the United States, so approximately 26% of all murderers received a sentence under federal jurisdiction ("Bureau of Justice Statistics", 2011). Many with intentions of personal well-being would likely prefer to see a larger percentage.

Although still deplorable, the case of George Zimmerman does not therefore appear quite as peculiar as originally perceived in regard to its probability of occurrence. As a single individual, he represents approximately 3.133e-7% of the entire US population and 0.009% of the arrested murderers in 2012. And again, note that only 26% of arrested murderers actually received a sentence under federal jurisdiction. In other words, the population of total people and murderers in particular represent large enough sample sizes such that the case of George Zimmerman unfortunately resulting in his acquittal might not represent a significant outlier. This leads us back to the differences between perceived and actual circumstances in deterrence and environmental circumstances. The murder of Trayvon Martin represents an atrocity that people should rightfully meet with sadness and aversion. However the mistrial of George Zimmerman did very little, if anything at all, to change how people should realistically view deterrence and environmental circumstances. Despite this, distortions may have occurred in peoples' perceptions towards severity, probability, and consistency of punishments, and in regard to environmental circumstances. People have killed one another without enduring penalties since the inception of humanity, and in many cases the transgressor and the victim were of different races. The singular case of George Zimmerman does nothing to change this fact. Regardless of the complaints along the lines of criminal justice not issuing punishment for a person's murder, it has done so on numerous occasions throughout history. In reality nothing changed significantly about deterrence after Zimmerman's arraignment, but perceptions do not always reflect this.

Several cognitive biases may help to explain this. The availability and recency biases allow people to quickly call to mind the case of Martin and Zimmerman as evidence that

deterrence is insufficient, and the confirmation bias allows them to use the incident to validate pre-conceived notions of the inadequacy of law enforcement. In any case, imperfections in human cognition can cause them to inaccurately judge circumstances in their environment. All tragic consequences aside, *a singular crime should not realistically and radically alter one's view towards law enforcement, criminals, or their environment.* They only become significant when allowed to culminate throughout a prolonged period of time. This notion also holds true in most cases with racial connotations.

Despite this, a single event may show effects on a person's understanding of deterrence, and a situation that should not necessarily affect judgments towards all of its aspects may in fact do so regardless. In the aftermath of Martin's shooting, many developed the perception that criminal sanctions are insufficient, improbable, and inconsistent. Truthfully this catastrophe only served as *evidence* that this is *often* the case, as opposed to *proof* that it is *always* the case. Furthermore, particular events can show effects on perceptions of more aspects of criminal deterrence than they reasonably should. To exemplify this notion we will turn to the misfortunes suffered in Ferguson, Missouri during the summer of 2014 when many justly called for the arrest of the officer who shot down Michael Brown. The shooter, Darren Wilson, presumably deserved some sort of indictment for his transgression, but did not, possibly due to the fact that he was white and a police officer. In terms of deterrence aspects, this event only directly violated probability of apprehension as he wrongly evaded capture. It only violated consistency and severity in sanctions as side effect; that is, his punishment was only inadequate and inconsistent because he avoided trial in the first place. This illustrates that the aspects of criminal deterrence are not mutually exclusive, and that singular events that should methodically only change opinions on one aspect may actually cause revisions on all of them. The facets of criminal deterrence serve to create an entire entity comprised of law enforcement, criminal justice, etc. With regard to both reality and public perception, deficiencies in one may become imperfections in many.

We will end this section by recognizing that public uproar over the murders of Martin and Brown, and the failure of the law to indict their killers, largely occurred due to the ethnicities of both the victims and the transgressors. Many believe that Martin and Brown would not have been murdered had they been white, and that even in the event that they would have been, that their killers would have actually been indicted. We will not, however, make racial prejudices a strong focus of this paper although we realize that they carry a large role in society's perception of criminal deterrence practices. We do not possess sufficient evidence to build a strong conviction that Martin and Brown wouldn't have died had they been white, or that the courts would have indicted their killers in the case that they were. We have already presented the fact that a significant percentage of murderers escape punishment, and know that their victims represent various ethnicities. As mentioned earlier, our specific argument dictates that singular crimes should only become significant in one's judgment of deterrence when they are allowed to

accumulate. We maintain that this specific notion holds true even in most cases involving racial undertones. The role of race in the analysis of crime and its deterrence holds obvious value and could become the subject of many other analyzes, but will not become a strong focus of this study in particular due to its large magnitude. We wish to avoid diving too far into the issue of racial tensions because it represents a very deep and controversial topic, and should become the theme of a whole other paper entirely.

Empirical Methods and Results

This project will utilize the "Monitoring of Federal Criminal Sentences, 2009" dataset, provided by the Inter-University Consortium for Political and Social Research (2009), in the following statistical analyses. It will furthermore use the R statistical software in order to run regressions and generate plots. By utilizing multiple regression analysis with a generalized linear model, we will attempt to uncover associations between convictions, sentence lengths, and monetary fines. Because we speculate that the effectiveness of criminal deterrence policies will weaken as the harshness of sanctions increase, we hypothesize that sentence lengths and monetary fines will show diminishing returns in regard to mitigating counts of conviction. We emphasize that they will show diminishing returns instead of strictly negative associations because criminal deterrence practices require some minimal degree of severity in order to diminish some of the perceived benefits in an illegal lifestyle. They only become counterproductive once the asperity becomes excessive. Here the number of convictions will largely represent a proxy for overall crime rates, as we will assume that they show solid (though imperfect) correlations.

We must acknowledge a few caveats before continuing. The process of the data collection represents an observational study as opposed to any sort of controlled experiment, so we may not use the results of the following study to infer causal relationships between the explanatory and response variables. This analysis means to provide evidence that relationships may exist, as opposed to proof that they do exist. We furthermore cannot guarantee a perfect process of randomization within the method of data collection, as the amount and severity of convictions, sentences, and fines in the particular jurisdictions accounted for in the dataset may not necessarily reflect those in the entire United States population. We must therefore use caution when attempting to draw inferences from this sample to larger populations, such as that of the whole country, as the associations between the variables in this dataset (consisting of 81,372 observations) may not mirror those inherent in the entirety of the US. The following study endeavors to uncover evidence in favor of the notion that increased punishments in the forms of prison sentences and fines do not always show negative effects on conviction rates, but we recognize the futility in trying to definitively prove this assumption through the following statistical analysis.

We will analyze associations between total convictions (*TOTCONVICTIONS*), sentence lengths (*TOTSENTENCES*), and monetary fines (*FINEAMOUNT*). We hypothesize that we may model *TOTCONVICTIONS* as a function of *TOTSENTENCES* and *FINEAMOUNT*. Specifically:

$$TOTCONVICTIONS = f(TOTSENTENCES, FINEAMOUNT)$$

The descriptive statistics for these variables are summarized as follows:

Variable	Observations	Minimum	Median	Maximum	Range	Mean	Std. Dev.
NUMCONVICTIONS	81372	1	1	175	174	1.4	2.206
TOTSENTENCES	81372	0	24	5760	5760	46.96	81.955
FINEAMOUNT	81372	0	0	6000000	6000000	1078	4361.397

We begin our analysis with a scatterplot depicting possible relationships between our three variables:
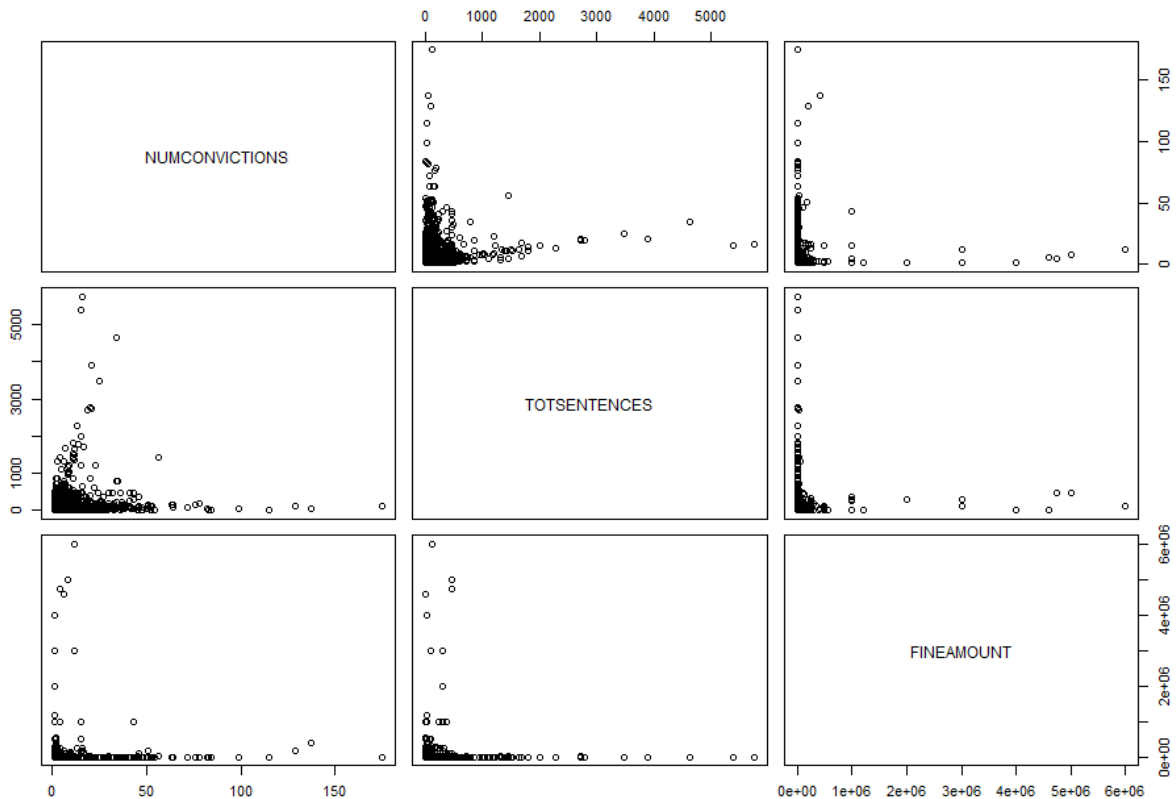
The above matrix contains six scatterplots, each illustrating the relationships between different variables plotted on the x- and y-axes. For example, the top row of the matrix contains

scatterplots with total convictions (*NUMCONVICTIONS*) on the y-axis, with the rightmost plot using fine amounts (*FINEAMOUNT*) on the x-axis. Furthermore, the entire rightmost column contains plots with fine amounts on the x-axis. We can see through this diagram that a more accurate depiction of the associations between these variables should involve logarithmic transformations of the variables due to the strong clusters of data-points around each plot's origin. Logarithmic transformations furthermore make intuitive sense in the context of this particular dataset, as they allow us to examine associations between percentage changes amongst the variables. Percentage changes allow for greater inference than unit-wise changes due to each jurisdiction in the dataset containing differing populations, along with varying proportions of convictions, sentences, and fines. For example, a $10 increase in fines will be seen as a larger increment in some places as opposed to others, and it therefore will become difficult to interpret the significance of a $10 increase in fines when investigating its association to convictions in various districts. On the contrary a 10% increase in fines is an equally large increment regardless of the jurisdiction, all else held equal, and the task of analyzing its significance throughout various districts therefore becomes greatly facilitated. The scatterplot matrix of log transformed variables follows:
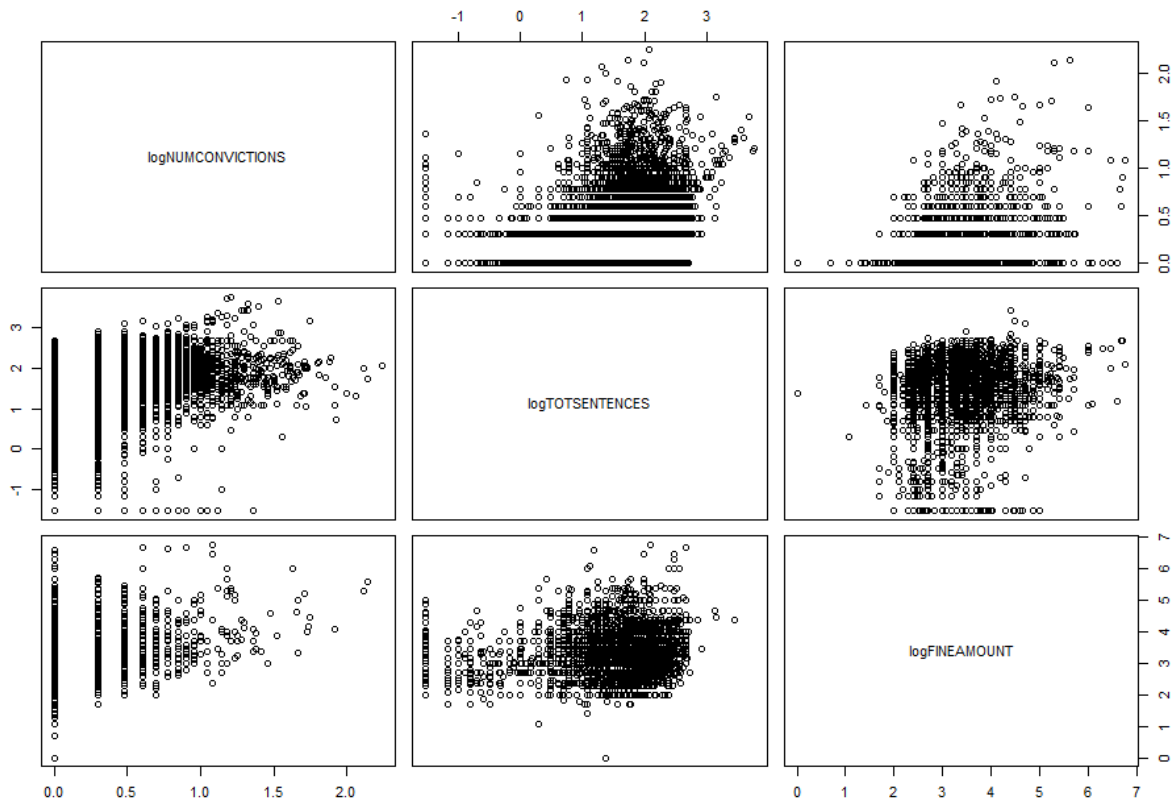
We can see through the top row of the above matrix that both sentence lengths and fines may indeed show a concave polynomial relationship in regard to total convictions, as they appear to show diminishing returns in regard to reducing the number of convictions once they reach high levels. In other words, convictions rise in accordance with sentence lengths and fines only up to certain points, and then sentence lengths and fines begin to decrease even as convictions continue to increase. This provides evidence for the deduction found through our conceptual research that punishment methods (in this case sentence lengths and fine amounts) show weaker deterrent effects on crime once they become immense (in this example convictions may serve as a proxy for overall crime rates, as we assume that the two show sufficiently strong, though imperfect, correlations).

We assume that the relationship between these variables will become difficult to model through the least-squares method of linear regression typical in econometric analysis, due to the initial un-logarithmically transformed variables showing systematic clusters about the origin when plotted against one another. Examining the density plot for each variable will help in verifying this assumption. We see through these density plots (contained in the Appendix) that each variable takes more of a Poisson than normal distribution. This would likely lead the conditional error terms of the variables in a least-squares regression model to not take a normal distribution, to not have a mean of zero, and to not show equal variances, which are all necessary conditions for conducting an least squares regression analysis. We will therefore utilize the Poisson method of regression more typically used to model count data such as this. The Poisson regression calculates the logarithm of the expected value of the response variable given linearly incremental changes in the values of the explanatory variables. We will furthermore utilize squared values of our variables to create a fitted polynomial model equation in an attempt to find evidence of diminishing returns. Our fitted generalized linear model equation therefore takes the form:

$$\log(E[NUMCONVICTIONS])$$
$$= \beta_0 + \beta_1 TOTSENTENCES + \beta_2 TOTSENTENCES^2 + \beta_3 FINEAMOUNT$$
$$+ \beta_4 FINEAMOUNT^2$$

With the regression results:

Variable	Coefficient	S. E.	p-Value
Dependent Variable: NUMCONVICTIONS			
Constant	3.670e-01	1.460e-02	<2e-16
TOTSENTENCES	2.366e-03	1.153e-04	<2e-16
TOTSENTENCES^2	-4.863e-07	5.269e-08	<2e-16
FINEAMOUNT	2.137e-06	9.801e-08	<2e-16
FINEAMOUNT^2	-4.428e-13	2.920e-14	<2e-16

We see by the negative coefficients on the $TOTSENTENCES^2$ and $FINEAMOUNT^2$ terms that the model equation does indeed take a concave polynomial form, with therefore diminishing effects of $TOTSENTENCES$ and $FINEAMOUNT$ in regard to decreasing convictions as they reach high levels. We furthermore see that the p-value for the value of the coefficients on each explanatory variable are sufficiently low enough to provide evidence of individual statistical significance even at the 1% level. We may therefore reject the null hypothesis that no relationships exist between the response and each explanatory variable. We notice that the coefficients are very low, which seems intuitively feasible given a regression model illustrating percentage changes in the response variable. Each additional year of sentencing corresponds to an approximately 2% increase in convictions and each additional dollar of fines corresponds to an approximately 0.0002% increase. It follows that a 1% increase in convictions would not occur until sentences increase by 0.5 years or fines increase by $5,000.

This regression analysis provides evidence that convictions might not increase until fines and/or sentences increase by substantial amounts, and that the increases in both fines and sentences show diminishing returns in regard to mitigating convictions when they reach very high levels. In terms of the expected utility in committing illegal activity, the perceived probability of failure increases due to deterrence policies only up to certain points, but once the policies become overly severe they may cease to mitigate the perceived benefits in crime. Note that we do not find evidence of causal relationships in this analysis due to the nature of the data collection. As mentioned in this paper's introduction, we maintain that statistical analysis usually only becomes valuable through the supplementation of evidence for theories uncovered through theoretical research. This becomes especially true when using datasets that do not provide evidence for causality due to their methods of data collection, and may not necessarily allow for a large scope of inference because of uncertainties in regard to independence and randomness of the observations. Furthermore, while we utilized convictions as a response variable due to the perception that it may serve as a proxy for overall crime, we still recognize that many crimes do not result in conviction.

We endeavored to find evidence through statistical experimentation that punishment methods specifically in the forms of sentence lengths and fines may show weak and/or diminishing effects in regard to mitigating convictions, and furthermore crime. We feel that we succeeded in this regard, although the evidence could be made more compelling through the use of data with which we have more familiarity of the collection process. This way we might gain more confidence in the scope of inference. Input in regard to the collection process would become even further ideal as it may allow for the creation of a controlled experiment. This would allow us to gain evidence of causation through statistical analysis, and to choose our variables so that we wouldn't need to utilize proxies.

Conclusion

All of our discernments lead to the proposition that law enforcement may represent one of the more significant instigators of crime in society, although it is meant to prevent it. As mentioned earlier, singular crimes and their consequences should only become significant in the judgment of one's environment and law enforcement through their aggregation. It therefore becomes important to ask why so many instances of wrongful prosecution, incorrect exoneration, police brutality, and other cases of injustice have been allowed to compile over time. An individual typically decides upon a criminal lifestyle through the deliberation of their environmental circumstances. No one person is born a criminal- their propensity towards lawfulness only becomes jeopardized through exposure to adverse circumstance (Rhodes, 1999). And little can represent a larger impediment to righteousness than incompetent authority; when those meant to provide protection from danger become the threat. Every police and judicial misstep exasperates and becomes lucid confirmation to potential criminals of the hazards inherent in their environment, and creates appeal in unlawful behavior especially when coupled with the practical and financial hardships they may face throughout a legal lifestyle. One will not discern indecency in lawlessness when the authority figures meant to renounce it did not display integrity and rectitude on their own part. Questions should rightfully arise when a person capable of baselessly murdering someone as undeserving as Eric Garner is allowed to become a police officer, a position meant to "protect and serve" the community, and then avoid punishment for the crime. Very little, if anything at all, can sway one morally and pragmatically to become a criminal more efficiently than inadequate manifestations of law enforcement and criminal justice.

Attempting to change criminal deterrence in order to gain effectiveness may start by adjusting its underlying philosophies. Its currently stated goals are to deter, rehabilitate, and incapacitate (Barkan, 2009). Convicts ideally enter prisons so that they may set a negative example to others with criminal intentions, attempt to correct themselves, and cease to represent a societal threat. However, judicial systems also carry a further and often unstated intention: retribution. Criminal justice often carries the sentiment that crime ought to represent a zero-sum game; for every negative action, there ought to be a retaliatory reaction. In other words society ought to exact vengeance for every unlawful misstep committed by its citizens, and criminals can therefore become demonized in order to facilitate the process. This does not differ vastly from how violent criminals tend to demean their victims before and after committing their crimes. Revenge, however, has not always been shown to cleanse those who suffered from a crime of their anguish (McCullagh, 2014). On the contrary, harsh methods of criminal justice tend to create in onlookers further negative sentiments such as fear and distrust. The process of outlaws committing crimes and judicial policies enacting brutal punishments may therefore lead to a cycle of criminal instigation, as the retributive intentions of law enforcement can often lead to

negative consequences such as police brutality and further criminal action. Many argue that punishment policies that become overly harsh and probable may represent crimes in and of themselves (Menninger, 1966). If law enforcement truly endeavors to mitigate illegal activity, then perhaps it should begin by ceasing its own immoral behaviors.

A sensible scrutiny of law enforcement becomes facilitated through taking the perspective of a potential law-breaker. Criminals will not become deterred simply due to governmental and societal wishes and willpower. No matter how harshly judicial systems decide to sanction wrong-doers, they will continue to persist with their illegal actions as long as they see potential benefits in doing so. People do not only profit through monetary and other tangible awards, and often seek intrinsic satisfaction when executing certain actions. Many criminals gain innate gratification through seeking vengeance against those who previously oppressed them, in many cases agents of law enforcement. The practices of criminal justice revolving around the idea of strictly punishing, as opposed to rehabilitating, criminals are incompetent and archaic. They stem from the obsolete and primitive opinion that criminals do not represent legitimate human beings but rather evil and wicked entities whose actions deserve draconian retribution. In reality brutality only leads to further brutality. Individuals subjected to forceful and sometimes overly ruthless forms of authority only develop sentiments towards disdain, which often leads to virulence. A law-abiding citizen only becomes a criminal through subjection to damaging circumstances that may cause their perceptions of reality and society to morph to the point that illegal and sometimes immoral activity gains significant appeal. Society should not seek to punish those who act with malevolence only because of societal influence, and successful criminal mitigation ought to accordingly involve attempts at rehabilitation rather than brutalization of convicted criminals. Callousness only creates anger, and should not serve as an efficient means of criminal deterrence in any type of logical society. A legitimate and honest analysis of crime, its motivators, and its deterrence requires empathy with the criminal. The flames sparked in Ferguson are still physically and metaphorically spreading throughout the rest of the nation, and provide vivid confirmation that contempt can indeed cause animosity.
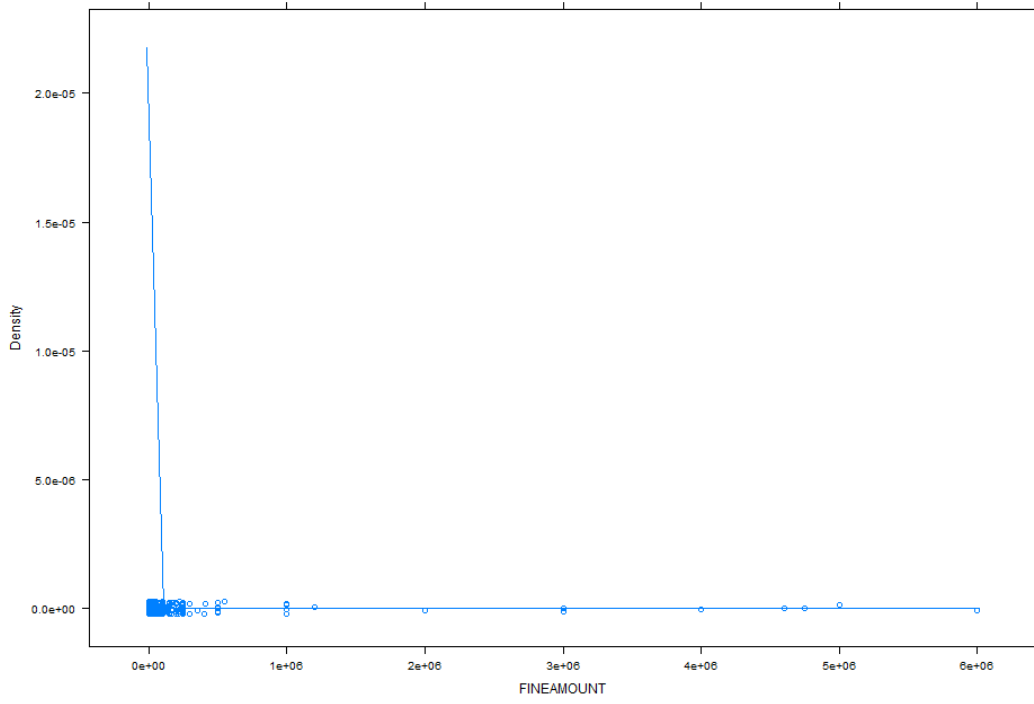
Appendix

NUMCONVICTIONS
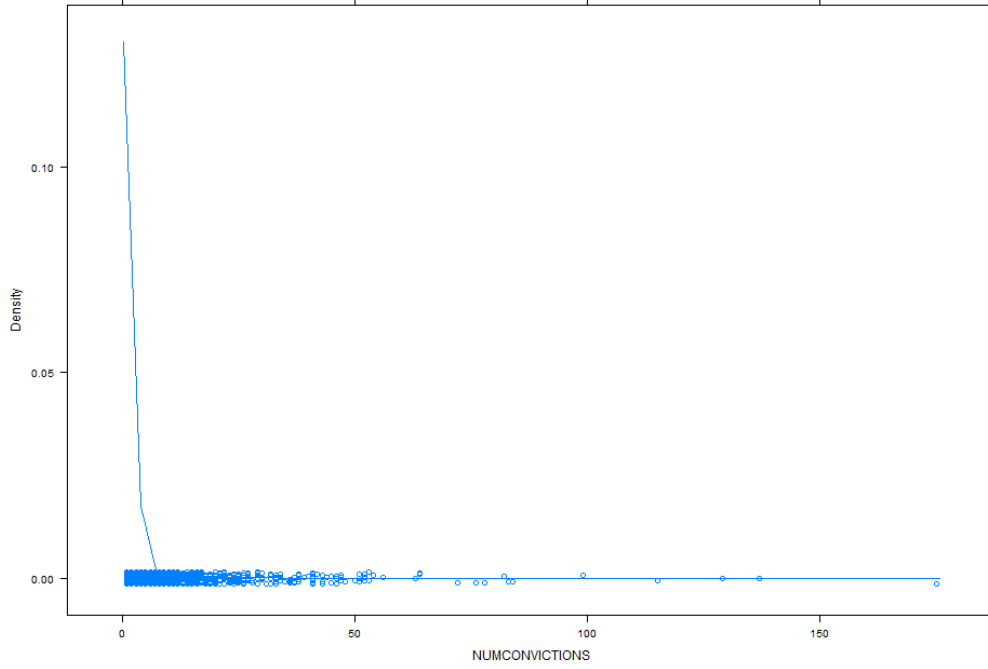
TOTSENTENCES
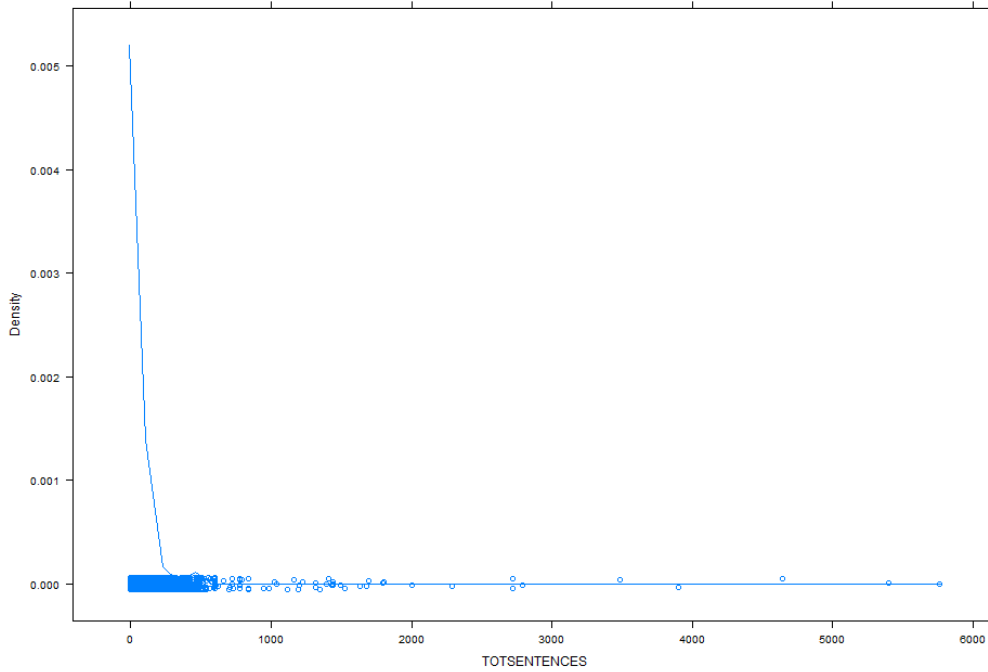
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