The civilizing process in London's Old Bailey

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The jury trial is a critical point where the state and its citizens come together to define the limits of acceptable behavior. Here we present a large-scale quantitative analysis of trial transcripts from the Old Bailey that reveal a major transition in the nature of this defining moment. By coarse-graining the spoken word testimony into synonym sets and dividing the trials based on indictment, we demonstrate the emergence of semantically distinct violent and nonviolent trial genres. We show that although in the late 18th century the semantic content of trials for violent offenses is functionally indistinguishable from that for nonviolent ones, a long-term, secular trend drives the system toward increasingly clear distinctions between violent and nonviolent acts. We separate this process into the shifting patterns that drive it, determine the relative effects of bureaucratic change and broader cultural shifts, and identify the synonym sets most responsible for the eventual genre distinguishability. This work provides a new window onto the cultural and institutional changes that accompany the monopolization of violence by the state, described in qualitative historical analysis as the civilizing process.

cultural evolution | group cognition | social systems | bureaucracy | information theory

Over the course of the 19th century two developments helped to shape the modern world. First, the Western nation–state took on a newly bureaucratic form, including a newly regulated system of law and justice (1–3). And, second, the levels of violence in Western societies plummeted to a unique, all-time low. (For an overview of the statistical evidence for the long-term decline in violence, see ref. 4. Most recently, this literature and argument forms the basis for ref. 5.) Throughout Western Europe, murder became a rarity, whereas the judicial systems of both Europe and North America took on a new professionalism marked by comprehensive record keeping. Scholars using traditional historical methodologies have described this decline in violence as the central component of what is called the "civilizing process." (This is building on ref. 6. For the specifically British experience, see refs. 7–10.)

Part of a formal theory of cultural development designed to explain the emergence of the modern Western state, this civilizing process is taken to include a wide variety of forms of interpersonal relationships ranging from the rise of the concept of politeness to the relationships between classes. The core claim of the theory is that the state effectively monopolized the use of violence over the course of the 16th to 20th centuries, becoming an important actor in both the control of the cultures that encouraged violence, and in the direct policing and control of violence itself.

The bureaucracies that characterize this shift undertook information gathering on an unprecedented scale, designed in part to inform later decision making, and the digitization of these records makes it newly possible to study the civilizing process in a quantitative fashion. The data here come from the detailed records of the Central Criminal Court, or Old Bailey, in London (11, 12). The Old Bailey has heard trials for serious crimes in London and the surrounding counties since the 16th century, and forms one of the longest-running bureaucracies in the modern Western world.

We analyze the 112,485 trial records, encompassing more than 20 million (semantic) words of testimony recorded between 1760 and 1913, a period during which trial reports were at their most comprehensive. We focus on the lexical semantics of spoken testimony: the meaning-laden words used by speakers that can be grouped as synonyms at different thresholds of similarity. Our methods allow us to study the explicitly named semantic structures of these texts over more than 2 orders of magnitude in resolution, from the word-stem level (2.6×10^4 categories) to a synonym set level, with 1,040 categories, to a highly coarse-grained representation with only 116 categories.

We report two major findings. Our first finding is the emergence, by the beginning of the 19th century, of an increasingly clear distinction, within the record of spoken language, between trials associated with violent and nonviolent indictments. The result amounts to the creation of a new bureaucratic genre (13, 14) concerned with the management of violence, and its emergence is followed by a long-term, secular trend over the next 100 y that reinforces the genre through increasing distinctiveness of trial types over time. The increasingly distinctive form of statements associated with the management of violent crime provides strong quantitative evidence for the emergence of new social norms and cultural controls on behavior as context for the decline of violence over the course of the 19th century.

Our methods allow us to identify the particular categories most responsible for the distinction, and to determine their changing influence over time. Based on this analysis, our second finding concerns the large-scale structure of the genre's creation. Rather than the amplification of a particular initial pattern, we find significant change in the nature of the distinctions drawn. The civilizing process amounts not only to a strengthening of prior norms, but also to their elaboration and change over decade- and century-long timescales. Inspection of these most salient categories allows us to associate this process with both bureaucratic innovation associated with the civilizing process and

Significance

One of the characteristics of the modern era is the emergence of new bureaucratic and social mechanisms for the management and control of violence. Our analysis of 150 y of spoken word testimony in the English criminal justice system provides new insight into this critical process. We show how, beginning around the 1800s, trials for violent and nonviolent offenses become increasingly distinct. Driven by a shifting set of underlying signals, this long-term shift in the underlying norms of the system involves both changes in bureaucratic practice and in civil society as a whole.

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changes in the culture at large, and to determine the timing and strength of factors associated with these two distinct drivers.

Methods

For the period between 1674 and 1913, trials heard at the Old Bailey were also published in more or less detail in a publication popularly known as *The Old Bailey Proceedings*. This series has since been digitized, incorporating the classification of all crime types, as the Old Bailey Online (OBO) (11). The first 86 y of the corpus have not been used as they are marked by gaps in the archive, inconsistent and frequently truncated reporting, and periods of inconsistent censorship (15–19). We start our analysis in 1760, which isolates a period during which the publication of transcribed testimony was common practice. The data become even more reliable after 1778, when the City of London required that the transcripts provide a "true, fair and perfect narrative" (ref. 17, p. 468). As well as including words spoken during the trial, as put down by a short-hand reporter, the set also includes extensive metadata, including charge, verdict, and punishment.

A separate layer of mark-up, drawn from "The Old Bailey Corpus" (OBC) (12), has been used to distinguish statements that purport to be transcriptions of spoken testimony, separating out these records from the surrounding text. An example of a trial, that of Mary Hall for Grand Larceny, with verbatim spoken testimony highlighted, is shown in *SI Appendix*. Excepting a short period of censorship focused on acquittals in the early 1790s, and a longer-term practice of censoring graphic details from cases involving sexual offenses, the tagged speech is believed to provide a verbatim record of nearly every word spoken in the courtroom (20).

We map trials to probability distributions over their lexical semantics in a bag-of-words model: In particular, we coarse-grain the words that appear in the trial into named categories defined by similarity of meaning. To do this, we rely on an explicit structure provided by the 1,040 synonym classes of the 1911 edition of *Roget's Thesaurus* (21), originally created over a 47-y period between 1805 and 1852 (22). As an example, a trial in the OBC may include the word "purse," tagged as a noun, in the spoken testimony. "Purse" is found in two synonym sets: set 800, "money" and set 802, "treasury," and the weight of this single appearance is spread over two entries. Words with similar semantics also fall into these categories (the noun "coin" is also found in set 800, for example). Coarse-graining at this level allows us to deal with a more manageable set of 1,040 categories, rather than the 2.6×10^4 possible word stems, at the cost of losing fine-grained distinctions that might exist between stealing someone's purse and stealing someone's coins.

Roget's classification scheme is a nested hierarchy, and we are able to coarse-grain at different levels. On the level just above the synonym sets there are 116 categories. Continuing our example, both sets 800 and 802 coarse-grain into the superordinate category "monetary relations," which also includes the synonym sets associated with "wealth," "poverty," "credit," and "debt" (among others). As before, we are able to measure the statistics of these coarse-grained sets with greater reliability, at the cost of losing fine-grained distinctions between (for example) the theft of a purse and the failure to pay a debt.

The utility of this hierarchy for coarse-graining relies on the fact that Roget's original classifications, and his organization of these classifications into larger groups, mirrors human performance in determining the degree of relatedness between the meanings of words (23–25). In empirical and comparative studies, Roget's matched human-level abilities on classification tasks (26), at a level comparable to other databases such as WordNet (27, 28). In addition to tracking human performance, use of the explicit semantic representation provided by Roget's provides categories fixed independently of corpus frequency. [Unsupervised methods, such as topic modeling via latent Dirichlet allocation (29), can provide a different and complementary window onto this process, including the study of both nonsemantic pattern (30) and unmarked semantic distinctions within indictment classes.]

We focus on the distinction between violent and nonviolent crimes. Using the metadata attached to each trial we divide our corpus into two classes, based on the category of indictment: violent trials (with offense categories such as "assault" or "murder") and nonviolent trials (with offense categories such as "fraud" and "theft"). Our classification for violent crimes is defined in terms of the OBO's assigned offense category and subcategory; offenses classed as "violent" include murder, assault, rape, kidnapping, and wounding, and are listed in full in *SI Appendix*, section S6.

We then compute the distinguishability of trial classes by means of the Jensen–Shannon divergence (JSD) between their feature vectors. The JSD has a particularly simple interpretation as the amount of information gained about the trial class (violent vs. nonviolent) given a single sample from the trial itself. From the Shannon axioms, it has a unique functional form, which can be written as the sum of two Kullback–Leibler (KL) divergences:

$$\mathrm{JSD}\left(\vec{p},\vec{q}\right) = \frac{1}{2}\left[\mathrm{KL}\left(\vec{p}\middle|\frac{1}{2}\left(\vec{p}+\vec{q}\right)\right) + \mathrm{KL}\left(\vec{q}\middle|\frac{1}{2}\left(\vec{p}+\vec{q}\right)\right)\right], \quad [1]$$

where $\vec{p}$ and $\vec{q}$ are the two probability distributions, associated with the two distinct classes. As an information-theoretic quantity, JSD behaves sensibly under coarse-graining (31). This means we can ask about the distinguishability of trials given the appearance of a synonym set (the fine-grained level), or given only knowledge of the superordinate category that the synonym set falls under. The latter quantity is always less than or equal to the former; if fine-grained information is particularly useful for distinguishing the trial types, then coarse-graining will reduce the JSD significantly; conversely, if subtle distinctions are unimportant, then the JSD for the coarse-grained categories will be close to the fine-grained case.

To characterize the divergence between the violent and nonviolent trials, we measure each category's individual contribution to the JSD. This allows us to identify the categories that are most responsible for the divergence. The partial KL,

$$\mathrm{KL}_i\left(\vec{p},\vec{q}\right) = p_i \log \frac{2p_i}{(p_i+q_i)} \quad [2]$$

tells us the extent to which feature i in the data are a reliable signal of the $\vec{p}$ distribution. These information-theoretic methods allow us to mathematize the central question of this paper: to what extent the ways of talking in a criminal trial differed between violent and nonviolent offenses, and how these distinctions changed over time.

Results

Genre Emergence. Fig. 1 shows the long timescale history of violent and nonviolent trial distinguishability in the OBC at the synonym set level and at the more coarse-grained category level. Immediately visible is the steady increase, starting around the end of the 18th century, in the distinguishability of violent vs. nonviolent trials. Our use of the JSD measure allows us to translate this directly into information gained by knowledge of the semantics of a single word—"friend," say, or "money"—heard during the course of a trial.

For comparison, we show the 1σ ranges for a null-class model, where the 60 possible offense categories are split into two null-class genres of size equal to the violent and nonviolent genres. The null allows us to establish that until the last decade of the 18th century, the distinction between violent and nonviolent crimes simply did not exist: It is no easier to distinguish these two trial classes than it is to distinguish an arbitrary split.

Fig. 1 thus establishes not just the development, but the very emergence at these levels of coarse-graining of two distinct genres governing violent and nonviolent offenses. This takes place around roughly 1790 for the fine-grained (synonym set) case and 1795 for the coarse-grained case.

We find that a linear-increase model at both levels of coarse-graining is strongly preferred to deflationary accounts of the Old Bailey that ascribe the increase in distinguishability to purely administrative changes. Focusing our attention on the years after 1778, when transcript data are recorded directly in shorthand and are most reliable, jurisdiction changes occur in 1834 (partial extension to the whole of England) and 1855 (less serious crimes reallocated to Magistrates courts). Although these discrete events affect both the size of the court and the relative numbers of violent and nonviolent indictments, our measures of distinguishability are insensitive to volume. As an additional check for systematics, we test our model against an alternative deflationary model where the court has three stationary epochs. This alternative model is decisively rejected in favor of the linear increase model at $p < 10^{-12}$ (*SI Appendix*, section S1 and additional checks in *SI Appendix*, section S2).

Strong evidence for the emergence and development of these distinct trial genres can also be found within the two classes of violent and nonviolent indictments. We break the violent indictment class into "violent theft," "assault," and "killing"; and the nonviolent class we can break into "theft," "deception"

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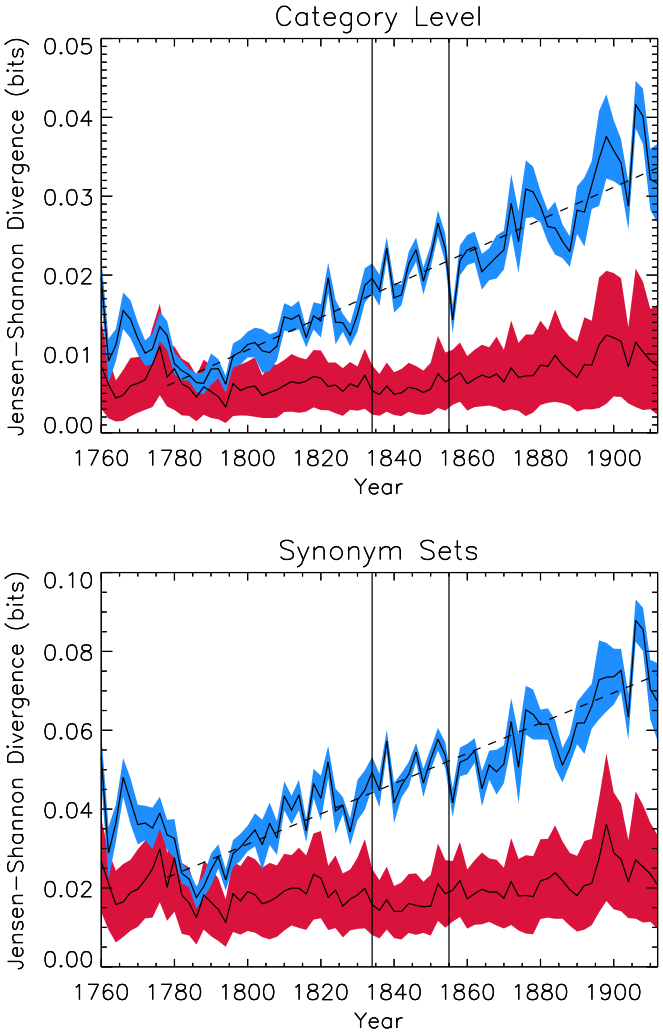

Fig. 1. The emergence of bureaucratic distinctions between violent and nonviolent offenses in the Old Bailey, 1778–1913. Shown is the JSD (Eq. **1**) at the category level (*Upper*) and the synonym set level (*Lower*). The blue line shows the JSD (and 1σ ranges) for the violent–nonviolent distinction, whereas the red line shows the ranges for a null hypothesis where the trial genres are defined by arbitrary groupings of indictment classes. Overplot as a dashed line is the maximum likelihood fit for a linear increase in the JSD beginning at 1778. Vertical lines indicate the two major administrative changes in the system in this period.

(including fraud, forgery, perjury, and bigamy), and a miscellaneous "other" category.

We can then see how trials for, say, assault and theft become increasingly distinct over time. Table 1 presents these results at the category level coarse-graining. We find significant evidence of a long-term increase in distinctiveness against nonviolent offenses for both violent theft and assault. This increasing distinctiveness across the violent–nonviolent divide contrasts with distinctions internal to the nonviolent–violent genre, which show evidence for the opposite process: As trials for violent and nonviolent offenses become more distinct, trials for (in particular) theft and deception, and theft and "other nonviolent," become less distinct over time (*SI Appendix*, section S5).

The one exception to the increasing distinctiveness of violent and nonviolent offenses occurs in the case of trials for killing. One explanation for this is an account of the civilizing process where the judicial system has already distinguished these most serious offenses—including murder, manslaughter, and infanticide—

Table 1. Increasing distinctiveness between indictment classes

Category (violent)	Category (nonviolent)	Slope, bits per decade	SD*
Violent theft	**Theft**	0.0011	+20.1
	Deception	0.0022	+14.6
	Other	0.0012	+8.5
Assault	**Theft**	6×10^{-4}	+6.2
	Deception	0.0026	+14.2
	Other	6×10^{-4}	+3.6
Killing	Theft	-3×10^{-4}	−3.1
	Deception	0.0013	+6.8
	Other	-1×10^{-4}	−0.8

*Linear model parameters and significance (SDs away from zero) for indictment class pairs at the category level coarse-graining. Pairs with significant evidence of increasing distinctiveness (>5σ) are marked in boldface.

from other forms of crime before the 1780s. We find that the distinction between trials for killing and for theft in 1780 is already larger than that between violent theft and theft in 1910.

Sources and Statistics of Distinguishability. To gain a complementary view into the cultural practices and institutions driving the distinctions established in *Genre Emergence*, we can use the partial KL, Eq. **2**, to examine the changing words and synonym sets that mark a trial as violent or nonviolent. Fig. 2 shows this graphically for the top 24 sets, which amount to a significant minority (~30%) of the total JSD found in the data. As can be read from Fig. 2*A*, for example, the synonym set "death" is a characteristic and distinguishing feature of the violent genre throughout the time period we have under investigation; similarly, "greatness" (best understood as a generic hyperbole) persists until the end of the 1890s.

As an aid to interpretation, Table 2 shows the top five words (by partial KL) for each of the 12 synonym sets whose dynamical evolution is shown in Fig. 2. Sets are listed in order of contribution to the average partial KL. In a few cases (4 of 60)—noted by an asterisk in Table 2—the ambiguity of the word stem is significant ("arms" stems to "arm," for example, and so instances are indistinguishable from reference to the body part).

Fig. 2 shows that the secular rise of distinguishability is not simply the amplification of a particular initial pattern; rather, the actual synonym sets that serve to distinguish violent from nonviolent trials are themselves changing. We can order sets by average year, weighted by partial KL. A set like "death," that remains relevant throughout, has a centroid of 1835, nearly exactly at the center of our date range. Some sets, such as "clothing," "receptacle," and "arms" are characteristic of earlier years, whereas others, such as "remedy" (associated with medical evidence) appear later.

This ability to track long timescale shifts in relevance allows us, among other things, to trace both the changing tolerance of violence and a concern with less lethal methods. The sets "impulse" (including terms such as knock, hit, and strike) and "sharpness" (including references to knives, razors, and blades) come to prominence as signatures of violent trials in the second half of the 19th century.

This particular shift can be decomposed into two underlying components: changes in the overall frequency of use and increasing predictive power independent of frequency. Comparing the first 20 y after 1778 with the last 20 y of our data, both "sharpness" and "impulse" nearly double in frequency, whereas "arms" (which includes references to pistols, revolvers, and bullets) declines slightly, by about 10%. These shifts are associated with the OBC itself, and not changing prevalence in the wider culture. In the British English Google Books corpus, the top five words associated with "sharpness" and "impulse" decline by 5%

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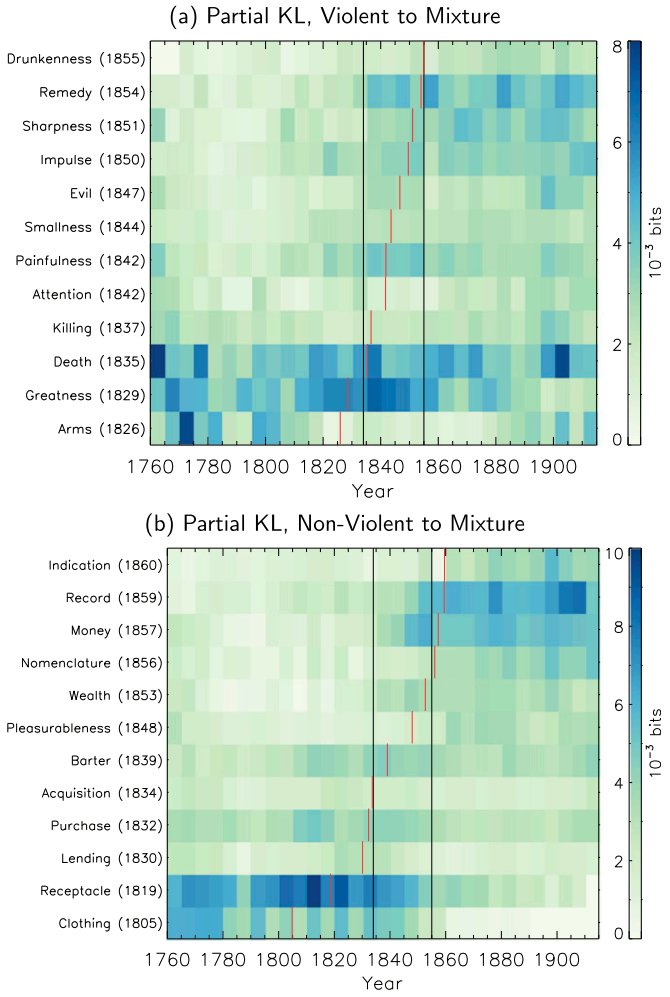

Fig. 2. Distinguishing features of violent and nonviolent trials in the OBC. Shown here is the partial KL, KL_i (Eq. **2**), for the 12 most distinctive synonym sets for violent indictments (*A*) and nonviolent indictments (*B*). Sets low on the *y* axis are associated with earlier dates. The centroid for each term is shown in parentheses and marked in red.

and 13%, respectively, between the two periods, whereas "arms" declines by 32% (32).

Independent of these overall frequency shifts, the increasing focus on less lethal methods as "violence of concern" can be quantified by means of the conditional partial KL, defined as the partial KL for category i, KL_i, divided by the probability of category i, p_i. Conditional partial KL can be interpreted as the information in bits for the trial type, given that the word seen was from category i. In the first 20 y after 1778, "impulse" provides 0.50 bits of information in favor of an indictment for violence and "sharpness" 0.42 bits. In the last 20 y of our data this rises to 0.79 bits and 0.78 bits, corresponding to a drop of roughly a factor of 3.3 and 3.9 in error rate, respectively. "Arms" sees a much smaller increase; it is already more predictive (0.68 bits) in this early period and increases to 0.77 bits, a drop in error rate of only 35%. Information in bits for a binary choice can be characterized equivalently as an error rate, corresponding to the probability of the less likely outcome (in this case, a nonviolent indictment).

Fig. 2*B* shows the synonym sets that most characterize the nonviolent genre across time. "Clothing" and "receptacle" are most prominent in marking nonviolent trials from 1760 through the mid-1840s. However, beginning in the mid-1840s and continuing through the end of our data, synonym sets such as "money," "record," and "indication" (the latter two including references to financial documents) become more characteristic of nonviolent trials. These shifts in semantic structure of nonviolent trials go hand in hand with the shifts in the kinds of nonviolent crime considered at the Old Bailey; they are roughly coterminous with the jurisdiction shift in 1855, but the relationship is not clean: strong signals in "record" and "money," for example, accompany an earlier diversification of indictment types (*SI Appendix*, section S4).

Table 2. Distinguishing features at the synonym set and lexical level for violent and nonviolent indictments

Synonym set	Most significant lexical instances
Violent	
Death	Deceased (adj., n.), death, die, dead
Greatness	Very, so, much, great, most
Remedy	Hospital, surgeon, doctor, sister, medical
Painfulness	Blow, wound, cut (v.), pain, hurt
Impulse	Knock, hit, kick, strike, push
Arms	Pistol, revolver, arms,* bullet, shot
Sharpness	Knife, razor, point, sword, blade
Killing	Blood, stab, kill, murder (n., v.)
Evil	Wound, bruise, injury, mischief, scratch
Smallness	Handful,* inch, little (adv., adj.), mouthful*
Attention	See, examine, observe, notice, attend
Drunkenness	Drunk, drink (v., n.), beer, tipsy
Nonviolent	
Receptacle	Office, bag, pocket, basket, till
Record	Book, note, sign (v.), entry, write
Purchase	Shop, buy, pay, purchase (v., n.)
Money	Money, bill, pocket, cash, coin
Barter	Shop, ask, business, transaction, custom
Clothing	Housing,* things, drawers, coat, shawl
Nomenclature	Name (n., v.), entitle, description, term
Wealth	Money, property, fortune, wealthy, afford
Pleasurableness	Good, desire, transport, satisfactory, satisfy
Indication	Letter, note, sign (v.), bill, ticket
Lending	Pawnbroker, pawn, note, loan, let
Acquisition	Find, receive, produce, take, pay

adj., adjective; adv., adverb; n., noun; v., verb.
*The ambiguity of the word stem is significant.

Discussion

The 154 y included in our analysis, from 1760 to 1913, span unprecedented political and social change, including the American and French Revolutions, the Napoleonic wars, the Industrial Revolution, Britain's transition around 1850 to majority urbanization, and the rise of her worldwide Empire. Remarkably, despite these transformative events in civil society, the treatment of violence in the legal bureaucracy is a story of gradual, long-term change, rather than one marked by abrupt transitions.

It is a process that cannot be attributed to any one or more of the small number of discrete policy changes that punctuate the history of the court. The causes associated with this phenomenon must act on a timescale much longer than any individual policy development (years), or even the career of an individual bureaucrat or political leader (years to decades). These long-term shifts are visible not only in the emergence of a binary distinction between violence and nonviolence, but also in more fine-grained distinctions such as those between theft and violent theft, or deception and physical assault.

Although we can track the (declining) per capita murder and manslaughter rate in our data, and our results confirm those of prior studies (*SI Appendix*, section S3), direct knowledge of

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historical violence—particularly when it does not rise to the level of murder—is hard to come by. One of the most important features of our work is a new ability to track, quantitatively, changing attitudes toward less serious forms of violence.

Having eliminated confounds such as jurisdictional changes, as well as changing language use in society at large and trial length and words per trial, we are able to quantify an essential correlate of the civilizing process: not a concern for the welfare of individuals per se, but rather the creation of new bureaucratic practices and distinctions associated with the control of violence. Changing attitudes become visible to our analysis in both (*i*) how the underlying events of a crime are turned into an indictment, and (*ii*) how those events are presented and discussed at trial.

The sifting of crime into different categories by the criminal justice system (theft vs. assault, for example) was the result of a complex negotiation between the victim, the police (after the formation of the Metropolitan Police in 1829), the clerk of the Grand Jury, the court, and the defendant. The classification of behavior into indictments that underlies the developing genre distinction we find here represents a consensus about the nature of the crime, reached through a complex system of negotiation and bureaucratic decision making. The gradual evolution of a public prosecution service and the emergence of a lawyer-led system both contributed to the emergence of a new adversarial trial form. For example, the Prisoners' Counsel Act in 1836 gave defendants new privileges and their counsel an increasing role in the trial process. The "lawyerization" of the court room and professionalization of the system of prosecution began in the 1690s as the state began to fund the prosecution of the most serious cases, but the introduction of expenses for prosecutors in a series of gradual steps (1752, 1778, and 1826) encouraged the increasing use of professional lawyers hired by the victim. It was only in the middle of the 19th century that the police gradually took on the role of prosecutor (ref. 33 but see also refs. 34–38).

Punishment also underwent significant change as a result of a series of legislative interventions. Before the 1820s, when confronted with a crime involving both theft and violence, prosecuting the theft could result in just as serious a punishment as prosecuting the violence. Indeed, until 1823 even minor theft cases could result in just as serious a punishment as prosecuting violence. However, by the 1840s, prosecuting for the violent features of the crime could result in more serious retribution. This changing legal landscape may also be the source of a relative increase in prosecutions for "wounding." That crimes previously treated as nonviolent are now shifted to the violent category does not, however, end up blurring the distinctions. Even as less serious violence comes under prosecution, the genre distinction becomes stronger, indicating that the civilizing process happens in both the categorization and discussion of violence.

Meanwhile, discussion of the crime was already influenced before trial by the process of preparing depositions and establishing a strategy. Testimony heard by the court was in many respects a rehearsed statement, at least in part influenced by the professions involved in the system. Coaching by lawyers in how to present a crime could easily influence the language used to the jury. And the early decades of the 19th century witnessed a remarkable growth in the role of lawyers and, as importantly, lawyers' tendency to use theatrics as a part of their professional practice (39), tracked in part by the "greatness" (generic hyperbole) synonym set.

Some of our signals are driven solely by the emergence of new topics. In the 1830s, for example, we see the emergence of "remedy" as a significant signal of the violent indictments. This synonym set contains medical terminology and appears around the time doctors became frequent witnesses in trials for both assault and murder, providing forensic testimony that includes medical terms. The practice of calling doctors as expert witnesses is localized primarily in violent trials in which the body forms a major site of evidence (40).

A combination of both categorization and discussion effects appears to explain the changing roles of firearms, blades, and "impulse" (beating), showing the development of a legal bureaucracy that comes, increasingly, to discuss non-firearm violence, and to treat that violence as a matter of direct concern, rather than in passing during a trial for a nonviolent offense.

The markers of nonviolent trials are also changing. As the court came to focus more fully on "serious" felony cases, to the exclusion of minor theft (normally prosecuted in magistrate's courts from 1855), the synonym sets involved underwent a corresponding change. Early trials for nonviolent crimes prominently include the semantics of clothing, words such as "pocket" and "basket," and the semantics of pawnbrokers, all associated with the theft and fencing of small, portable items of value stolen from one's person.

From around the midcentury, however, nonviolent trials are increasingly marked by terms in the "record" category. This includes words such as "signature," "certificate," and "ledger," reflecting the increasing importance of fraud in the mix of Old Bailey trials, and relative changes in the bureaucracy of justice itself (words such as "register" and "record" reflect evidence given by a legal officer referring to notes). In contrast to both the violent–nonviolent distinction and the internal structure of the violent indictments, these shifts internal to the nonviolent genre may be driven by the changing mix of indictment types that appeared before the court.

Conclusions

Our analysis suggests three conclusions. First, that the cultural framing of violence was a gradual process driven by evolving social attitudes and not by any particular legislative or bureaucratic change. As the work of several generations of observers, 593 working in this tradition have suggested (1–3), the civilizing process was a deep-rooted and multivalent phenomenon that accompanied the growing monopoly of violence by the state, and the decreasing acceptability of interpersonal violence as part of normal social relations. Our work here is able to track an essential correlate of this long-term process, most visibly in the separation of assault and violent theft from nonviolent crimes involving theft and deception.

The second conclusion is that a number of distinct processes combined to form the distinct genres that emerged around 1780, translating an inchoate social phenomenon into a measurable cultural process. What underlay this process was not the amplification of an originary distinction. Instead, the grounds for the distinction itself appears to be undergoing significant change. Changing strategies available to victims, decreasing tolerance of milder forms of violence, and the increasing role of words associated with the new bureaucracy itself have each been identified as significant contributors to this central genre distinction.

The third conclusion concerns the use of archives of state to identify not simply the nature and effect of intended policy changes, but also the often unintended and less controllable social and bureaucratic changes that drive the long-term evolution of culture. Our analysis uses an explicit semantic structure to coarse-grain the lexical semantics of texts, and uses information theory to quantify the resulting patterns in terms of bounds on inference. This allows us to give name and number to the *deus ex machina* that animate historical change in a fashion that allows for comparison across long timespans and between traditions.

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