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Gender disparities in sentencing

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Gender disparities in sentencing

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Abstract: This paper uses the universe of convictions in France between 2000 and 2003 to document the gender gap in sentencing. It reveals three main findings. First, during this period, and after controlling for very precise descriptions of the offenses as well as other observable characteristics, women received prison sentences that were 15 days shorter, on average, than those of men who committed comparable offenses. This represents a 33% decrease relative to the average prison length in the sample (45 days in the entire sample). Second, this gender gap is also observed for mixed-gender pairs of criminals (one man and one woman) who are convicted together, on the same day, by the same person and for the same crime. Lastly, this paper presents robust evidence that the gender gap is affected by the gender of the judge, but not the prosecutor. Using the evolution of the courts' composition between 2000 and 2003, the results show that a one-standard-deviation increase in the number of women in the court decreases the gender gap by 10%.

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Introduction

Women are discriminated against in numerous important social contexts including the education system and the labor market (Bertrand and Duflo, 2017). However, the judicial system appears to treat them more favorably than men. Although women are less likely than men to commit a crime (Beatton et al., 2018; Campaniello and Gavrilova, 2018), their participation in criminal activities is slowly converging with that of men (Beatton et al., 2018). In this context, it is important to understand whether they are treated differently by the judicial system. Indeed, judicial leniency might partly explain why the number of female criminals has been increasing over time.

According to official statistics from France, Great Britain and the United States, women who commit a crime are less likely than male criminals to be arrested by the police, and are less likely to be sent to court.² Women's average sentences are also shorter.³ In 2010, according to the French Ministry of Justice, women represented 18% of defendants, but only 10.5% were taken to court, where they were more frequently discharged (6% vs. 4%, Büsch, Timbart, 2017). In that year, 8.5% of convicted women were sentenced to prison, compared to 19.9% of convicted men.⁴

In this paper, I quantify and try to understand the origins of the gender gap in sentencing. I rely on two different administrative datasets from the French Ministry of Justice. The first contains all criminal convictions in France from 2000 to 2003. For each conviction, the

² See statistics from the ONDRP (France): https://inhesj.fr/sites/default/files/ondrp_files/publications/rapports-annuels/ra-2014.pdf; Ministry of Justice (England and Wales): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571736/infographic-women-cjs.pdf; U.S. Department of Justice: <https://www.bjs.gov/content/pub/pdf/aus9010.pdf>.

³ Women represent 2–9% of the prison population in all countries: <http://www.prisonstudies.org/news/more-700000-women-and-girls-are-prison-around-world-new-report-shows>.

⁴ See “Annuaire statistique de la justice.” <http://www.justice.gouv.fr/budget-et-statistiques-10054/annuaire-statistiques-de-la-justice-10304/>.

dataset contains precise information on the type of crime – a 1,400-cell nomenclature that in turn contains all possible cases provided for by the law – sentences, criminal record, dates, place, procedural mechanisms and some socio-demographic variables (age, gender and nationality). The second dataset gives the gender composition of the 175 first instances of criminal court proceedings in France in 2000 and 2003, but not for the two years in between. Both the judges' and prosecutors' genders are available.

Using the datasets, I first document the gender gap in sentences during the study period. While the average prison sentence for men is 47 days, women receive an average of 19 days (Table 1). They also receive shorter probation periods and smaller fines, but longer suspended prison sentences. Even after controlling for all the observable characteristics – including a very precise description of the crime – this gender gap remains sizable: women receive prison sentences that are 15 days shorter (Appendix Table A1). These differences can be partly, but not fully, explained by differences in recidivism rates. While crimes for which the gender gap in recidivism rates is higher exhibit greater disparities in the probability of being sentenced to prison, the correlation with prison time is limited (if any).

Even after controlling for precise criminal categories, it is possible that some differences in crimes remain. It could be the case if, for example, men tend to commit the most severe offenses within each subcategory. In order to overcome this problem, I document the gender gap within pairs of mixed-gender offenders who are convicted together. In these situations, the charges, judges, and external context are similar for both members of the group. The gender gap measured using this strategy is even higher: men receive 38.7 additional prison days and 10.7 fewer suspended prison days (Table 2). The difference in fines is reduced.

It is still possible that the male members of the pairs exhibit observable (longer criminal records, higher number of charges) or unobservable (leadership) characteristics associated with harsher sentences. I address this concern by measuring the gender gap when *women* present observable characteristics associated with harsher sentences: a longer criminal record or more charges. In those situations, even if the gender gap is smaller or cancelled out (Table 3), women are far from being as harshly sentenced as in other heterogeneous groups (when men have the worst observed characteristics or in non-mixed groups).

While unlikely, the previous results could be driven by unobserved heterogeneity between men and women (e.g., family situation, professional status, academic level). If this were the case, the differences in sentencing should not be affected by the gender of the judges. On the contrary, if the size of the gap is affected by the gender composition of the court, it will reinforce the hypothesis of disparities in the judicial treatment of genders. I test this alternative by using the gender composition of the court.

The gender gap decreases with the share of female judges in the court: prison and probation sentences are harsher for women, while suspended prison sentences are shorter (Table 4). Fines are unaffected. An increase of one standard deviation in the share of female judges decreases the gender gap by 1.5 prison days (around 10% of the gender gap). This is because women, while not inherently harsher, tend to be harsher on other women. The gender of the prosecutors does not seem to affect differences in either sentences or pre-trial decisions (Table 5). Those results are consistent with previous studies that focused on criminal justice in the United States using a very similar approach (Schanzenbach, 2005), along with several papers in education (Carrell et al., 2009; Boring, 2017) and labor economics (Kunze, Miller,

2017). This literature demonstrates that women tend to be less affected by gender, even when this means being harsher on women.

This paper provides evidence of differential treatment for men and women in sentencing. This gap represents a lower bound of the gender gap in the judicial system: as previously mentioned, women are more frequently discharged than men. However, the results cannot be interpreted in terms of discrimination. Indeed, the harshness of the sanctions could be different – for example if prison is worse for women than for men – and the specific deterrence effect could also be different – if one prison day has a greater effect on women's than men's recidivism rates. Those aspects are beyond the scope of this paper, but if either is true, this constitutes a rational basis for gender disparities.

The rest of the paper is organized as follows. Section 1 presents the relevant literature. Section 2 provides background information on the institutional setting in France. The data and the overall gender gap are presented in section 3. The fourth section uses the composition of criminal groups to document the differences in sentencing between men and women. The effect of the judges' and prosecutors' gender on the gender gap is presented in section 5. Section 6 concludes.

1. Literature

In recent decades a growing literature has examined the pattern of gender differences in criminal participation and the way the judicial systems around the world treat offenders of different genders.

Two recent articles investigate the gender differences in crime participation rates. Campaniello and Gavrilova (2018) study property crimes in the United States between 1995 and 2015 and document a large gender gap in criminal activities. They find that women are less responsive to changes in illegal earnings, and that this lower responsivity explains up to 56% of the observed gender gap. However, this gender gap seems to be decreasing. Beaton et al. (2018) study the evolution of criminal participation by gender in Australia (Queensland) over the past 20 years and find a convergence pattern. While crime has fallen significantly among men during this period, no change has been observed among women.

A second group of papers has studied the differences in judicial responses to crimes committed by males vs. females. In the United States, several papers (Mustard, 2001; Schanzenbach, 2005; Starr, 2015; Depew et al., 2016; Butcher et al., 2017) find that women are less frequently convicted and less severely sentenced when convicted. Schanzenbach (2005) studies the interaction between the gender of the judge and the gender of the defendant, and shows that the gender gap is reduced when the judge is a woman. In a similar context, Starr (2015) emphasizes the importance of the gender gap in pre-trial decisions, particularly the fact that women are less severely charged (conditional on the arrest offence). In the UK, Bindler and Hjalmarsson (2017) analyzed the gender gap in court over an impressive 200-year period (1700–1900) and found a persistent gender gap during this time. They exclude explanations based on statistical discrimination – because the gender gap does not evolve with the proportion of women in court – or maternal responsibilities, since children are not mentioned in cases involving women. Both Schanzenbach (2005) and Bindler and Hjalmarsson (2017) interpret their result as a sign of paternalistic bias among male judges.

More broadly, these studies are situated at the frontier of two very large literatures. The first is devoted to analyzing the gender gap in different social areas. In the labor market, Kunze and Miller (2017) as well as Bagues and Volart (2010) study the probability that women will be promoted when there are more women at the next hierarchical level. In education, Carell et al. (2009) show that the gender gap in students' performance disappears when teachers are women, while Boring (2017) and Mengel et al. (2017) show that, after controlling for performance, female teachers obtain lower students evaluations than their male colleagues. The second related literature assesses optimal judicial decisions and bias. Several papers have documented the importance of race (Shayo and Zussman, 2009; Anvar et al., 2012; Depew et al., 2016), age (Anvar et al., 2014), political convictions (Anvar et al., 2015), media content (Philippe and Ouss, 2018), media pressure (Lim et al., 2012), and cognitive bias (Guthrie et al., 2002).

This paper replicates some results from previous studies on the gender gap in criminal justice systems. It adds to the literature in two ways. First, it uses a simple measure of sentence heterogeneity within criminal groups – pairs of convicted offenders. This procedure could easily be replicated to analyze other issues such as racial bias. Second, it extends the work done by Schanzenbach (2005) to include the effect of prosecutors' gender.⁵

2. Institutional setting

2.1. Procedure and sentencing in France

⁵ Farrell et al. (2010) also touched on the role of prosecutors.

This paper focuses on crimes that can be punished by prison sentences up to ten years. This criminal category – called *délits* in French – contains the vast majority of what is commonly viewed as crime: property crimes, violent crimes, economic crimes, insults, drug-related crimes and road-related offences.⁶ There were around 400,000 crimes of this type per year during the study period (2000–2003).

There is no plea bargaining in France;⁷ all sentences are decided after a trial. The courts that adjudicate the offences studied in this paper are composed of three professional judges. The prosecutor conducts the investigation (and eventually imposes pre-trial detention), decides on the charges, and uses an accelerated procedure (involving less than a week of investigation) if it is deemed appropriate. Offenders can be charged for several offences committed in a single event, for example stealing and reselling a stolen good. In this case, all charges are decided during the same event and only one decision will be made. However, as crimes are very precisely defined in the Criminal Code, multiple charges only represent only around a third of all cases (34% in 2003).

Every type of crime is characterized by a maximum prison sentence from 0–10 years. These maximum sentences are extremely rarely handed down in practice.⁸ There were no minimum sentences in France at the time of the study.⁹ The most important types of sentences are prison, probation, suspended prison, fines and community service. If individuals are charged with several offences they receive a single, aggregated sentence.

⁶ There are two other categories: (1) minor crimes that cannot be punished by prison and (2) the most severe crimes, such as murder and rape, which can be punished by very long sentences and are judged by specific courts.

⁷ A limited plea-bargaining mechanism was introduced in 2004. It remains marginal.

⁸ For example, in 2003, 49% of offenders convicted of a crime punishable by up to 10 years received no prison sentence, and 95% of those who received a prison sentence got one shorter than or equal to 4 years.

⁹ Minimum sentences for recidivists were introduced in 2007 and discontinued in 2014. Sentences are supposed to be chosen “according to the circumstances of the crime and the offenders’ personality (...) in order to protect society, to punish the offender, to protect victims’ interests and in order to promote offender’s rehabilitation and to avoid new crimes” (art. 132-24 of the criminal code, change into art. 130-1)

In this paper I focus on prison, probation, suspended prison sentences and fines. Community services are not recorded in the dataset I am using. In this paper, probation sentences are defined by the prison sentence people receive if they violate their probation.¹⁰ I treat those different sentences as independent.¹¹

2.2. Organization of the courts

As of 2007, France had roughly 5,500 judges and 1,800 prosecutors.¹² Both judges and prosecutors are civil servants, hired based on scores on the same exam, and trained in the same school. The two positions are considered the same career track with the same status. They can switch between the two roles multiple times during their career if they wish. Although the frequency is not clearly defined, judges and prosecutors are obliged to frequently move courts (every 3–4 years seems to be optimal for junior judges).

Cases are first assigned to prosecutors based on the date they are registered by the police. When the prosecutor decides the investigation is finished, he or she chooses the charge(s) and the procedure (accelerated or not). The date of the hearing for the case is determined based on the first available slot for the relevant type of charge and procedure.

The court's schedule is determined in advance on a semester basis. Judges are appointed to one session in the week. They will judge cases of a similar type – the charges and procedures are more or less precisely defined depending on the size of the court – for the entire semester.

¹⁰ Probation length is not recorded in the database.

¹¹ They are not totally unrelated, as the sum of the three should not exceed the maximum defined in the penal code. However, as mentioned previously, this not a strong limitation in practice.

¹² See https://www.courdecassation.fr/IMG/File/pdf_2007/10-05-2007/10-05-2007_mKee_fr.pdf

The prosecutor is chosen based on the date of the hearing, depending on the court's schedule and the length of the investigation. As a consequence, offenders (and their lawyers) cannot choose their judge or prosecutor.

3. Origin of the dataset and description of the observed gender gap in France

This paper uses French criminal records, collected by the statistics service of the Ministry of Justice (Sous Direction de la Statistique et des Etudes). These records contain a detailed description of every criminal case judged each year, including the date, place, and procedural details of the trial; the date of the crime, the number of charges and the exact category (based on the criminal code) of the most severe charge; the sentence decided (prison, probation, or suspended prison); and the defendant's gender, age, and nationality. Each individual is identified by a single ID (constant throughout the period). This enables an individual's penal history to be reconstructed.

The main dataset used in this paper is composed of the criminal records from 2000 to 2003. Additional years are used to build one variable recording past convictions (in the 2 preceding years, using 1998–2003) and one variable recording later convictions (in the next 5 years, using 2000–2008). This main dataset is used in the rest of this section and in section 4. In section 5, the dataset is restricted to the years 2000 and 2003 – i.e., 2001 and 2002 are excluded – the only years for which the gender composition of the court is available (see below).

Descriptive statistics for all men and women convicted between 2000 and 2003 are presented in the left part of Table 1 (columns 1 to 4). The demographic characteristics vary slightly by

gender: convicted women are older and more frequently French than convicted men. Their criminal careers diverge significantly: 32% of men have already been convicted in the last 2 years, while only 16% of the women have. This is important, since past convictions are one of the most important aggravating factors in sentencing decisions.¹³

The crimes committed are not as different as one would expect. The share of violent crime is almost equal (16% vs. 15%), even if men are usually viewed as more violent. The main differences in the types of crime committed by gender are for property crimes and road-related crimes. The former is predominant among female offenders, but the latter is more frequent among men. This structure is important, because property crimes is considered a more severe crime than road-related offenses, and is more severely punished. Regarding the severity of the crime – measured by the longest sentence allowed by the criminal code – the differences between women and men are not very important. The largest divergences are observed for crimes that could be punished by a maximum of 2 or 3 years. These two maximum punished crimes that are very similar in practice.

Even if the aggregate characteristics of the crimes are not extremely different, the trials' outcomes are. From a procedural point of view, women are judged after 30% longer investigations, and are rarely sentenced after an accelerated procedure (trial within a week after arrest) or after pre-trial detention (4% women versus 7% men).¹⁴ The difference in the length of the investigations between men and women is mainly due to the type of crime. Taking crime types into account reduces the difference in investigation length from 120 days

¹³ The average prison sentence in the sample ranges from 30 days to 77 days for offenders who have already been convicted.

¹⁴ These characteristics are associated with longer sentences. For example, offenders convicted after an accelerated procedure generally receive sentences that are twice as long (44 days vs. 105). See Christin and Lenoir 2008.

to 30 (not shown). By contrast, the difference in accelerated procedure rates between men and women remains high after controlling for crime (-3.4% reduced to -2.5%).

Women's sentences tend to be less severe. Women are sentenced less frequently than men to prison or probation (13 and 3 percentage points less frequently, respectively). Prison and probation sentences are also shorter (18 days shorter for prison and 4 days shorter for probation) and suspended prison sentences longer (8 days) for women. The difference in prison time is observed for every crime category.

The difference in sentencing between men and women could be driven by differences in offenders' characteristics. However, the gender gap in sentencing remains sizable even after controlling for all the observables (see Appendix A). Indeed, controlling for the precise type of crime (1,205 dummies), place (175 dummies), time (4 dummies for years, 12 for months), socio-demographic characteristics, type of procedure and criminal career, women have an 8-percentage-point lower chance of being sent to prison (35% reduction, compared to the 22% average in the sample), and their average prison time is 15 days shorter than that of men (33% shorter than the 44-day average in the sample). They also have a slightly higher chance of receiving suspended prison time (or probation).

The sentencing difference between men and women could have three possible origins. First, it is possible that women tend to get more lenient sentences because they are less likely to commit a new crime later on. A careful test of this hypothesis would require addressing omitted variable bias and reverse causality concerns, and is thus beyond the scope of this paper. However, it is interesting to note that, in the French context, the probability of committing a new crime after conviction does not seem to fully explain the gender gap.

Indeed, the gender gap in the probability of committing a new crime after a conviction is correlated with the gender gap in the probability of receiving a prison sentence, but not with the gender gap in the length of prison sentences (see Appendix Figure A1).¹⁵

The second possibility is that the differences between men and women that remain after controlling for crime type and other control variables could be due to unobserved variables. The severity of the crime within a criminal category, educational attainment, job, family structure, and the presence or absence of children could strongly differ between males and females. Indeed, the French criminal code states that offenders should be sentenced according to the severity of the crime, and to “the personality of the author, his material, familial and social situation” (French Criminal Code, article 13-1).

Third, the differences between men and women could come from the differential treatment of the genders by the judicial system. The following sections investigate the last two hypotheses.

4. Gender gap within criminal groups

To further investigate the gender gap, this section documents it within mixed-gender criminal pairs. Within each pair, offenders were convicted for the same crime, committed on the same day in the same place, and judged by the same court in the same external context.

The sample used in this section is a specific subsample of the main database. The gender gap within criminal groups can be different from the one observed overall, as observed by Starr

¹⁵ Controlling for socio-demographic characteristics, procedural variables or aggregate crime type fixed effects by gender does not change the absence of a correlation between the gender gap in the probability of committing a new crime after a conviction or the gender gap in the length of prison sentences (see Appendix Table A4).

(2015, p10). Thus, the external validity of this exercise is limited. However, it provides an interesting setting with smaller heterogeneities between men and women.

4.1. Identifying peer groups

Individuals are defined as belonging to the same criminal group if they were both convicted of a crime that they committed together. This information is not directly registered in the dataset, as there is no ID per criminal case. In order to identify criminal partners, I consider people to be convicted of the same crime when they are judged in the same place (175 courts), on the same date, and for the same type of crime (172 in-group crimes) that was committed on the same day.

The validity of this strategy can be confirmed by another dataset from the Ministry of Justice.¹⁶ For the period 2010–2016, this second dataset contains case IDs, which makes it possible to compare the strategy presented above to the “real groups” identified by the criminal justice system. This comparison indicates that the strategy captures 65.5% of the real groups with a false match rate of 8.5%. The remaining 34.5% of real groups that are not captured by this strategy are composed of offenders charged with different main crimes. They could not be identified in 2000–2003, but as the charges are different, they would not help to measure gender disparities conditional on crime types.

It is possible to reduce the false match rate by defining the groups more restrictively. Indeed, some crimes are explicitly labeled as in-group crimes, for instance if the group nature of the crime constitutes an aggravating circumstance (which is not always the case). Restricting the

¹⁶ At the end of the 2000s the Ministry of Justice started creating a new dataset containing detailed information on judicial responses to crimes. This dataset contains case IDs but not defendant IDs. It is partly available starting from 2010.

analysis to crimes that are explicitly labeled as in-group crimes reduces the false match rate to 1.26% but makes the sample less representative: it only captures 21.64% of the real groups. This restrictive definition of the groups is used as a robustness check (Appendix B, Table B2).

I restrict the analysis to pairs of one man and one woman.¹⁷ Over the 2000–2003 period, I find 2,382 mixed pairs representing 4,764 offenders (2,382 women and 2,382 men). It is important to note that both members of each pair are convicted of the same main crime. Groups in which offenders are charged with different crimes are excluded,¹⁸ and the gender gap is measured net of the disparities in the charging decision. In the second dataset containing case IDs, 35% of the mixed groups are charged with different crimes. Those groups are not included in the exercise presented below. However, it is interesting to note that when members of a group are charged differently, the man usually receives a more severe charge than the woman. Charges are more severe for the man in 41% of the cases, more severe for the woman in 27% of the cases and equally severe in 33% of the cases.¹⁹

Descriptive statistics of these groups are presented in Table 1, Columns 5–8. In-group offenders are around 33 years old on average and more than 80% of them are French. Crime types are different, with a large predominance of property crimes (52%), followed by violence (13%). Finally, the sentences are harsher than those for average offenders. This is consistent with the fact that committing an in-group crime frequently constitutes an aggravating circumstance.

¹⁷ Larger groups are excluded. In groups composed of three offenders, the gender ratio is necessarily imbalanced. Groups composed of more than three offenders are rare.

¹⁸ In particular, groups in which one person is convicted of “failure to assist a person in danger”, “assistance to commit a crime”, “non denunciation”, etc. are excluded. Cases in which the crimes are different (e.g., drug dealing vs. drug consumption, theft vs. fencing, procuring vs. prostitution) are also excluded.

¹⁹ In this exercise, severity is measured as the longest possible sentence for the charge indicated in the criminal code.

Within the pairs, men are on average older, less frequently French, have more prior convictions, and receive harsher sentences than their female partners. The average prison sentences are almost doubled for men (65 days versus 32), which is partly counterbalanced by shorter suspended prison terms (42 versus 50). The probation times are similar.

4.2. Main results

Mixed peer groups allow gender differences to be measured within pairs. Figure 1 documents the share of groups in which men are more, equally or less severely sentenced than women. It shows that the sentences are usually equal. Overall, 76% of the pairs receive the same prison term, 87% receive the same probation time, 71% received the same suspended prison time and 83% the same fine. This is partly because some of the duos are composed of two offenders who receive no prison (70%), no probation (81%), no suspended prison (52%), or no fine (68%).

More interesting is the fact that when the sentences diverge, the share of cases in which women are more severely sentenced is not equal to the share of cases in which men are more severely sentenced. Regarding prison time, men receive longer sentences 19% of the time. On the contrary, women receive longer sentences only 4% of the time. The opposite is true regarding suspended prison sentences: women receive longer suspended sentences in 18% of the cases versus 11% for men.

The same picture emerges from the analysis of the *type* of sentence (rather than *length* of sentence). Figure 2 presents, for each type of sentence, the proportion of duos in which neither of the offenders is sentenced to prison (resp. probation, suspended prison, or fine),

both offenders receive a prison sentence (resp. probation, suspended prison, or fine), or only the man or woman goes to prison (resp. probation, suspended prison, or fine). No one gets prison in 70% of the cases; both get it in 12% of the cases; only the man in 15% of the cases and only the woman in 23% of the cases. No clear differences are observed for probation sentence or fine. Women are frequently the only ones to get suspended prison sentences.

I further investigate the patterns observed in Figures 1 and 2, by using regressions of the form:

$$Sentence_{i,g} = \sigma_g + \alpha_1 * sex_i + \beta * X_i + \varepsilon \quad (2)$$

where $Sentence_{i,g}$ is the outcome variable (prison day, probation day...) of person i who belongs to group g ; σ_g are group fixed effects (2,383 dummies); sex_i is a dummy equal to 1 if i is a woman; and X_i is a set of control variables (i.e., age, age squared, past convictions, nationality, criminal career). In contrast to date, place and crime type – which are, by construction, identical within groups – the control variables used in equation (2) are not equal within groups. Those variables can then be identified.

The results are presented in Table 2. The first four columns present the effect of gender on average sentences for prison, probation, suspended prison, and fine. The gender gap within pairs is even larger than the one observed for the entire sample. Women receive prison sentences that are 25.6 days shorter (52% decrease compared to the average prison sentence), probation sentences that are 2.4 days shorter (8% decrease), suspended prison sentences that are 5 days longer than men receive (11% increase), and fines that are €106.6 smaller (12%

decrease). Men have a higher chance of being sentenced to prison (+8.6 percentage points), but a lower chance of getting suspended prison sentences (-6.1 percentage points).

4.3. Discussion

Offenders in the same group are judged by the same judges, in the same context, and they are sentenced for the same (main) charge. However, they could still exhibit several differences that may partly explain the observed gender gap.

First, male partners may exhibit observable characteristics associated with harsher sentences, such as committing more prior crimes. This would also be the case if males and females committed the same main crime, but males tended to commit more (or harsher) “secondary crimes” – for example if a group committed a burglary together but only the male committed the associated crime of reselling a stolen good. The regressions presented in Table 2 control for the number of charges convicted and the number of prior convictions. However, it is possible that the nature of charges or prior convictions differs. In Appendix Table 2, I measure the gender gap among pairs of offenders charged with the same number of crimes (Panel B), charged with only one crime (Panel C), and charged with only one crime and with no prior convictions in the past five years (Panel D). While the coefficients vary, they go in the same direction and represent the same proportion of the mean sentences.²⁰

The second possible difference that could explain the gender gap is that male partners may exhibit unobservable characteristics associated with harsher sentences, such as being the leaders of the criminal pairs. While those dimensions are, by definition, difficult to directly

²⁰ The gender gap in prison days represents around 50% of the mean sentences. The gender gap in the probability of receiving some prison time represents around 40% of the mean.

address in the current setting, it is possible to measure the gender gap when *women* present observable characteristics associated with harsher sentences. Once again, I use the number of prior convictions as well as the number of charges convicted. The underlying assumption is that when women are charged with more crimes or have more prior convictions, they are less likely to be the follower of the group. Within pairs of males, those two characteristics are clearly associated with harsher sentences. Indeed, within pairs of males, if one offender is convicted of more charges, he receives more prison time in 30% of the cases, while the opposite is true in only 11% of cases (Appendix B, Figure B1). Within the same pairs, if one offender had more prior convictions, he received a longer prison sentence 29.9% of the time and a shorter prison sentence only 7.5% of the time (see Appendix B, Figure B2).

Figure 3a presents the proportion of women that receive higher/equal/shorter sentences within the 646 pairs in which women are convicted of more charges than men.²¹ Men still more frequently receive longer prison sentences than women – 25% of the time vs. 10% of the time. The gender gap decreases – compared to the results observed in Figure 1 – but men receive harsher sentences than women 2.5 times more frequently than the opposite. Yet women more frequently receive longer *suspended* prison sentences. When the male member of the pair is charged with more crimes than the woman, the pattern observed in Figure 1 is accentuated. Men get longer prison sentences 13 times more frequently than women do (Figure 3b).

Within the 971 pairs in which women have more prior convictions than their male partner,²² Figure 4a presents the proportion in which women receive higher/equal/shorter sentences. Women receive longer prison sentences only slightly more frequently than vice versa (16.5%

²¹ Descriptive statistics of those groups are presented in Appendix B (Table B1, Columns 1 and 2).

²² Descriptive statistics of those groups are presented in Appendix B (Table B1, Columns 3 and 4).

vs. 14.1%). At the same time, if the man has more prior convictions, he receives a longer prison sentence 25 times more frequently than the vice versa (Figure 4b).

Table 3 presents the results of the regressions on the two main subgroups: (1) the woman is charged with more crimes than the man and (2) the woman has more prior convictions than the man. Men still receive longer prison sentences if their female partner was convicted of more charges. Within pairs in which the female partner has more prior convictions, gender is not significant.

While offenders who are convicted of more charges or have more prior convictions than their criminal partner are generally more severely punished than their co-offender, this is not the case for mixed pairs when the woman has those characteristics. Men could still present some unobserved characteristics that induced higher sentences like leadership or aggressiveness (or fail to present some characteristics related to shorter sentences like having children or a job).²³ However, the fact that the gender gap does not reverse (and is sometimes even retained) when women have “worse” observable characteristics is striking, and suggests there are gender disparities in France’s criminal justice system that are not explained by case characteristics or unobserved heterogeneity.

5. Gender bias and gender of the court

²³ It is worth noting that the two dimensions used here are plausibly related to other unobserved characteristics associated with harsher sentences. Indeed, McGloin and Nguyen (2012) find that experience is related to the instigation of in-group crimes and, in the exact same context, Philippe (2018) finds that partners who have the longest criminal record or the most charges are not affected by the later incarceration of their peers, while partners with the shortest criminal record or smallest number of charges are. These results indicate that criminal career or number of charges could serve as a proxy for leadership. However, the number of arrests could also be a measure of ability (Gavrilova, 2018).

Up to this point, we have not been able to rule out the hypothesis that gender differences in sentencing are entirely due to unobserved heterogeneity, even if this is unlikely considering the high homophily rate within criminal groups (see, for example, Grund, Denseley, 2014; Young, 2011). If, for example, women more frequently have children or jobs, this could explain the gap observed in the last two sections. If the unobserved heterogeneity problem is hard to address, it is possible to see if different conditions affect the gender gap.

In this section, I focus on the gender composition of the court. This dimension is *a priori* orthogonal to the offenders' characteristics. If we observe differences in the gender gap depending on the gender composition of the court, we will have evidence of differential treatment by gender in the judicial system.

5.1. Court data

Data on the gender composition of the French criminal courts come from the magistrate directories of 2000 and 2003.²⁴ As the years 2001 and 2002 are not available, the dataset is restricted to convictions in 2000 and 2003. For those two years, I gather data on the 175 first court instances. I compute data on the gender of the presidents of the court; gender of the state prosecutor (the chief prosecutor in the court); number of judges (excluding examining magistrates and judges dealing in cases involving minors); number of female judges (*idem*); number of prosecutors; and number of female prosecutors.

While women represented 54% of French judges in 2000 and 50% in 2003, they were underrepresented among prosecutors (34% in 2000, 40% in 2003). This relative gender

²⁴ Directories are no longer published after 2003.

equality in terms of access to the judicial profession masks strong hierarchical differences. For both judges and prosecutors, women are far more numerous in lower-ranking positions. They comprise fewer than 20% of presiding judges (15% in 2000, 19% in 2003) and only 10% of state prosecutors.²⁵

5.2. Empirical strategy

I merge the data on criminal records and courts' gender composition to measure the effect of the gender of judges and prosecutors on the gender gap in sentencing. In this merged dataset, the gender composition of courts varies by place (95 counties) and over time (2 years).

The characteristics of a location could be correlated with both the gender gap in sentencing and the gender composition of the court. For example, this may be the case if poorer areas exhibit a larger gender gap and a higher proportion of women in the court (because it is a less prestigious place). I can partly test for this by measuring the correlation between the proportion of women in the court and the observable characteristics of the defendants. Appendix C, Table C1 shows that the gender composition of the court is correlated with several observable characteristics of the offenders – especially gender but also nationality, pre-trial detention, procedure, and investigation length. Therefore we can conclude that static variations in gender composition by place are not a good source of identification.

Variations over time within a court are, *a priori*, a better source of identification. Indeed, the gender composition of the court should change over time because of judges' rotations. Variation according to place could be partly tested by measuring the correlation between

²⁵ This pattern fits well with research in the labor economy mentioned in the introduction: women are strongly disadvantaged regarding promotions and access to high-ranking positions (Kunze Miller 2014). This situation seems to have improved slightly between 2000 and 2003.

changes in the gender composition of the court between 2000 and 2003 and observable characteristics. No clear pattern emerges from this exercise (see Appendix C, Table C2), which confirms that within-court variation in the gender composition is a good source of identification.

I measure the effect of a court's gender composition on its gender gap in sentencing using the following equation:

$$\begin{aligned}
 Outcome_{i,p,t} = & \alpha_0 + \alpha_1 * \% women_{t,p} + \alpha_2 * sex_i * \% women_{t,p} \\
 & + \sum_{p=1}^{175} (\gamma_p * place_p + \delta_p * place_p * sex_i) + \beta * X_{i,t,p} + \varepsilon
 \end{aligned}
 \tag{3}$$

where $Outcome_{i,p,t}$ is the outcome of interest (sentence, procedural variables) of person i convicted at time t in place p ; sex_i is a dummy equal to 1 if i is a woman; $\% women_{t,p}$ is the proportion of women among judges or prosecutors at time t in place p ; $place_p$ is a dummy equal to 1 if the trial occurred in place p ; and $X_{i,t,p}$ is a set of control variables. Standard errors are clustered at the court level.

α_1 measures the effect of judges' or prosecutors' gender on average sentences, and α_2 is the parameter of interest, measuring the effect of judges' or prosecutors' gender on the gender gap. γ_p and δ_p capture all the gender variations between places. It is a list of $2*175$ (two genders and 175 courts) fixed effects for being a man in jurisdiction 1, a woman in jurisdiction 1, a man in jurisdiction 2, a woman in jurisdiction 2 and so on. This approach absorbs all of the variations between men and women across places. The remaining variations in $\% women$ come from changes over time due to judges' and prosecutors' rotations.

The effect of a court's gender composition could be twofold. First, women could judge men and women differently and affect the gender gap by changing the average sentences. Second, the share of women could affect all judges' decisions by changing the way their male colleagues judge men and women (such as the effect of having daughters on judges' decisions as documented in Glyn Sen, 2015). As the database does not contain the gender of the judge for every single decision (only the gender composition of each court), those two channels could not be disentangled.

5.3. The effect of judges' gender

The effects of the number of female judges in a court are presented in Table 4. The first row of the table demonstrates that the gender of the judges does not affect the average sentences handed down in the court. The point estimates are small and non-significant. Women do not seem to be harsher "in general."

However, as presented in row 4 ("Woman * Prop women judge"), the share of female judges does affect the gender gap. When it increases, female offenders receive, on average, a longer prison term, longer probation time and shorter suspended prison time.

A one-standard-deviation increase in the share of female judges increases the prison sentences for women by 1.5 days (a 10% reduction of the gender gap) and probation by 1.7 days, and decreases suspended prison time by 1.6 days (columns 1 to 3). The gender composition of the court has no effect on fines. These results represent an overall decrease in the gender gap.

Columns 5 to 8 indicate that the results do not come from an increase in the probability of sending women to jail or putting them on probation.

Thus, the gender gap in sentencing seems to partly depend on the judges' gender. This is strong evidence that the French judicial system treats men and women differently. The null effect on fines could be interpreted as a sign that women get lower fines *not* because they are women, but for some unobserved reason (such as being poorer, on average).

It is still possible that female offenders have certain characteristics regarding work or family, and that female judges are less attentive to those characteristics than their male colleagues. Although we cannot rule out this possibility, the hypothesis of a distortion based on gender is more parsimonious. These results are similar to those obtained by Schanzenbach (2005) and Starr (2015) in the US context. Schanzenbach interprets this decrease in the gender gap as a sign of a paternalistic bias among male judges. While this is conceivable, since it is impossible to know what the "correct" sentence is, those results could also come from excessively harsh sentences given by female judges to female offenders.

The effect of judges' gender on the gender gap varies depending on offenders' characteristics (see Appendix D). Women seem to be less "tolerant" (or harsher) of violence committed by women than similar crimes committed by men. Interestingly, the effect of judges' gender is greater for young offenders. This is consistent with Schanzenbach's interpretation: if the gender gap is due to paternalistic bias, it is not surprising to find that the judges' gender has a larger effect on young offenders, among whom women could be viewed as more fragile.

5.4. The effect of prosecutors' gender

Prosecutors could also affect the gender gap. First, they could select different charges, choose different procedures – especially accelerated procedures – or ask for pre-trial detention. Second, they could directly affect sentences by asking for more or less severe sentences.

I address the effect of prosecutor's gender on the gender gap in judicial decisions using equation 3. The results are presented in Table 5. The effect of the prosecutor's gender on charges is hard to measure in the absence of case characteristics at the moment of arrest or at the beginning of the judicial process (as in Starr, 2015). The only way to approach this question is to measure how the prosecutor's gender affects the severity of the charges conditional on the type of crime. I use the highest sentence that could be chosen for the crime according to the criminal code (0 to 10 years) to proxy for the severity of the charge. I then measure the effect of the gender of the prosecutor on crime severity, conditional on crime category, split into 26 “large” categories.

The results are presented in the first column of Table 5. Based on this (imperfect) measure, women's charges do not seem to be affected by the gender of the prosecutor. The point estimate of the interaction is both non-significant and extremely low (-2 days, while maximum sentences are up to 10 years).

Table 5 presents the results of equation (4) on three other pre-trial outcomes: probability of being judged in an accelerated procedure (column 2), probability of experiencing pre-trial detention (column 3), and number of days under pre-trial detention (column 4). The prosecutor's gender does affect women's probability of being convicted after an accelerated procedure, but it does not affect pre-trial detention. A one-standard-deviation increase in the

share of female prosecutors decreases the proportion of accelerated procedures for women by roughly 0.5%.

The results on sentences are presented in the last four columns of Table 5. The gender of the prosecutor does not seem to affect the gender gap in sentencing. The point estimates are both small and non-significant. Only suspended prison sentences seem to be slightly affected: the length of suspended sentences increases for women when there are more female prosecutors.

All in all, the gender of the prosecutor does not seem to affect the gender gap observed in the criminal justice system. This could be because the prosecutor's main discretionary power is to decide if the person should be sued or not and which charges should be filed. Those decisions are hard to study with the database used in this article – even if some evidence fails to support the hypothesis that the prosecutor's gender plays a role. However, it is an interesting finding that the gender gap in sentencing, conditional on charges, is virtually unaffected by the prosecutor's gender.

6. Conclusion

This paper examines the gender gap in France's criminal justice system using three different strategies: simple regression with extensive control variables, within-criminal-group differences, and the effect of a court's gender composition on the gender gap. The main result is that criminal justice is one of the rare social areas in which gender disparities advantage women. They tend to be sentenced to prison far less than men, and for shorter periods of time. Even when they commit a crime with a male partner, women tend to be less severely punished than their male counterparts. This gender gap is less significant when judges are

female. This last result confirms that the differences observed above are not due to unobserved heterogeneity that is not absorbed by control variables or group fixed effects. If this were the case, judges' gender should not affect the gender gap. Finally, we find that the prosecutor's gender does not affect the sentencing of men and women.

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Figure 1: Within-group sentencing distribution (length of sentence)

Note: Blue bars represent the proportion of male/female pairs in which the man receives a longer prison sentence, probation, suspended prison sentence or higher fine than his female co-offender. Green bars represent the proportion of male/female pairs in which the woman receives a longer prison sentence, probation, suspended prison sentence or higher fine than her male co-offender. Red bars represent the proportion of groups in which both offenders receive the same punishment. For example, men and women have equal prison sentences in 74% of the pairs. The man has a longer prison sentence in 22% of the cases, the woman in 4% of the cases. Black segments indicate 5% confident intervals.

Figure 2: Within-group sentencing distribution (type of sentence).

Note: Blue bars represent the proportion of male/female pairs in which no one receives prison sentence, probation, suspended prison sentence or fine. Red bars represent the proportion of male/female pairs in which both the man and the woman receive a prison sentence, probation, suspended prison sentence or fine. Green bars represent the proportion of male/female pairs in which the man receives a prison sentence, probation, suspended prison sentence or fine while the woman doesn't. Lastly, orange bars represent the proportion of male/female pairs in which the woman receives a prison sentence, probation, suspended prison sentence or fine while the man doesn't. Black segments indicate 5% confident interval.

(a)

(b)

Figure 3: sentences distribution when the woman is charged with more crimes than the man (a) or when the woman is charged with fewer crimes than the man (b).

Note: Blue bars represent the proportion of male/female pairs in which the man receives a longer prison sentence, probation, suspended prison sentence or higher fine than his female co-offender. Green bars represent the proportion of male/female pairs in which the woman receives a longer prison sentence, probation, suspended prison sentence or higher fine than her male co-offender. Red bars represent the proportion of groups in which both offenders receive the same punishment. Black segments indicate 5% confident intervals.

(a)

(b)

Figure 4: sentences distribution when the woman has a more prior convictions than the man (a) or when the woman has a less prior convictions than the man (b).

Note: Blue bars represent the proportion of male/female pairs in which the man receives a longer prison sentence, probation, suspended prison sentence or higher fine than his female co-offender. Green bars represent the proportion of male/female pairs in which the woman receives a longer prison sentence, probation, suspended prison sentence or higher fine than her male co-offender. Red bars represent the proportion of groups in which both offenders receive the same punishment. Black segments indicate 5% confident intervals.

	All				Mixed duos			
	Women		Men		Women		Men	
	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Age	35.49	12.06	33.16	12.02	32.78	11.58	33.75	11.9
French	.89	.31	.86	.34	.83	.38	.8	.4
Past conviction	.16	.37	.32	.46	.17	.38	.33	.47
Crime type								
Property crimes	.36	.48	.27	.44	.52	.5	.52	.5
Road	.25	.43	.37	.48	0	.05	0	.05
Economy	.08	.27	.04	.19	.12	.33	.12	.33
Violence	.15	.36	.16	.37	.13	.34	.13	.34
Drug	.04	.19	.06	.24	.08	.27	.08	.27
Insult	.06	.24	.05	.23	.07	.26	.07	.26
Other	.05	.22	.05	.22	.07	.25	.07	.25
Could be punished by a maximum of...								
1 year	.14	.35	.13	.34	.15	.36	.15	.36
2 year	.24	.42	.33	.47	.04	.19	.04	.19
3 year	.32	.47	.22	.41	.3	.46	.3	.46
5 year	.21	.41	.19	.39	.33	.47	.33	.47
more than 5 years	.1	.3	.13	.33	.17	.38	.17	.38
Pre-trial detention	.04	.19	.07	.26	.06	.24	.09	.28
Investigation length	405.14	573.9	284.5	466.37	500.7	703.05	500.7	703.05
Accelerated procedure	.03	.18	.07	.25	.06	.24	.06	.24
Nb of charges	1.46	.94	1.54	1.01	1.53	1.05	1.57	1.09
Sentences								
Prison (probability)	.11	.31	.24	.43	.14	.35	.27	.44
Prison (day) - all	18.85	100.76	47.11	163.12	32.11	144.25	64.72	213.21
prop. crimes	22.03	83.13	72.25	169.95	22.99	91.69	50.45	136.64
road	1.38	13.08	9.39	39.39				
economy	16.84	89.82	40.32	154.33	25.67	131.08	46.94	170.23
violence	19.86	110.67	63.21	200.37	41.28	191.32	72.04	248.33
drug	112.99	308.89	141.75	364.1	113.84	313.36	225.3	482.26
insult	8.43	45.29	28.96	79.17	8.24	63.54	21.3	90.29
other	22.96	124.79	50.75	164.59	24.68	90.91	48.42	178.63
Probation (probability)	.15	.35	.18	.38	.13	.34	.15	.35
Probation (day)	25.92	88.79	29.97	90.05	27.44	97.08	31.32	104.82
Suspended prison (probability)	.38	.49	.31	.46	.42	.49	.33	.47
Suspended prison (day)	36.71	82.5	28.33	71.46	49.93	102.59	42.19	99.45
Fine (probability)	.29	.46	.33	.47	.26	.44	.27	.44
Fine (amount)	629.29	2082.34	664.97	2035.56	846.74	2782.47	962.13	3017.43
N	125,863		1,249,046		10576		10576	

Table 1. Descriptive statistics: convicted offenders 2000-2003.

Note: Columns 1-4 present the descriptive statistics for all offenders judged by adult first instance courts in France between 2000 and 2003. Column 1 and 2 are for male offender, columns 3 and 4 for female offenders. Columns 5-8 present the descriptive statistics for offenders belonging to a mixed group of criminals between 2000 and 2003. Column 5 and 6 are for male offender, columns 7 and 8 for female offenders. The longest prison sentences that could be pronounced against offenders presented in the third part of the table are defined in the criminal code.

	(1)	(2)	(3)	(3)	(5)	(6)	(7)	(3)
	Prison	Probation	Suspended prison	Fine	Prison	Probation	Suspended prison	Fine
Unit:	Day	Day	Day	Amount	Dummy	Dummy	Dummy	Dummy
Woman	-25.64*** (1.494)	-2.396*** (0.823)	5.044*** (0.841)	-106.6*** (18.29)	-0.0856*** (0.00392)	-0.00494 (0.00316)	0.0607*** (0.00452)	-0.0105*** (0.00355)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	20,970	20,970	20,970	20,970	20,970	20,970	20,970	20,970
Mean	48.84	29.63	46.46	882.4	0.208	0.141	0.377	0.264
Sd	183.5	101.4	101.5	2856	0.406	0.348	0.485	0.441

Table 2. Effect of gender on sentences within mixed groups.

Note: The outcomes are the length of the sentence, in days, in columns 1–3; the amount of the fine in column 4; dummies for receiving a prison sentence, probation or suspended prison sentence in columns 5–7; and a dummy for receiving a fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Controls include group fixed effects, nationality, age, age squared, criminal record, and number of convictions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Woman charged with more crimes than man				Woman with more prior convictions than man			
	Prison	Probation	Suspended prison	Fine	Prison	Probation	Suspended prison	Fine
Unit:	Day	Day	Day	Amount	Day	Day	Day	Amount
Woman	-36.90*** (9.210)	7.314* (4.244)	18.93*** (4.530)	-21.82 (96.29)	-0.920 (3.657)	2.455 (2.782)	-6.051*** (2.298)	-102.2* (55.58)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1,290	1,290	1,290	1,290	1,936	1,936	1,936	1,936
Mean	75.05	40.70	56.29	1079	52.23	32.51	32.60	540.1
Sd	249.6	114.6	117.9	3366	143.2	94.91	78.93	2143

Table 3. Effect of gender on sentences within different subtypes of mixed groups.

Note: The outcomes are the length of the sentence, in days, in columns 1–3; the amount of the fine in column 4; dummies for receiving a prison sentence, probation or suspended prison sentence in columns 5–7; a dummy for receiving a fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Controls include: group fixed effects, nationality, age, age squared, criminal record (only in column 1 to 3), and number of convictions (only in columns 4 to 6).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Prison	Probation	Suspended prison	Fine	Prison	Probation	Suspended prison	Fine
Unit	Day	Day	Day	Amount	Dummy	Dummy	Dummy	Dummy
% women	3.815	-2.754	0.350	-268.9*	0.0115	0.00247	0.00766	-0.0619
judge	(3.336)	(3.617)	(2.490)	(160.1)	(0.0123)	(0.0189)	(0.0269)	(0.0395)
Woman * %	8.017**	9.257***	-8.780**	-40.25	0.0130	0.0112	-0.0539**	0.00240
women judge	(4.023)	(3.243)	(3.426)	(117.8)	(0.0130)	(0.0162)	(0.0239)	(0.0230)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	698,890	698,890	698,890	698,890	698,890	698,890	698,890	698,890
Mean	44.11	29.02	30.17	634	0.222	0.171	0.326	0.329
Sd	161.1	89.11	73.67	1984	0.416	0.377	0.469	0.470

Table 4. Effect of judges' gender composition on gender gap.

*Note: The outcomes are the length of the sentence, in days, in columns 1-3; the amount of the fine in column 4; dummies for receiving at least one day of prison, probation or suspended prison in columns 5-7; a dummy for receiving a fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Prop women judge is the proportion of women among judges (between 0 and 1). Control variables are: courts*offender's gender fixed effects, year, month, crime, age, nationality, criminal record.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Longest possible sentence	Accelerated procedure	Pre-trial detention	Time in pre-trial detention	Prison	Probation	Suspended prison	Fine
Unit:	Day	Dummy	Dummy	Day	Day	Day	Day	Amount
% women prosecutor	-8.909 (14.77)	0.00250 (0.00786)	0.00331 (0.00543)	0.644 (0.688)	-0.657 (2.120)	2.147 (2.746)	-2.210 (1.729)	80.10 (95.90)
Woman * % women prosecutor	-2.398 (21.84)	-0.0196** (0.00900)	-6.24e-05 (0.00540)	-1.264 (0.922)	-2.044 (2.426)	1.979 (2.514)	4.956** (2.288)	116.2* (68.86)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	718,176	718,708	718,708	718,708	718,708	718,708	718,708	718,708
Mean	1225	0.0622	0.0676	7.336	44.11	29.02	30.17	634
Sd	837.4	0.242	0.251	50.10	161.1	89.11	73.67	1984

Table 5. Effect of prosecutors' gender composition on gender gap.

*Note: The outcomes are: the longest possible sentence, in day, as defined in the criminal code in column 1; a dummy equal to 1 if the procedure is accelerated (short time between crime and trial) in column 2; a dummy equal to one if the defendant spent some time in custody before the trial; the time, in days, in custody before the trial in column 4; the length of the sentence, in days, in columns 5-7; the amount of the fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Prop women prosecutor is the proportion of women among prosecutors (between 0 and 1). Control variables are: courts*offender's gender fixed effects, year, month, crime, age, nationality, criminal record.*

Appendix A

Table A1 presents the results of regressions of defendants' gender on different measures of sentences after controlling for observable characteristics. The control variables include:

- Crime type (1,205 dummies), one per criminal category defined by the criminal code. As mentioned in Section 2.1, criminal categories are very precisely defined. For example, codes are different for violence with one aggravating circumstance, violence without an aggravating circumstance or violence with two aggravating circumstances.
- Number of charges. As mentioned in Section 2.1, offenders could be charged with several offences committed in a single event.
- Place (175 dummies), one per court ("Tribunal de Grande Instance") in France.
- Time (4 dummies for years, 12 for months).
- Sociodemographic characteristics (age, age squared, nationality).
- Prior convictions. Two variables are used here: the number of prior convictions (variable "Nb of prior convictions") and "recidivism noticed". This second variable captures the fact that offenders who commit the *same crime* twice are considered "recidivists" according to the French criminal code. This label is explicitly recorded in the dataset as it triggers harsher sentences.
- Procedural variables: accelerated procedure (dummy), investigation length, length of pre-trial detention. Accelerated procedure is known for being associated with harsher sentences (Christin Lenoir, 2008).

Crimes that are never sanctioned by prison, probation or suspended prison sentence are dropped.

The effect of the defendants' gender on the procedural variables (listed above) is presented in the first three columns of Table A2. In Column 4, I measure the effect of gender on the

severity of the charges. This aspect is captured by the longest possible sentence that could be handed down for a crime according to the criminal code. As this maximum sentence is determined by the type of crime, the regression presented in Column 4 only includes controls for aggregated criminal categories.

The regressions presented in Table A1 could be broken down into subgroups, especially by large crime categories. This is interesting because crime controls are more or less stringent depending on the category. If, for example, crime severity could vary within the “violence inducing sick leave shorter than 8 days” category, there is far less variation within the “driving under the influence category”. The results are presented in Table A3.

Figure A1 presents, for each crime type, the gender gap in recidivism against the gender gap in the probability of receiving a prison sentence (Figure 1a) or the gender gap in the length of prison sentences (Figure 1b). The red lines represent the correlations between the variables. Those correlations are further investigated in Table A4 using a regression framework. Columns 1 and 5 present simple correlations and mimic Figures 1a and 1b, respectively. In Columns 2 and 6, controls for socio-demographic (age, nationality) and procedural characteristics (type of procedure, prior convictions, investigation length, accelerated procedure, number of convictions and time in custody) by gender are added. In Columns 3 and 7, controls for aggregate criminal categories (8 dummies for: property crimes, violent crimes, economic crimes, insults, drug-related crimes, road-related offences, illegal migration and other crimes) are added. Columns 4 and 8 add controls for aggregated criminal categories, socio-demographic and procedural characteristics.

(a)

(b)

Figure A1: Correlation between differences in recidivism rates for men and women and differences in prison time (a) or probabilities to get prison (b) for men and women. Each dot represents one crime type. The red lines indicate the fitted values. Crimes with less than 50 women convicted over 2000-2003 are excluded.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Prison	Probation	Suspended prison	Fine	Prison	Probation	Suspended prison	Fine
Unit:	Day	Day	Day	Amount	Dummy	Dummy	Dummy	Amount
Woman	-15.05*** (0.811)	1.084*** (0.331)	1.348*** (0.348)	-183.8*** (7.547)	-0.0765*** (0.00189)	0.00543*** (0.00152)	0.0346*** (0.00264)	-0.0471*** (0.00295)
French	-11.65*** (1.573)	12.52*** (1.442)	-2.685*** (0.295)	-53.01* (30.34)	-0.0390*** (0.00438)	0.0595*** (0.00652)	-0.0354*** (0.00281)	0.0205*** (0.00555)
Age	3.318*** (0.155)	1.286*** (0.0835)	-0.701*** (0.0734)	4.086** (1.660)	0.0121*** (0.000455)	0.00642*** (0.000530)	-0.00649*** (0.000567)	-0.00249*** (0.000447)
Age*age	-0.035*** (0.00153)	-0.015*** (0.000949)	0.00826*** (0.000882)	0.0124 (0.0183)	-0.00014*** (4.71e-06)	-7.5e-05*** (5.72e-06)	6.55e-05*** (6.56e-06)	3.59e-05*** (4.31e-06)
Nb prior convictions	26.20*** (0.655)	9.020*** (0.393)	-20.14*** (0.503)	-126.7*** (10.70)	0.218*** (0.00315)	0.0732*** (0.00224)	-0.210*** (0.00515)	-0.0656*** (0.00327)
Recidivism noticed	88.68*** (4.492)	5.905*** (1.515)	-20.65*** (0.848)	-16.00 (25.13)	0.247*** (0.00775)	-1.07e-05 (0.00774)	-0.161*** (0.00488)	-0.0381*** (0.00615)
Investigation length	-0.00153 (0.00164)	0.0145*** (0.000978)	0.0306*** (0.00103)	0.331*** (0.0316)	-1.83e-05*** (4.04e-06)	-2.00e-06 (2.23e-06)	4.97e-05*** (3.44e-06)	-3.89e-06 (4.01e-06)
Accelerated procedure	36.26*** (4.951)	8.488*** (1.901)	-5.349*** (0.818)	-68.41 (43.85)	0.301*** (0.0218)	0.0513*** (0.00875)	-0.0824*** (0.00904)	-0.0952*** (0.0167)
Length pre- trial detention	1.610*** (0.0829)	0.103*** (0.0142)	-0.0604*** (0.00624)	-0.107 (0.236)	0.00154*** (6.90e-05)	-3.01e-05 (2.05e-05)	0.000529*** (2.51e-05)	0.000357*** (2.60e-05)
Nb charges	20.70*** (0.946)	13.32*** (0.652)	6.612*** (0.233)	108.9*** (6.581)	0.0647*** (0.00162)	0.0480*** (0.00250)	0.00741*** (0.00168)	0.0424*** (0.00344)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1,369,391	1,369,391	1,369,391	1,369,391	1,369,391	1,369,391	1,369,391	1,369,391
Mean	44.69	29.72	29.21	651.4	0.226	0.175	0.315	0.330
Sd	158.9	90.10	72.70	2014	0.418	0.380	0.465	0.470

Table A1. Effect of gender on sentences, controlling for an extensive number of variables.

Note: The outcomes are the length of the sentence, in days, in columns 1-3; the amount of the fine in column 4; dummies for receiving a prison sentence, probation or suspended prison sentence in column 5-7; a dummy for receiving a fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Past conviction is a dummy equal to 1 if the defendant has been convicted in the past while recidivism noticed is a dummy equal to 1 if recidivism, as an aggravating circumstance, has been noticed during the trial. Additional controls include: crime (1395 dummies), place (175 dummies), time (4 dummies for years, 12 for months), type of procedure.).

	(1)	(2)	(3)	(4)
	Accelerated procedure	Investigation length	Time in pre- trial detention	Longest possible sentence
Unit:	Dummy	Day	Day	Day
Woman	-0.0122*** (0.00230)	25.03*** (2.046)	-3.028*** (0.254)	-58.69*** (3.371)
Control	All	All	All	All
Obs	1,369,391	1,369,391	1,369,391	1,368,328
Mean	0.0628	293.7	7.052	1220
Sd	0.243	477	47.86	833.8

Table A2. Effect of gender on pre-trial decisions.

Note: The outcomes are: a dummy equal to 1 if the procedure is accelerated (short delay between crime and trial) in column 1; the length of the investigations, in days, in column 2; the time, in days, in pre-trial detention in column 3; the longest possible sentence, in days, according to the criminal code in column 4. Woman is a dummy equal to 1 if the defendant is a woman. Controls include: crime (1205 dummies) or crime type in column (4), place (175 dummies), time (4 dummies for years, 12 for months), age, age squared, nationality, type of procedure, criminal career, investigation length (except in columns (1) and (2)), accelerated procedure (except in columns (1) and (2)), number of convictions and time in custody (except in column 3).

	(1) Property crime	(2) Road	(3) Violence	(4) Drug	(5) Under 30	(6) Above 30
Panel A: effect on prison (days)						
Woman	-22.52*** (0.978)	-3.441*** (0.156)	-15.01*** (1.305)	-54.76*** (5.976)	-13.74*** (0.877)	-15.42*** (0.914)
Panel B: effect on probation (days)						
Woman	2.628*** (0.557)	-0.238 (0.288)	-4.437*** (0.919)	13.82*** (3.109)	1.385*** (0.506)	0.778** (0.363)
Panel C: effect on suspended prison (days)						
Woman	2.355*** (0.513)	-2.151*** (0.209)	-1.074 (0.805)	18.15*** (3.070)	1.575*** (0.452)	1.148*** (0.390)
Panel D: effect on fine (amount)						
Woman	-140.6*** (11.11)	-124.2*** (6.849)	-82.73*** (13.35)	-253.0*** (41.73)	-109.9*** (6.427)	-224.9*** (11.32)
Obs	379,094	493,142	220,385	79,694	679,674	689,500

Table A3. Effect of gender on sentences by crime and age.

Note: panels present results for different regressions. The outcomes are the number of prison (panel A), probation (Panel B), suspended prison (Panel C) days or the amount of fine (Panel D). In the first four columns the sample is restricted to defendants convicted for the type of crime indicated in the header. Columns 5 and 6 give the results when the sample is restricted to defendant below or above 30. Woman is a dummy equal to 1 if the defendant is a woman. Controls include: crime (1205 dummies), place (175 dummies), time (4 dummies for years, 12 for months), age, age square, nationality, type of procedure, prior convictions, investigation length and time in custody (if any).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender gap in sentencing							
Unit:	Day	Day	Day	Day	Dummy	Dummy	Dummy	Dummy
Gender gap in the probability to commit a new crime	0.57 (16.0)	-3.86 (13.5)	-17.9 (16.2)	-7.22 (13.6)	0.19*** (0.029)	0.10*** (0.028)	0.16*** (0.029)	0.096*** (0.028)
Control for socio-demographic and procedural characteristics by gender	No	Yes	No	Yes	No	Yes	No	Yes
Control for aggregate criminal categories	No	No	Yes	Yes	No	No	Yes	Yes
Observations	1,024	1,024	1,023	1,023	1,024	1,024	1,023	1,023
Mean	29.5	29.5	29.5	29.5	0.092	0.092	0.092	0.092
Sd	114.9	114.9	114.9	114.9	0.21	0.21	0.21	0.21

Table A4. Correlation between gender gap in the probability to commit a new crime and gender gap in sentences.

Note: the dataset is composed of one observation per criminal category. Observations are dropped when no woman have been convicted during the period. Controls for socio-demographic and procedural characteristics by gender are averages by gender for: age, nationality, type of procedure, prior convictions, investigation length, accelerated procedure, number of convictions and time in custody. Control for aggregate criminal categories are 8 dummies for: property crimes, violent crimes, economic crimes, insults, drug related crimes, road-related offenses, illegal migrations and other crimes.

Appendix B: additional material on criminal groups

Figure B1. Sentence distribution within non-mixed male pairs when one offender has been convicted to more crime than the other.

Note: Blue bars represent the proportion of the groups for which the offender who has the smallest number of charges receives a longer prison sentence, probation, suspended prison sentence or higher fine than his partner. Green bars represent the proportion of the groups for which the offender who has the highest number of charges receives a longer prison sentence, probation, suspended prison sentence or higher fine than his partner. Red bars present the proportion of groups in which both offenders receive the same prison time sentence, probation, suspended prison sentence or the same fine. Black segments indicate 5% confident interval.

Figure B2. Sentence distribution within non-mixed male pairs when one offender has a longer criminal record than the other.

Note: Blue bars represent the proportion of the groups for which the offender who has the shortest criminal career receives a longer prison sentence, probation, suspended prison sentence or higher fine than his partner. Green bars represent the proportion of the groups for which the offender who has the longest criminal career receives a longer prison sentence, probation, suspended prison sentence or higher fine than his partner. Red bars present the proportion of groups in which both offenders receive the same prison sentence, probation, suspended prison sentence or the same fine. Black segments indicate 5% confident interval.

	Women charged with more crime convicted		Women with higher number of prior conviction	
	Women Mean	Men Mean	Women Mean	Men Mean
Age	32.79	33.27	30.79	32.1
French	.85	.81	.79	.72
Past conviction	.21	.35	1	.23
Investigation length	555.69	555.69	339.32	339.32
Pre-trial detention	.09	.1	.09	.1
Type of crime				
Property crime	.45	.45	.69	.69
Violence	.11	.11	.09	.09
Drug	.1	.1	.07	.07
Other	.34	.34	.15	.15
Nb of conviction	2.93	1.61	1.42	1.43
Sentence				
Prison (day)	53.68	96.19	51.2	52.94
Probation (day)	43.65	37.62	34.02	30.8
Suspended prison (day)	67.8	44.61	29.09	35.91
Fine (amount)	1060.25	1125.19	499.63	614.32
Prison (probability)	.22	.34	.35	.29
Probation (probability)	.2	.18	.2	.16
Suspended prison (probability)	.45	.32	.25	.34
Fine (probability)	.27	.26	.18	.21
N	646	646	971	971

Table B1. Descriptive statistics, offenders in male/female pairs in which women are more convicted (columns 1 for women, 2 for men) or women have longer criminal career (columns 3 for women and 4 for men).

	(1)	(2)	(3)	(3)	(5)	(6)	(7)	(3)
	Prison	Probation	Suspended prison	Fine	Prison	Probation	Suspended prison	Fine
Unit:	Day	Day	Day	Amount	Dummy	Dummy	Dummy	Dummy
Panel A: restricted definition of peers (4,676 observations)								
Woman	-38.67*** (4.265)	-3.217* (1.823)	10.69*** (1.993)	-74.16*** (26.07)	-0.0962*** (0.00828)	-0.00819 (0.00710)	0.0776*** (0.00937)	-0.00627 (0.00610)
Mean sample	79.29	28.63	47.34	455.2	0.262	0.136	0.426	0.200
Panel B: same number of charge (17,698 observations)								
Woman	-20.03*** (1.421)	-1.876** (0.796)	4.405*** (0.819)	-92.92*** (17.77)	-0.0762*** (0.00404)	-0.00686** (0.00318)	0.0581*** (0.00466)	-0.00749** (0.00359)
Mean sample	43.62	27.46	44.71	868.5	0.191	0.132	0.376	0.264
Panel C: only one offense charged (13,550 observations)								
Woman	-13.67*** (1.162)	-1.705** (0.771)	3.875*** (0.757)	-85.23*** (19.64)	-0.0743*** (0.00452)	-0.00611* (0.00350)	0.0551*** (0.00533)	-0.00620 (0.00431)
Mean sample	25.95	21.24	38.67	803.9	0.162	0.114	0.370	0.276
Panel D: first offenders, only one offense charged (10,070 observations)								
Woman	-9.612*** (1.276)	-2.269*** (0.850)	2.461** (0.969)	-106.5*** (25.47)	-0.0431*** (0.00386)	-0.0139*** (0.00320)	0.0374*** (0.00573)	-0.0139*** (0.00489)
Mean sample	17.42	19.65	45.32	910.6	0.0889	0.0949	0.427	0.305

Table B2. Effect of gender on sentences within male/female pairs groups. Narrower definition of criminal groups.

Note: The outcomes are the length of the sentence, in days, in columns 1-3; the amount of the fine in column 4; dummies for receiving a prison sentence, probation or suspended prison sentence in column 5-7; a dummy for receiving a fine in column 8. Woman is a dummy equal to 1 if the defendant is a woman. Controls include: group fixed effects, nationality, age, age squared, criminal record, number of convictions. Groups are composed of offender who commit the same “in group” crime, the same date, in the same court and are judged the same day. In comparison to groups used in table 2, the constraint on the type of crime – containing “in-group” in the description” – has been added.

Appendix C

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sex=woman	Age	French	Investigation length	Accelerated procedure	Pre-trial detention (day)	Past conviction	Nb convictions
% women judge	-0.00693* (0.00359)	-0.478 (0.335)	-0.0569*** (0.0149)	54.68*** (17.48)	0.0310*** (0.00800)	3.772*** (0.872)	0.0207** (0.00994)	0.0460* (0.0238)
Year=2003	-0.000503 (0.000528)	-0.0701 (0.0493)	-0.00466** (0.00219)	-1.315 (2.573)	0.00761*** (0.00118)	0.197 (0.128)	0.000434 (0.00146)	0.0322*** (0.00350)
Obs	335	335	335	335	335	335	335	335
Mean	0.0960	33.78	0.904	274.7	0.0403	5.560	0.284	1.503
Sd	0.0145	1.343	0.0618	71.04	0.0345	3.601	0.0400	0.107

Table C1: correlation between proportion of women among judges and observable characteristics of the offenders.

*Note: The dataset is composed of two observations per court: one for 2000 and one for 2003. Prop women judge is the proportion of women among judges (between 0 and 1). Year=2003 is a dummy equal to 1 in 2003. The outcomes are court*year means of the variables mentioned in the header.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Difference between 2003 and 2000 in...							
	Sex=woman	Age	French	Investigation length	Accelerated procedure	Pre-trial detention (day)	Past convictions	Nb convictions
Diff % women judge between 2000 2003	-0.000937 (0.00504)	0.553* (0.309)	0.00644 (0.00754)	-14.66 (19.33)	0.00910 (0.00929)	-0.231 (0.944)	-0.00611 (0.0112)	-0.0349 (0.0312)
Obs	161	161	161	161	161	161	161	161
Mean	-0.000985	-0.204	-0.0131	-2.295	0.0208	0.610	-0.000155	0.0960
Sd	0.0153	0.952	0.0228	55.43	0.0282	2.854	0.0327	0.0935

Table C2: correlation between change in the proportion of women among judges and changes in observable characteristics of the offenders.

Note: The dataset is one observation per court. The main explanatory variable is equal to the proportion of women in the court in 2003 minus the same proportion in 2000. The outcomes are the mean differences between 2000 and 20003 of the variables mentioned in the header.

Appendix D

	(1) Property crimes	(2) Road	(3) Violence	(4) Drug	(5) Under 30	(6) Above 30
Panel A: effect on prison (days)						
Prop women judge	1.814 (6.019)	0.315 (1.413)	0.573 (6.272)	48.51** (24.42)	3.685 (3.869)	4.902 (3.477)
Woman * Prop women judge	6.160 (7.721)	1.976 (2.111)	25.13** (12.69)	-10.74 (63.56)	13.28** (6.127)	1.615 (4.807)
Panel B: effect on probation (days)						
Prop women judge	-6.151 (5.532)	-1.493 (2.864)	-3.569 (6.952)	3.211 (12.54)	-2.090 (4.269)	-3.383 (3.589)
Woman * Prop women judge	10.38* (5.536)	6.713** (3.237)	23.66** (11.91)	15.55 (36.76)	6.160 (4.767)	11.95** (4.646)
Panel C: effect on suspended prison (days)						
Prop women judge	1.923 (3.096)	1.631 (2.960)	-2.321 (5.392)	-2.082 (12.27)	0.0250 (2.852)	0.506 (2.852)
Woman * Prop women judge	-17.30** (7.156)	0.241 (2.511)	-15.74* (8.912)	5.295 (39.17)	-16.49*** (5.556)	-4.107 (4.297)
Panel D: effect on fine (amount)						
Prop women judge	-259.9** (122.4)	-423.3** (184.1)	-73.25 (117.2)	84.21 (538.6)	-158.3 (130.6)	-386.1* (204.0)
Woman * Prop women judge	37.74 (85.17)	-82.07 (138.6)	223.4* (122.3)	919.6 (829.2)	-192.1** (93.43)	7.917 (165.6)
	199,474	246,372	113,725	42,011	348,854	349,844

Table D1: Effect of judges' gender composition on gender gap depending on crime type or age.

*Note: panels present results for different regressions. The outcomes are the number of prison (panel A), probation (Panel B), suspended prison (Panel C) days or the amount of fine (Panel D). In the first four columns the sample is restricted to defendants convicted for the type of crime indicated in the header. Columns 5 and 6 give the results when the sample is restricted to defendant below or above 30. Woman is a dummy equal to 1 if the defendant is a woman. Prop women judge is the proportion of women among judges (between 0 and 1). Controls are for courts*offender's gender fixed effects, year, month, crime, age, nationality, criminal record.*