Civil Liberties and Social Structure*

Selman Erol[1] and Camilo García-Jimeno[2]

[1]Tepper School of Business, Carnegie-Mellon University

[2]Federal Reserve Bank of Chicago and NBER

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Abstract

While governments use coercion and exploit the social structure to aggregate information relevant to the prosecution threats, civil liberties restrict the government's ability to exercise coercion. We present an equilibrium theory of social structure and civil liberties, where civil liberties shape citizens' socialization decisions, and the social structure (cohesiveness, segregation) shapes the civil liberties in place. Segregation and unequal treatment sustain each other. We characterize unequal treatment against minorities and majorities, and how social cohesiveness and civil liberties respond to the arrival of surveillance technologies, shocks to the likelihood of threats, and to community norms such as codes of silence.

Keywords: Civil liberties, socialization, segregation, information aggregation.

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1 Introduction

Social scientists agree that civil liberties are a key buffer protecting the rights and well-being of minorities from the whims and desires of majorities. In this view, majorities can use the government's coercive tools against minorities, and can do so arbitrarily when civil liberties are absent. Governments often have objectives of their own, however, such as the containment of regime stability threats, or the prosecution of terrorism or epidemic outbreaks. These objectives have in common that their pursuit requires aggregating information that is distributed across the citizenry, and governments can exercise coercion to collect this information. Common institutional expressions of this are the intelligence agencies and secret police services of most contemporary states. Courts of law also partially fulfill this role.

We argue that the government's ability to solve the information aggregation problem depends not just on the civil liberties in place, but crucially, also on the underlying social structure. For example, more connected or cohesive societies may allow the government to search for information more effectively, because individuals will be better informed about fellow citizens with which they are acquainted. In contrast, searching for information over a fragmented citizenry will make it hard for the government to follow clues and extract accurate information. A variety of scholars have pointed out that coercive and repressive activities by the government result in an erosion of social ties. This is no surprise, as we would expect citizens to respond to the government's exercise of coercion by reshaping their networks and socialization decisions. Discussing the French revolutionary government, DeTocqueville (1856, p. 5) argued that "Despotism... deprives citizens of... all necessity to reach a common understanding, and all opportunity to act in concert. It immures them, as it were, in private life. They were already apt to hold one another at arm's length. Despotism isolated them. Relations between them had grown chilly; despotism froze them." In a similar vein, discussing the Soviet experience Jowitt (1993, p. 304) argued that "The Leninist Legacy in Eastern Europe consists largely... of fragmented, mutually suspicious societies..." Thus, civil liberties also indirectly shape the government's ability to collect information by reshaping the underlying social structure.

In this paper we propose a model to study how concerns about state coercion, and the limits imposed on it by civil liberties, affect individual socialization choices, and consequently features of the social structure such as the density and distribution of social ties across citizens. We go beyond this arguing that understanding this problem requires a general equilibrium perspective, as the social structure in turn shapes the government's ability to aggregate information: in our model, social structure and civil liberties are jointly determined. The model rests on two premises. i) There is a potential threat, and information about it is distributed across the population. ii) While the preferences of citizens and the government regarding this threat are mis-aligned, there is no conflict between citizens. Against this background, the model has the following elements: there is a continuum of citizens, for whom socialization is valuable. When people socialize with each other, they learn information about each other. The government exploits those social ties to collect information, interrogating citizens about their acquaintances. It can then arrest individuals perceived as a threat based on the information collected. We consider two main dimensions of civil liberties, as restrictions on the coercive behavior of the government: a restriction on how many people can be questioned (e.g., a "limit on searches and seizures"), and a restriction on how strong the evidence against a citizen must be for an arrest to be possible (e.g., a "standard of proof"). Faced with the prospect of being perceived as a threat, citizens make socialization choices. Finally, society's ability to resist excessive coercion by the government can depend on the strength of its underlying 'civic values', which we take as exogenous, and more importantly, on features of the endogenous social structure.

In partial equilibrium (i.e., under fixed civil liberties), citizens limit their socialization efforts to prevent the government from easily learning about them. This decision is shaped by a key trade off: while social ties are intrinsically valuable, the government collects better information about citizens with more social ties. Weak civil liberties exacerbate this trade off by increasing the cost of becoming a subject of interest to the government. Thus, the government faces a commitment problem in this setting: at the interim stage after citizens have socialized, more intensive interrogation allows more information collection. Ex-ante, citizens' expectations of aggressive interrogation weaken their socialization incentives. We show that in the unique symmetric equilibrium, such erosion of social ties weakens the information aggregation ability of the government sufficiently that ex post it can collect strictly less information than what it could achieve if committed to a lower rate of interrogation. Strong civil liberties both protect citizens, and are a valuable commitment device for the government. Thus, in societies with weak civil liberties citizens have few social ties, and the government is unable to aggregate information effectively. In societies with strong civil liberties, friendships are abundant and the government is effective at aggregating information.[1]

We then study general equilibrium where prevailing civil liberties are jointly determined with social structure. We model the constraints on the government's information collection effort as pinned down by collective resistance to excessive coercion. Resistance in turn, is mediated by the ease with which collective action contagion spreads across citizens. This depends both on the underlying strength of society's 'civic values', and on the density of social ties across citizens. The government's commitment problem is now more involved: expectations of low levels of coercion still benefit the government by giving citizens incentives for socialization, which facilitate information collection. At the same time, the resulting cohesive social structure

[1]This is reminiscent of Acemoglu and Robinson (2017), who study a dynamic contest model between civil society and the state. When there is balance in their relative strengths, the contest is one of strategic complementarities (an 'arms race') where both civil society and the state become increasingly strong.

makes collective action more effective, making it harder for the government to interrogate widely without triggering a collective action response from citizens. At equilibrium, the density of social ties and the strength of civil liberties covary positively with the strength of civic values.

Under symmetric strategies the government interrogates citizens uniformly. The more cohesive the social structure, the harder it is to satisfy the no contagion of collective action constraint. This suggests unequal treatment, where the government interrogates different groups of citizens at different rates, as a possible way of relaxing the no contagion constraint. To explore this possibility, we extend the baseline model allowing for asymmetric strategies by introducing a payoff irrelevant dimension of observable heterogeneity across citizens (a group trait). In equilibrium, citizens' socialization decisions respond to the governments' asymmetric treatment of citizens.[2] This is because forming friendships with citizens who are targets of government interrogation becomes unattractive. We show that social segregation can arise in this case[3]: in the absence of any in-group biases in citizens' socialization preferences, and in the absence of ex-ante government favoritism towards any group, multiple equilibria with unequal treatment under the law (different standards of government coercion across groups) and segregation (different rates of socialization across groups) exist.[4] These are sustained by self-fulfilling expectations of unequal treatment. Expectations of unequal treatment are necessary for citizens to segregate, and a segregated social structure is necessary for the government to find unequal treatment profitable.[5]

[2]In Fang and Norman (2006) the government discriminates between two groups on public sector hiring. The unfavorably treated group then specializes in the private sector. In that model, there is occupational segregation but the paper does not explore social segregation, and takes as given the government's ability to discriminate.

[3]Thus, our study also relates to the literature on socialization and segregation (e.g., Akerlof (1976); Alesina and LaFerrara (2000); Bisin and Verdier (2011); Lang (1986); Schelling (1969)). Most of this literature explores the relationship between patterns of socialization and culture or individual preferences. Instead, we focus on how these relate to political institutions and the behavior of the state. Related literature exploring the relationship between socialization and social capital includes Letki (2008); Putnam (2007).

[4]In Mukand and Rodrik (2020) equal treatment under the law is also a key aspect of civil liberties. There, civil liberties arise for a very different reason: when a minority facing the threat of coercion happens to be pivotal within the political bargain between the elite and the majority, civil liberties protections arise as part of the social bargain. From a different perspective, Lagunoff (2001) proposes a theory of civil liberties where a majority refrains from imposing very restrictive legal standards towards behaviors preferred by a minority when there can be errors in the interpretation of the symbolic content of behavior that could potentially lead to punishment of members of the majority. In these and other papers, political conflict between minorities and majorities is at the heart the emergence (or not) of civil liberties. Thus, the focus is on the conditions that can allow some extent of protection of minorities. We instead take a different approach here, suggesting that civil liberties mediate the conflict between citizens and governments who have mis-aligned preferences over information aggregation, and show that endogenous social cleavages can emerge.

[5]The unequal treatment of citizens from different groups here is reminiscent of the vast literature on labor market discrimination. In a recent essay, Lang and Khan-Lang (2020) argue that while most of it has focused on either taste-based discrimination –driven by preferences–, or statistical discrimination –driven by inferences over relevant characteristic based upon group membership–, little work has attempted to model "discrimination as a system": "This idea of discrimination as a system is not easy for economists to address. Developing truly general equilibrium models is difficult, especially when the endogenous variables go beyond prices and quantities" (p. 85). Our model is one attempt to take on this challenge.

Unequal treatment equilibria in our model are shaped by two key externalities: first, when a citizen socializes more intensely, she increases the mass of friends of other citizens, making it more likely that the government receives information about them. Second, when a citizen socializes more intensely, she facilitates collective action contagion, tightening the collective action constraint faced by the government. As a result, they represent coordination failures from the citizens' point of view.[6] All citizens are hurt by unequal treatment, including those from the group experiencing better treatment.[7] The government, in contrast, can be strictly better off under unequal treatment, but only when equal treatment would entail very high levels of social cohesiveness. The equilibria with unequal treatment are robust: whenever they exist, they are the unique strict equilibria.

The model yields sharp qualitative predictions about the resulting social structures, and about the distribution of traits required to sustain unequal treatment. In our benchmark model, the largest group always experiences a higher rate of interrogation. When the minority is relatively large and incentives for socialization are relatively weak, society segregates completely. In this case, cohesiveness and segregation covary positively. When the minority is relatively small and incentives for socialization are relatively strong, there is only partial segregation, and cohesiveness and segregation covary negatively. In this case, there is more unequal treatment in the sense that the gap between the interrogation rates applied to both groups is larger. In the equilibria with unequal treatment, the extent of segregation is pinned down by the more favorably treated group: while the unfavorably treated group wants to fully socialize with the favorably treated group, the favorably treated group choses a low cross-group socialization. The nature of the collective action contagion technology in turn implies that whenever unequal treatment is attractive from the government's point of view, the government will be as coercive towards the unequally treated group as possible.

Experiences of extreme use of coercion for information aggregation purposes abound. Well documented are the medieval witch hunts in Europe (Briggs (1996))[8], the Salem witch hunt of 1692 (Godbeer (2011)), the Spanish Inquisition (Hassner (2020)) or Stalin's, Mao's, and Pinochet's purges. Another well known example is Senator McCarthy's persecution of alleged communism sympathizers in the 1950s (Klingaman (1996); Oshinsky (1983)).[9] Civil liberties,

[6] In Weingast (1997), coordination failures can also impede the emergence of the 'rule of law'. The nature of this coordination failure, however, is very different to the one here. There, the government can make an agreement with one group whose support it needs, allowing it to mis-treat the other group. There is coordination failure because both groups could be better of if they agreed on ousting the ruler.

[7] This is in contrast to the labor market discrimination literature where, either only the discriminated-against group is harmed and coordination failure exists only within this group (e.g., Coate and Loury (1993); Foster and Vohra (1992)), or where one group benefits at the expense of the other, in which case coordination failure is not present (e.g., Mailath et al. (2000); Moro and Norman (2004)).

[8] See also Johnson and Koyama (2014); Langbein (1977); Roper (2004).

[9] Also in the US, intelligence agencies were allowed to use water boarding for terrorism suspect interrogations following 9/11. Also, advanced information-verification technologies involving massive databases are now

thus, are also an important buffer between the government and civil society. They are often seen as an attempt to compromise between the conflicting objectives of prosecuting potential threats and protecting citizens from state coercion. The Bill of Rights of the US Constitution, for example, imposes restrictions on the government's ability to undertake searches and seizures and on the use of cruel punishments, and imposes minimal requirements for prosecution in the form of probable cause, Miranda rights, or varying degrees of evidentiary standards of proof.

Indeed, our model can capture a variety of settings. Threats, for example, can be actual terrorism threats where some citizens may be members of criminal organizations. Or they might represent the possibility of a subset of individuals sick with a contagious disease. They may also constitute threats to the government only, as when a group of citizens has an interest in toppling a regime, and the government is trying to crack down this opposition. They may even be 'imaginary' threats, such as a witch hunt, where the government and/or the citizens believe there exists a subset of citizens who pose a collective risk to society.

We explore a few extensions of the baseline model. First, we show that unequal treatment against the minority group can be sustained, when the collective action technology is such that unequally treating the majority would be enough to make the social resistance constraint bind. Thus, in our model, the government's group targeting is purely driven by its desire to collect as much information as possible. Second, we explore an alternative micro-foundation for the extent to which the government can extract information from its citizens. In the benchmark model, social resistance to government coercion can spread through contagion, imposing a limit on the government's interrogating ability. In some settings, however, the nature of social ties may matter for the government's ability to interrogate effectively. For example, social norms such as Banfield (1958)'s *amoral familism* among Southern Italians, or the well-known codes of silence of the mafia (see Servadio (1976)), would suggest that a government will be ineffective at extracting accurate information from people who can sustain social norms of this kind. We consider an extension of our model where community enforcement of a norm not to disclose information to the government can be sustained through common friendships between citizens.

Our results highlight that civil liberties, beyond their intrinsic value, sustain social cohesion. We are not the first suggesting a relationship between the exercise of coercion and the erosion of trust (see Badescu and Uslaner (2003); Traps (2009) in the context of Eastern European countries under communist regimes, or Nunn and Wantchekon (2011) in the context of the slave trade in tropical Africa). Our model provides a novel framework, however, that highlights how features of the informational environment are key mediators between citizens' willingness to socialize, and the state's ability to exercise coercion over them. We discuss in detail how different dimensions relevant to the informational environment, shape equilibria. The increasing use of real-time monitoring technologies (video-cameras, social media tracking, large databases,

deployed to track unlawfully present immigrants in the US (Ciancio and García-Jimeno (2020)).

etc.) by governments makes these comparative static results particularly relevant.

The remainder of the paper proceeds as follows. Section 2 introduces our benchmark model of socialization, and characterizes symmetric equilibrium, first under exogenous and then under endogenous civil liberties. Section 3 then considers asymmetric equilibria, and explores in detail the relationship between unequal treatment and social structure. Section 4 presents some extensions, and section 5 concludes. Appendices A and B contain proofs, and discuss some cross-country empirical patterns related the the model.

2 Model

We consider a static economy with a mass 1 of citizens. Citizens make socialization efforts leading to friendships. Friendships are inherently valuable, but also allow citizens to (imperfectly) learn information about each other. After friendships are formed, citizens exogenously may become members of a threat. The government tries to learn which citizens are members of this threat, by interrogating them about their acquaintances. Civil liberties limit the government's ability to interrogate citizens (e.g., search and seizure restrictions) and to subsequently arrest those who are deemed likely members of the threat (e.g., standard of proof restrictions).

2.1 Preferences and Socialization Efforts

Each citizen $i \in S$ chooses private socialization strategy $\widetilde{\rho}_i$ with support in $[\underline{\rho}, 1]$. In what follows, we will refer to ρ_i as a realization from $\widetilde{\rho}_i$. For each pair of citizens i and j, a social tie (friendship) is formed between them with probability $\rho_i \rho_j$. For simplicity, ties are drawn independently across pairs of citizens.[10] We write $e_{ij} = 1$ if a social tie is formed, and $e_{ij} = 0$ otherwise. As a result, the realized *degree* of citizen i will be:[11]

$$d_i = \int_{j \in S} e_{ij} dj. \tag{1}$$

We suppose that *after* friendships are realized, each citizen independently becomes member of a "threat" with probability χ. This prior probability is common knowledge. We denote by T the set of citizens who belong to the threat, so that $\lambda(T) = \chi$ is the measure of the threat set.[12]

[10] Golub and Livne (2010) model socialization choices in a similar vein in a network formation model where not only direct links but also higher order connections are valuable.

[11] The function $f_\rho(i) := \widetilde{\rho}_i$ does not have to be measurable. Hence integrals over these strategies may not be well defined. In what follows we will focus on Nash equilibria in symmetric strategies with bounded support. Accordingly, measurability of f_ρ will not pose any technical issues. For completeness, note that the integrals that follow are lower integrals, which are always well defined regardless of measurability. When f_ρ is measurable, as it will be in the equilibria that we consider, the lower integral and the integral coincide.

[12] The assumption that the threat is realized only after socialization decisions are made is important. Otherwise, socialization strategies will depend on membership status.

We also suppose that each citizen, regardless of threat-membership status, receives information about each of her friends, as we will describe in detail below.

Citizens value friendships and incur a cost if arrested according to the payoff function

$$U_i = \sqrt{d_i} - \kappa \mathbb{1}_{i \in A}, \tag{2}$$

where A denotes the set of arrested citizens.[13] Although in (2) κ is a utility parameter, notice that it may also be interpreted as partly reflecting the civil liberties standards of this economy. The Eight Amendment to the US Constitution, for example, directly bans excessive bail and fines, and forbids cruel and unusual punishments.

The government, on the other hand, cares about prosecuting the potential threat. Here we assume its payoff function is simply

$$V = \lambda(A). \tag{3}$$

Under (3), the government cares only about how many citizens it can arrest, and thus, does not face a cost from arresting non-threat members. The government can undertake two actions: first, it selects a subset of citizens for interrogation. We denote by N the set of citizens brought forth for interrogation. Second, once interrogations have happened, it selects a subset of citizens to arrest. Both of these decisions will be constrained by the civil liberties in place.

2.2 Institutions and Technologies

To persecute a perceived threat the government needs to aggregate information distributed across the citizenry. Information aggregation is shaped by technologies, institutions, and the underlying social structure. Exploiting the social network of friendships, the government interrogates some citizens to collect information about other citizens.[14] While the scope of interrogations can be limited by rules, the value of the information gathered will depend on the nature of the relationships between friends, and on the information aggregation technologies available to the government. This information is subsequently used to target citizens to be arrested.[15]

[13] Concavity in degree of the payoff function allows us to derive necessary and sufficient conditions for equilibrium. Under linearity we obtain sufficient conditions only, but equilibria are qualitatively the same as in our benchmark specification. For simplicity we do not allow for a cost of being interrogated, but this is without loss of generality. Citizens could also directly value the prosecution of the threat –e.g., if it is a terrorist threat or an epidemic–. Because each citizen is infinitesimal, their individual actions do not affect any aggregates, and any such additional component of their payoff will not affect their optimal behavior.

[14] For simplicity we will assume that a citizen does not provide evidence about herself, only about her friends. This could, for example, follow from an existing right not to testify against oneself. In the context of an epidemic, what we call interrogations can take the form of, for example, 'contact tracing'.

[15] In the Spanish Inquisition context, for example, (Hassner, 2020, p. 2) discusses "... how information provided under torture by one detainee led to the arrest, interrogation, or torture of others in their network".

The scope of arrests, in turn, can also be limited by rules. We incorporate civil liberties into our model as (possibly endogenous) restrictions on the government's ability to interrogate and arrest citizens.

Limits on interrogations We suppose the government faces an upper bound $\tau \in [0, 1]$ on the fraction of citizens it can take for interrogation:

$$\lambda(N) \leq \tau. \tag{4}$$

This constraint captures the idea that societies often impose limits on prosecutorial inquiries by government agents. For example, governments may be limited in their ability to arbitrarily interrogate their citizens or collect evidence through search and seizure restrictions. Such restrictions are deemed essential components of civil liberties. Accordingly, higher values of τ are associated with weaker restrictions on interrogations (worse civil liberties).

The government has access to an information aggregation technology it employs over the interrogated citizens. For simplicity, we suppose it operates as follows: each interrogated citizen $j \in N$ generates a clue about each of her friends. As a result, the government receives a measure s_i of clues about citizen i:

$$s_i = \int_{j \in N} e_{ij} dj. \tag{5}$$

The government then receives a binary signal θ_i about i's membership in the threat with precision proportional to s_i. We suppose, in particular that

$$\begin{aligned} \sigma_0(s_i) &\equiv \mathbb{P}(\theta_i = 1 | i \notin T, s_i) = a_0 - b_0 s_i \\ \sigma_1(s_i) &\equiv \mathbb{P}(\theta_i = 1 | i \in T, s_i) = a_1 + b_1 s_i, \end{aligned} \tag{6}$$

where $a_0, a_1, b_0, b_1 > 0$, $b_0 < a_0 < 1$, and $a_1 + b_1 < 1$. This information structure satisfies the monotone likelihood ratio property. More efficient information aggregation technologies can be mapped onto larger values for b_0 and b_1. The government will learn more accurately the type of a citizen who had a larger fraction of her friends interrogated. Note that under this information aggregation technology, governments facing more cohesive social structures as measured by their average degree, can aggregate information more effectively. Moreover, under this technology interrogated citizens cannot provide, on average, misleading information to the government. This may capture the idea that most governments can rely on specialized bureaucracies that can corroborate information obtained from citizens using a variety of surveillance technologies, for example. It does rule out other mechanisms through which citizens may resist the government's use of the social network to aggregate information. In section 4 we will present an extension exploring the implications of a community enforcement mechanism through which citizens may partially undermine the government's attempt to exploit the social structure of friendships.[16]

After observing the realized signals for each citizen, the government updates its beliefs using Bayes' rule. χ_i denotes the the posterior belief that $i \in T$, after observing $\theta_i = 1$:

$$\chi_i \equiv \mathbb{P}(i \in T | \theta_i = 1, s_i) = \left(1 + \frac{1-\chi}{\chi}\frac{\sigma_0(s_i)}{\sigma_1(s_i)}\right)^{-1}.$$

Limits on Arrests We suppose that the government faces a lower bound $\underline{\chi}$ 'standard of proof', so that only citizens with posterior above $\underline{\chi}$ can be arrested. We will further suppose that this civil liberty restriction is drawn from a uniform distribution

$$\underline{\chi} \sim U\left[\underline{\chi}_L, \underline{\chi}_H\right],$$

with $0 < \underline{\chi}_L < \underline{\chi}_H < 1$ so that the 'standard of proof' is subject to some ex-ante uncertainty.[17] This constraint captures the idea that societies may require minimum levels of evidence to allow the government to arrest or convict a citizen, for example through the use of probable cause requirements or varying degrees of standards of proof. Its uncertainty, in turn, can reflect the margin of leeway that judges or courts often have in interpreting a given legal standard. Higher values of $\underline{\chi}_L$ imply stronger expected civil liberties protections, while $\underline{\chi}_H < 1$ ensures there will always be some posterior evidence convincing enough to warrant an arrest. We refer to a triple $(\tau, \underline{\chi}_L, \underline{\chi}_H)$ as a *constitution*. Throughout we will maintain the following assumption:

Assumption 1.

$$\chi < \underline{\chi}_L < \left(1 + \frac{1-\chi}{\chi}\frac{a_0}{a_1}\right)^{-1} < \left(1 + \frac{1-\chi}{\chi}\frac{a_0 - b_0}{a_1 + b_1}\right)^{-1} < \underline{\chi}_H.$$

The first inequality rules out 'blind arrests': the government cannot arrest citizens based on the prior alone. Information is necessary for an arrest. Moreover, Bayesian updating implies that citizens for whom a signal $\theta_i = 0$ is realized cannot be arrested either, as the posterior over them will fall below the prior. The remaining inequalities imply that all feasible posteriors following a signal $\theta_i = 1$ are in the support of $\underline{\chi}$. Upon updating its beliefs about every citizen, the government proceeds to make arrests. Figure 1 illustrates the timeline of the game.

[16] Note that facing this technology, a government that could observe citizens' degree would have incentives to target highly connected individuals for interrogation. Here we rule out this possibility by assuming that the government does not observe citizens' degree at the time of deciding whom to interrogate.

[17] The randomness in $\underline{\chi}$ simply allows us smooth out a discontinuity in the citizens' payoff function arising when citizens can perfectly predict a threshold level of civil liberties. The discontinuity gives rise to an uninteresting equilibrium where citizens chose a level of socialization just below the discontinuity.

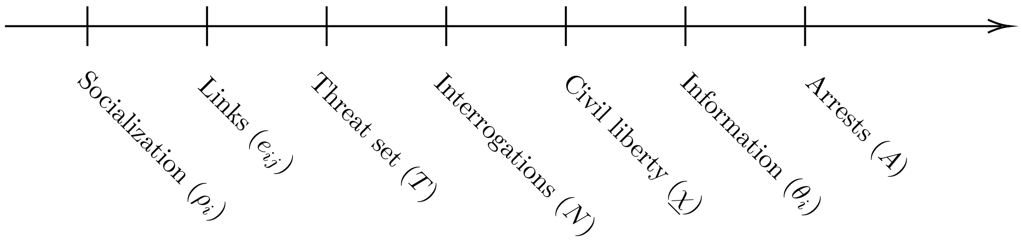


Figure 1: Timeline of Events. The figure illustrates the timing of events within the baseline game.

2.2.1 Discussion

The dimensions of civil liberties we emphasize and model here are two of the main buffers between governmental exercise of coercion and civil society. Our discussion closely relates them to specific provisions in the US constitution, which is explicitly concerned with them in the Bill of Rights, but they naturally can be given a more general interpretation as any kind of effective restrictions that state agents may face when exercising authority over the public. These are not the only dimensions of civil liberties that may matter for social cohesiveness. Equal treatment under the law is another major dimension of civil liberties. Indeed, unequal treatment was likely the prime concern of the Civil Rights movement in the US, and is also clearly addressed in the US Constitution. Later in the paper we will extend our baseline model to explore the possibility of unequal treatment and its relation to social structure.

Note also that the nature of the threat (e.g., terrorism, an epidemic, a subversive opposition, etc.) may be related to the information aggregation technology (σ_0, σ_1). For example, during medieval witch trials, a simple rumor might suffice to convince a prosecutor, and even the community, of the guilt of an alleged witch. In a terrorism context, a weak civil liberties environment that allows the use of torture during interrogations may lead to a relatively inefficient information aggregation technology: as is well known, confessions extracted through physical coercion are often unreliable. Moreover, prosecutors allowed to use torture face commitment problems so that ex-post it is hard for them not to rely on it even if ex-ante relinquishing its use is more likely to lead to valuable information collection (e.g., see Baliga and Ely (2016)).

2.3 Equilibrium under a Fixed Constitution

2.3.1 The Government's Problem

In this section we consider an environment with a fixed constitution that all players take as given, and study the equilibrium social structure. In subsection 2.4 we will then endogenize the constitution. We begin characterizing the optimal interrogation and arresting behaviors of the government. These take place after citizens have made their socialization decisions and the threat set and standard of proof have been drawn.

In our baseline model the government does not care about type 1 or type 2 errors, and wants to maximize the number of arrests. Accordingly, the government will want to arrest any citizen whose signal is $\theta_i = 1$, regardless of the signal's precision. This in turns implies that conditional on $\theta_i = 1$, the government's arresting strategy is easily characterized: an arrest happens if and only if $\chi_i > \underline{\chi}$. The interrogation decision is even simpler. Because there are no direct costs of bringing citizens for questioning, the government wants to interrogate as many citizens as possible: in equilibrium, the civil liberties constraint binds and $\lambda(N) = \tau$. Moreover, the government chooses a fraction τ to interrogate uniformly at random because it does not observe citizens' socialization choices or their realized degree.[18]

2.3.2 The Citizens' Problem

Consider now citizens' socialization decisions. Their problem is to choose socialization strategies $\widetilde{\rho}_i$, taking as given all other citizens' socialization efforts and the expected interrogation and arrest behavior of the government. Here we restrict attention to symmetric strategies. Denote the average socialization of citizen i by $p_i \equiv \mathbb{E}[\rho_i]$, where the expectation is taken with respect to citizen i's strategy. Also, denote average socialization across the citizenry by

$$p \equiv \int_{j \in S} p_j dj.$$

Using these statistics, we can express a citizen's degree as $d_i = \rho_i p$. When the government is expected to interrogate a mass t of citizens, we can similarly express the amount of information generated about a citizen as $s_i = \rho_i p t$. Our starting point for characterizing the optimal socialization effort of citizens is the following result:

Lemma 1. *When the government interrogates at rate t, the expected payoff of citizen i, $\mathbb{E}_{\widetilde{\rho}_i,\underline{\chi}}[u_i]$, is proportional to*

$$\mathbb{E}_{\widetilde{\rho}_i}\left[\sqrt{p\rho_i} - \frac{t}{2\omega} p\rho_i\right], \tag{7}$$

where

$$\omega \equiv \frac{\underline{\chi}_H - \underline{\chi}_L}{2\kappa[\chi(1-\underline{\chi}_L)b_1 + \underline{\chi}_L(1-\chi)b_0]} > 0.$$

ω is a reduced-form parameter capturing how socialization incentives are shaped by the strength of civil liberties. It depends on the threat prior, χ, on the support of the standard of proof $[\underline{\chi}_L, \underline{\chi}_H]$, on the parameters governing the informativeness of signals (b_0, b_1), and on the disutility of an arrest κ. Together with t, it mediates the trade-off faced by a citizen

[18] Because the government does not observe the network structure, even if a citizen deviated from an equilibrium socialization strategy, the government would not be able to respond to such a deviation.

when deciding how intensely to socialize. This trade-off can be seen in (7). The expression inside the expectation is strictly concave in ρ_i and has a unique optimum: holding the average socialization of others constant, the marginal gains from increased socialization are decreasing, while the marginal costs associated with a higher likelihood of being arrested are constant.[19]

Recall that $\rho_i \in [\underline{\rho}, 1]$. Throughout the rest of the paper we focus on small $\underline{\rho} > 0$, and take the limit as $\underline{\rho} \to 0$. This allows us to rule out the trivial equilibrium in which no citizen socializes because no other citizen is socializing. Rather, our interest is in equilibria where citizens' socialization choices are shaped by civil liberties. For convenience we will use $x \simeq y$ to denote $x - y = O(\underline{\rho})$ as $\underline{\rho} \to 0$, $x \succeq y$ to denote $x - y \geq O(\underline{\rho})$ as $\underline{\rho} \to 0$, and $[\![x]\!] = \max\{\underline{\rho}, \min\{1, x\}\}$.

An implication of Lemma 1 is that any symmetric equilibrium must be in pure strategies.[20] In particular, it implies that citizen i's best reply is

$$p_i \simeq \left[\!\!\left[\frac{1}{p}\left(\frac{\omega}{t}\right)^2\right]\!\!\right]. \tag{8}$$

Perhaps surprisingly, here citizens' strategies are strategic substitutes. Note also that citizen i's best reply shifts down with t not because a higher t will make her more likely to be interrogated, but rather because it will make her friends more likely to be interrogated.

2.3.3 Equilibrium

The citizens' and government's problems determine, for a given constitution, the density of friendships in society, the amount of information aggregated by the government, and the mass of arrests. We are now ready to formally define an equilibrium of this economy.

Definition 1. *An equilibrium is a collection* $\left((\widetilde{\rho}_i)_{i\in S}, N, A\right)$ *with*

- *Strategies for all citizens,* $(\widetilde{\rho}_i)_{i\in S}$*, where* $\widetilde{\rho}_i \in \Delta([\underline{\rho}, 1])$*,*
- *an interrogation strategy for the government,* $N \subset S$*,*
- *and an arrest strategy for the government,* $A : \Theta \times [0,1] \to 2^S$*, where* $\theta \in \Theta$ *denotes all the information that is generated by interrogations, and* $\underline{\chi} \in [\underline{\chi}_L, \underline{\chi}_H]$ *denotes the realized standard of proof, such that:*

1. $\widetilde{\rho}_i$ *maximizes citizen i's payoff* (7) *given* $(\widetilde{\rho}_j)_{j\in S/i}$*,* N*, and* A*.*

[19] In our benchmark model the government cannot target citizens based on their network characteristics. Although we do no explore the alternative possibility, if the government could target people with many friends, this would be an additional reason to reduce socialization efforts.

[20] Equation (7) can be expressed as $\mathbb{E}_{\widetilde{\rho}_i}[\sqrt{\rho_i}]\sqrt{p} - \frac{t}{2\omega}p_i p$. Conditional on the strategy's mean p_i, $\mathbb{E}_{\widetilde{\rho}_i}[\sqrt{\rho_i}]$ is maximized at the strategy ρ_i that puts probability $\simeq 1$ on p_i and probability $\simeq 0$ on $1 - p_i$. Then citizen i's objective is $\simeq \sqrt{p_i p} - \frac{t}{2\omega}p_i p$.

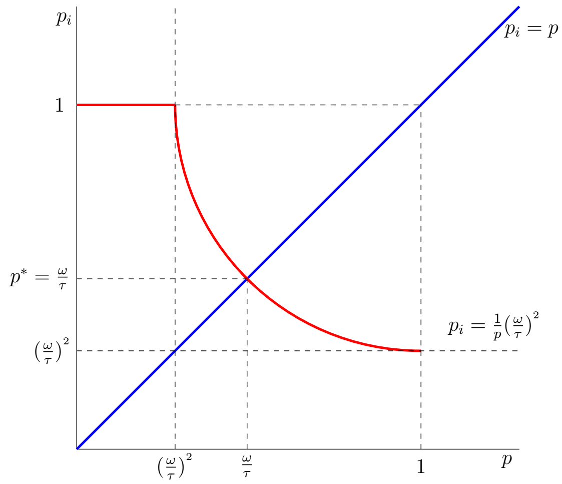


Figure 2: Symmetric Equilibrium under Fixed Civil Liberties. The red curve represents citizen i's best reply as a function of aggregate socialization. The blue curve is a 45 degree line.

2. *N maximizes the government's payoff* (3) *subject to $\lambda(N) \leq \tau$, given $(\widetilde{\rho}_i)_{i \in S}$ and A.*

3. *$A(\theta, \underline{\chi})$ maximizes the government's payoff* (3) *subject to $\chi_i \geq \underline{\chi}$, for all i, given $(\widetilde{\rho}_i)_{i \in S}$ and N.*[21]

4. *Strategies are symmetric:*

   - *All citizens play the same strategy: $\widetilde{\rho}_i \equiv \rho$ for all $i \in S$.*
   - *The government interrogates uniformly at random: each citizen in N faces the same probability of being interrogated.*

In a symmetric equilibrium, $p_i = p$ for all citizens, and the interrogation constraint binds. The best reply in (8) then implies the following result:

Proposition 1. *The unique equilibrium under a fixed constitution is in pure strategies. In this equilibrium, the average level of socialization is given by:*

$$p^* \simeq \left[\!\left[\frac{\omega}{\tau}\right]\!\right].$$

Figure 2 illustrates the unique equilibrium from proposition 1. This equilibrium implies a society with a homogeneous degree distribution –each citizen has $d_i = p^{*2}$ friends.[22] Average degree, a measure of cohesiveness, is thus also equal to p^{*2}. Equilibrium socialization depends on civil liberties through both ω and τ. It also depends on the information aggregation technology

[21] For every citizen in $A(\theta, \underline{\chi})$, the posterior belief is larger than $\underline{\chi}$ given the information θ.

[22] Notice that the restriction to symmetric strategies does not directly require a homogeneous society, because we never ruled out symmetric mixed strategies.

and the likelihood of the threat through ω. In the remainder of this paper we will restrict attention to the range of parameters $\omega < 1$. This is motivated by proposition 1: because $\tau \leq 1$, any economy where $\omega > 1$ will be fully cohesive ($p^* = 1$) regardless of the civil liberties restriction on interrogations. Our interest will be to study the economies where civil liberties are in the range where they can generate variation in social cohesiveness.

A key feature of the equilibrium from proposition 1 is that it entails a commitment problem for the government: when citizens play the symmetric pure strategy p and the government interrogates at rate t (not necessarily equilibrium strategies), the government's expected interim payoff $\mathbb{E}_{\underline{\chi}}[V]$ is proportional to $p^2 t$.[23] This is increasing in the interrogation rate t simply because a larger fraction of interrogated citizens allows the government to collect more informative signals. Because equilibrium socialization $p^* = \omega/\tau$ is a decreasing function of τ, however, ex-ante the government's payoff is ω^2/τ, which is *decreasing* in τ. Such a fragmented social structure hurts the government's ability to aggregate information effectively. In fact, the erosion of social cohesion induced by citizens' expectations of the government's behavior undermines the effectiveness of the information aggregation technology more than one to one with the interrogation rate. This is not an artifact of the linearity in the information aggregation technology. Rather, it is driven by the strategic substitutability of citizens' socialization efforts: an increase in the interrogation rate has a direct effect that reduces incentives to build social connections. It has an additional indirect effect, because the marginal benefits of socialization effort fall as other citizens socialize less intensely.

Note that the civil liberty restriction that constrains interrogations plays the role of a commitment device from the government's point of view. In its absence, the government would choose $\lambda(N) = 1$, and its equilibrium payoff would be ω^2, the minimum possible. Thus, civil liberties in our model both protect citizens from the government, and protect the government from itself.[24] This discussion highlights two key issues. First, here civil liberty constraints are exogenous. The baseline model is silent about why a government would abide by a given constitution, and just assumes it does. In general equilibrium, and given our interest in thinking about the long-run relationship between civil liberties and social structure, we expect the extent to which a society can enforce restrictions on the government's coercive abilities to be endogenous to its social structure. For example, scholars of the Soviet Union have documented how, recognizing the threat of a strong civil society, the regime focused its efforts on co-opting all forms of social organization: "Autonomous social organization was ... replaced by state-administered apparatuses that coordinated the behavior of ... trade unions, professional associations, youth groups, the mass media, the education system, and even, at the high point of totalitarian aspirations, leisure-time clubs" (Bernhard and Karakoc, 2007, p. 545-6).

[23]Proof of this can be found in the proof of Proposition 1.

[24]For $\omega < 1$, the government would like to commit to $\lambda(N) \leq \omega$, in which case its payoff would be ω.

Second, from the government's point of view, the tension between ex-ante incentives and ex-post incentives raises a new question: because effective information aggregation requires widespread interrogations and a dense social network, how could a government avoid the undermining of social cohesiveness that results when citizens expect coercive behavior, while still being able to collect information? In what follows, we will address these two questions.

2.4 Endogenous Civil Liberties

We first extend our baseline model to allow for an endogenous limit on interrogations.[25] While above we derived a relationship $p(\tau)$ for socialization as a function of civil liberties, here we provide a simple network-based micro-foundation for the emergence of an endogenous limit on the ability of the government to interrogate arbitrarily: $\tau(p)$. We do so in such a way that the mechanism in itself is not a source of multiple equilibria. Accordingly, we assume the government cannot commit to civil liberty τ, this is, there is no limit on interrogations. After socialization choices are realized, the government can interrogate as many citizens as it wants. Excessive interrogation, however, generates a response from civil society, perhaps in the form of a protest or riot, based on a simple form of contagion across citizens (e.g., Erol et al. (2020); Morris (2000)). In this way, we allow for citizens' ability to resist arbitrary levels of government coerciveness to depend on key features of its social structure. The literature on collective action, for example, points out that group features such as its size, ethnic or demographic homogeneity, social connectedness, etc., are key determinants of participation in community activities, political engagement, and public goods provision (see Alesina and LaFerrara (2000); Banerjee et al. (2008); Chay and Munshi (2015); Dippel (2014)).

We suppose interrogated citizens become 'reactive' (they are the seed of the contagion process). A citizen who observes at least share ψ of her friends to be reactive, becomes reactive herself.[26] If all of society becomes reactive, citizens engage in a form of collective action that, for simplicity, we suppose prevents the government from undertaking any arrests.[27] The possibility of this form of backlash will set a limit on the government's willingness to interrogate indiscriminately. This echoes the idea that effective coordination, in the form of collective action, allows citizens to pose credible threats to the survival of governments that violate expected limits on its behavior (Weingast (1997)). Crucially, society's cohesiveness, as measured by the density of

[25] We choose to make endogenous the limit on interrogations rather than the standard of proof as this leads to a more tractable model. This choice, however, provides us with an exogenous model parameter, namely $\underline{\chi}_L$, that allows us to ask comparative statics questions related to other characteristics of government coerciveness that one may still want to consider exogenous to the model.

[26] Recent empirical studies provide evidence of the importance of social network ties in fostering the spread of collective action (e.g., Bursztyn et al. (2019); García-Jimeno et al. (2018)).

[27] We could instead assume that collective action happens when fraction ν of society becomes reactive, with $1 > \nu > \psi$. Here we simplify the exposition by taking $\nu = 1$. In subsection 4.1 we consider an extension of the model allowing for $\nu < 1$.

friendships across citizens, mediates the contagiousness of collective action.

The timing of this modified game is as follows:[28]

1. Citizens make socialization choices.
2. The government chooses $\tau = \lambda(N)$ and makes interrogations.
3. Interrogated citizens react, and reactions spread via social ties. If reaction reaches all of society, backlash happens.
4. If there is no backlash, the government undertakes arrests.

In a symmetric equilibrium where each citizen socializes at rate p, each of them has p^2 friends. If the government interrogates fraction τ of all citizens uniformly at random, then each citizen observes $p^2\tau$ friends be interrogated. Then, if

$$p^2\tau \leq p^2\psi \tag{NRC}$$

which we refer to as the no-riot constraint (NRC), there is no contagion –none of the non-interrogated citizens becomes reactive–, and the total mass of reactive citizens is $\tau < 1$. In this case, there is no backlash and the government can execute arrests. If $p^2\tau > p^2\psi$, all citizens become reactive through contagion, and backlash takes place. Therefore, the government will always respect the no-riot constraint. The government's interim payoff is strictly increasing in the measure of arrested citizens, so it will make the (NRC) bind: $\tau(p) = \psi$.[29] Because citizens are infinitesimal, from Proposition 1 it follows that

$$p^* = \left[\!\left[\frac{\omega}{\psi}\right]\!\right] \tag{9}$$

Figure 3 illustrates the economy's unique symmetric equilibrium when socialization and civil liberties are jointly determined. Here a strong civil society is an endogenous source of commitment that improves civil liberties leading to higher equilibrium socialization. The government, in turn, is able to arrest strictly more citizens compared to when it is unconstrained by civil society.[30] Besley and Persson (2019), for example, argue that society's ability to organize depends on its social capital and democratic values. Because lower values of ψ require

[28]Accordingly, we amend the definition of equilibrium from Definition 1 as follows. Condition 2 should read instead: N maximizes the government's payoff (3) subject to $p^2\lambda(N) \leq p^2\psi$, given $(\widetilde{\rho}_i)_{i\in S}$ and A.

[29]Note that our modeling of the (NRC) leads to an inelastic equilibrium relationship between τ and p, implying a unique equilibrium. Alternative ways of micro-founding the response of civil liberties to social structure are possible, where, for example, τ is a decreasing function of p. In that case, multiple equilibria are possible (see Figure 3). Because this source of multiplicity is well understood (high interrogation-low socialization, and low interrogation-high socialization), we preferred to rule it out here.

[30]Because the measure A_τ of arrests under civil liberties τ corresponds to the ex-ante probability faced by a citizen of being arrested, $\mathbb{E}_{\underline{\chi}}\left[\mathbb{1}\{\chi_i > \underline{\chi}\}\mathbb{P}(\theta_i = 1)\right]$, it is easily verified from the proof of Lemma 1 that A_τ is decreasing in τ so that $A_1 < A_\psi$.

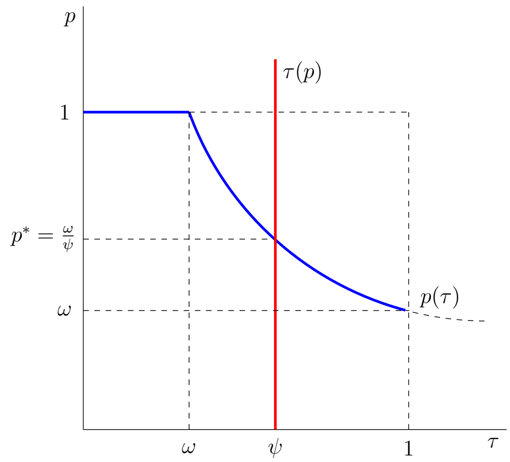


Figure 3: Symmetric Equilibrium with Endogenous Civil Liberties. The blue curve is the citizens' average socialization as a function of the interrogation rate, $p(\tau)$. The red curve is the binding no-riot constraint, $\tau(p)$.

lower levels of government coercion for contagion to spread across social ties, ψ can be interpreted as an (inverse) measure of civic engagement or the strength of civil society. Observe that our model predicts that social cohesiveness and the strength of civil liberties should covary positively with the strength of civic engagement.[31] A comparison of Scandinavian and former Soviet countries is suggestive of this pattern: Contemporary Scandinavian societies are recognized to be highly cohesive and trustful, and also highly politically engaged. In turn their governments show a remarkable capacity to collect information about their citizens. In former Soviet republics, in contrast, citizens were highly suspicious of each other (Havel (1985)). Civic engagement was also low, as effective collective action is limited by the inability of citizens to publicly express their preferences (Kuran (1995)). In turn, these governments had to invest heavily in intelligence agencies and secret police services, possibly to compensate for their ineffectiveness at information aggregation (see our empirical discussion in the online Appendix, with its associated scatter-plots in Figure 7).

Johnson and Koyama (2014) provide another example of this kind of feedback between the strength of civil liberties and social cohesiveness in the context of witch trials in 16th Century France. They argue that in regions where local courts could exercise more discretion by ignoring standard rules of evidence, more trials took place, as the trials themselves triggered fears of witchcraft among the population, leading to increased demand for further trials.

[31] In our model civic engagement as captured by ψ, is exogenous. Naturally, in practice it is likely to respond to the government's exercise of coercion and to society's cohesiveness. For example, Bautista (2016) documents how Chilean citizens who suffered human rights abuses as young adults under the Pinochet dictatorship report low political engagement thirty years later. In the Soviet context, Jowitt (1993) similarly argued that "The population at large viewed the political realm as something... to avoid" (p. 288).

3 Unequal Treatment and Social Segregation

So far we have restricted attention to symmetric equilibria, where all citizens play the same socialization strategy. In such equilibrium, the government effectively exercises equal treatment in the sense that all citizens are equally likely to be interrogated. Scholars, in fact, consider equal treatment as another important dimension of civil liberties. In many societies, *unequal treatment* is pervasive: equally situated citizens are treated differently by the government or the law. We now generalize our model allowing for asymmetric strategies (where unequal treatment may arise endogenously), suggesting a novel relationship between social structure and the prevalence of unequal treatment.

Our analysis from the previous section highlights how features of the underlying social structure, such as the density of social ties across the citizenry, play a dual role vis-a-vis the government's attempts to aggregate information. On one hand, a more cohesive society allows the government to aggregate information more effectively because each interrogated citizen can provide information about a larger number of other citizens. On the other hand, a more cohesive society is one where collective action may more easily galvanize in response to excessive coercion by the government. This environment creates a tension between the ex-ante and the ex-post incentives of the government. Whereas for a given social structure the government benefits from weak civil liberties that allow widespread information collection, before citizens have made their socialization decisions expectations of strong civil liberties lead to more intense socialization that results in more efficient information aggregation.

This analysis, however, restricted the strategy space to symmetric strategies where, as a result, there is equal treatment: the government interrogates citizens uniformly at random. Taking a look at the (NRC) suggests a possible avenue for a government facing these conflicting incentives to attempt to increase its payoff. Because societal resistance spreads through contagion via social ties, and citizens' socialization choices respond to expectations of interrogation intensity, a government may attempt relaxing the (NRC) by playing an asymmetric strategy that treats subsets of citizens differently. The expectation that the government will target a subset of the population with a high interrogation rate, for example, should decrease the willingness of citizens to socialize with that group, as it becomes costly to be friends with citizens likely to reveal information about you. The erosion of social ties can in turn undermine the effectiveness of contagion, relaxing the (NRC), allowing the government to fulfill the expectation. While some citizens remain unwilling to riot because they face a low interrogation rate and have made few friendships with highly interrogated citizens, the group of highly interrogated citizens is not large enough to trigger a riot. The government will have to trade off the erosion of social ties implied by such interrogating behavior, against the increased interrogation rate it can afford under the consequently relaxed (NRC).

In this section we show asymmetric equilibria with unequal treatment exist, and discuss their properties and implications over social structure. Suppose that each citizen in this economy possesses an immutable characteristic $g \in \{\mathcal{A}, \mathcal{B}\}$. This characteristic is irrelevant (in the sense that it is independent of threat membership, and for all citizens, the utility from forming friendships with either type is the same). The share of citizens with characteristic $\mathcal{A}$ is $\lambda_{\mathcal{A}} \equiv \lambda(\mathcal{A})$, and the share of citizens with characteristic $\mathcal{B}$ is $\lambda_{\mathcal{B}} \equiv \lambda(\mathcal{B}) = 1 - \lambda_{\mathcal{A}}$.

We will now allow for socialization strategies by citizens, and interrogation strategies by the government, that condition on type.[32] We denote by $\widetilde{\rho}_{ig}$ the socialization strategy chosen by citizen i towards citizens of type $g \in \{\mathcal{A}, \mathcal{B}\}$, and by p_{ig} the mean of ρ_{ig}. Also denote $p_{gg'}$ as the average socialization level of citizens of type g towards citizens of type g'.

3.1 The Government's Problem

We can begin by analyzing the problem of the government at the interim stage, after citizens have made their socialization choices. At this point, the government must choose possibly different interrogation rates for group $\mathcal{A}$ and group $\mathcal{B}$ citizens. Because the government gets a payoff of zero if contagion across all of society happens, we know the government will strictly prefer to avoid choosing interrogation rates that lead to full contagion.

Lemma 2. *The government's interim expected payoff after citizens have socialized at rates* $\mathbf{p} = (p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}})$, $\mathbb{E}_{\underline{\chi}}[V]$, *is proportional to*

$$\widetilde{V} = \left(\lambda_{\mathcal{A}}^2 p_{\mathcal{AA}}^2 + \lambda_{\mathcal{A}}\lambda_{\mathcal{B}} p_{\mathcal{AB}} p_{\mathcal{BA}}\right) t_{\mathcal{A}} + \left(\lambda_{\mathcal{B}}^2 p_{\mathcal{BB}}^2 + \lambda_{\mathcal{A}}\lambda_{\mathcal{B}} p_{\mathcal{AB}} p_{\mathcal{BA}}\right) t_{\mathcal{B}}$$

The government's objective is linear in both interrogation rates, with slopes that depend on the average degree of citizens of the corresponding group. Therefore, its indifference contours are straight lines. To characterize the solution to the government's problem, let's define $\Gamma_g(t_g)$ recursively as the fraction of reactive citizens in group g, when the group experiences interrogation rate t_g. This is equal to the mass of interrogated citizens from that group, t_g, if the no-contagion constraint holds for the group, and it is 1 otherwise:

$$\Gamma_g(t_g) \equiv 1 - \mathbb{1}\{NCg \text{ } holds\}(1 - t_g), \quad g \in \{\mathcal{A}, \mathcal{B}\}.$$

In turn, the no-contagion constraint for group $\mathcal{A}$ takes the form

$$\lambda_{\mathcal{A}} p_{\mathcal{AA}}^2 t_{\mathcal{A}} + \lambda_{\mathcal{B}} p_{\mathcal{AB}} p_{\mathcal{BA}} \Gamma_{\mathcal{B}}(t_{\mathcal{B}}) \leq \psi \left(\lambda_{\mathcal{A}} p_{\mathcal{AA}}^2 + \lambda_{\mathcal{B}} p_{\mathcal{AB}} p_{\mathcal{BA}}\right) \qquad (\text{NC}\mathcal{A})$$

[32] Accordingly, our definition of equilibrium from Definition 1 must be modified in the following way: All citizens within a group play the same strategy: for $g \in \{\mathcal{A}, \mathcal{B}\}$, $\widetilde{\rho}_i \equiv \widetilde{\rho}_g$ for all $i \in g$. Within a group, the government interrogates uniformly at random: any citizen in $g \in \{A, B\}$ is interrogated with probability τ_g.

The left-hand side represents the mass of reactive citizens with whom a citizen from group $\mathcal{A}$ has a social tie. This includes all her interrogated friends from group $\mathcal{A}$, $\lambda_{\mathcal{A}} p_{\mathcal{AA}}^2 t_{\mathcal{A}}$, and all her reactive friends from group $\mathcal{B}$, $\lambda_{\mathcal{B}} p_{\mathcal{AB}} p_{\mathcal{BA}} \Gamma_{\mathcal{B}}(t_{\mathcal{B}})$. This citizen will not become reactive herself if this is not larger than fraction ψ of all her friends. Analogously for citizens from group $\mathcal{B}$, there is no contagion in that group if

$$\lambda_{\mathcal{A}} p_{\mathcal{AB}} p_{\mathcal{BA}} \Gamma_{\mathcal{A}}(t_{\mathcal{A}}) + \lambda_{\mathcal{B}} p_{\mathcal{BB}}^2 t_{\mathcal{B}} \leq \psi \left(\lambda_{\mathcal{A}} p_{\mathcal{AB}} p_{\mathcal{BA}} + \lambda_{\mathcal{B}} p_{\mathcal{BB}}^2 \right) \tag{NC$\mathcal{B}$}$$

As we pointed out above, the government will never want both (NC$\mathcal{A}$) and (NC$\mathcal{B}$) to be violated simultaneously, as this would trigger a riot. Thus, the government's best reply to a given $\mathbf{p} = (p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}})$, is the solution to:

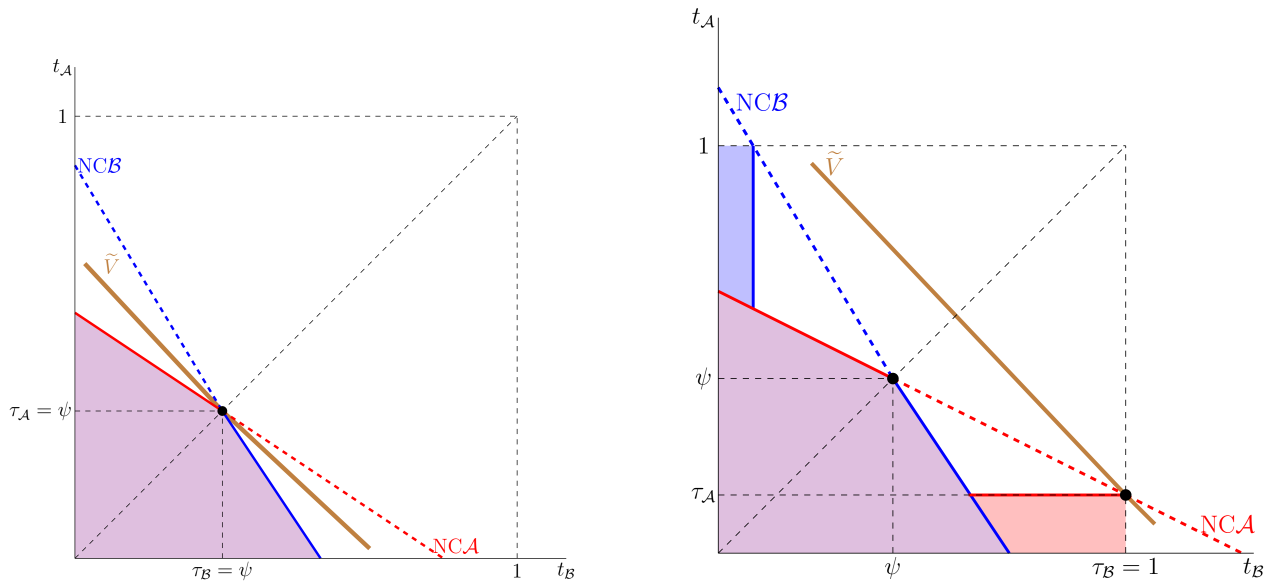
$$\boldsymbol{\tau}(\mathbf{p}|\psi, \lambda_{\mathcal{A}}) = \underset{(t_{\mathcal{A}}, t_{\mathcal{B}}) \in [0,1]^2}{\operatorname{argmax}} \widetilde{V}$$

subject to

$$\Gamma_{\mathcal{A}}(t_{\mathcal{A}}) \Gamma_{\mathcal{B}}(t_{\mathcal{B}}) < 1. \tag{NRC'}$$

This optimization problem can be represented as a linear programming problem: the objective is linear in $(t_{\mathcal{A}}, t_{\mathcal{B}})$, and the constraint set is piece-wise linear as well. Moreover, it is straightforward to show that the slope of the indifference curves is a weighted average of the slopes of the no-contagion constraints when neither group experiences contagion.

Figure 4 illustrates graphically the government's optimization problem. In the case represented in panel (a), citizens' socialization rates are such that neither of the no-contagion constraints can be violated without triggering contagion on the other group. In this case, the constraint set is convex with a kink at (ψ, ψ), making *equal treatment* the unique best response. Note that (ψ, ψ) is always a feasible choice that avoids contagion in both groups. In the case represented in panel (b), in contrast, citizens' socialization rates make it possible to violate only one of the no-contagion constraints. When the government chooses a high enough interrogation rate for group $\mathcal{B}$ citizens such that this group experiences contagion, for example, the (NC$\mathcal{A}$) becomes a horizontal line, and the constraint set is non-convex. Symmetry within a group implies that if contagion happens within the group, then the whole group becomes reactive. In such case it must be optimal for the government to interrogate all citizens of the group. It follows that the unique optimum entails a corner solution with *unequal treatment*, where $\tau_{\mathcal{B}} = 1$. In this case the (NC$\mathcal{A}$) and the (NRC') coincide. Accordingly, $\tau_{\mathcal{A}}$ is sufficiently low that (NC$\mathcal{A}$) exactly binds and a second round of contagion is prevented. Group $\mathcal{B}$ citizens are unequally treated, effectively experiencing the maximum possible interrogation rate, while



(a) Interior (equal treatment) **(b) Corner (unequal treatment)**

Figure 4: Government's Best Response: The figure illustrates the optimal choice of interrogation rates by the government for fixed socialization rates. Panel (a) represents the case in which the optimum entails no contagion on either group, and equal treatment. Panel (b) represents the case in which one group experiences contagion and unequal treatment. The brown lines labeled $\widetilde{V}$ represent the highest indifference curves that satisfy the constraint set. The red and blue curves represent the no-contagion constraints for groups $\mathcal{A}$ and $\mathcal{B}$.

group $\mathcal{A}$ citizens experience an interrogation rate equal to

$$\tau_{\mathcal{A}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p^2_{\mathcal{AA}}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}} \tag{10}$$

This is lower than the interrogation rate that would prevail under equal treatment.[33]

Collecting these results, there are only three possibilities for the government's best reply: an interior solution with equal treatment, or corner solutions with unequal treatment:[34]

1. Equal treatment: $\tau_{\mathcal{A}} = \tau_{\mathcal{B}} = \psi$;

2. Unequal treatment against group $\mathcal{A}$: $\tau_{\mathcal{A}} = 1, \tau_{\mathcal{B}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p^2_{\mathcal{BB}}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}$.

3. Unequal treatment against group $\mathcal{B}$: $\tau_{\mathcal{B}} = 1, \tau_{\mathcal{A}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p^2_{\mathcal{AA}}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}$;

As equation (10) and our previous discussion illustrate, the extent to which the government's best reply will entail unequal treatment depends on the intensity of cross-group socialization relative to within-group socialization of the favorably treated group. The lower is the intensity

[33] Note that if the expression in (10) is negative, the first round of contagion guarantees the second round of contagion, and thus a riot. Thus, this is a feasible option only if the prescribed $\tau_{\mathcal{A}}$ is positive. A symmetric logic applies to the case in which group $\mathcal{A}$ is the one experiencing unequal treatment.

[34] In the non-generic case in which contagion on only one group is feasible and the slope of the indifference curves $\widetilde{V}$ is such that an indifference curve passes through both the intersection of (NC$\mathcal{A}$) with $t_{\mathcal{B}} = 1$, and of (NC$\mathcal{B}$) with $t_{\mathcal{A}} = 1$, the government's best reply is not unique (it has two elements).

of socialization across groups, the easier it will be for the government to satisfy the (NC$\mathcal{A}$), and correspondingly, the larger the interrogation rate it will be able to impose on the more favorably treated group. Thus, a more segregated society enhances the government's ability to implement worse civil liberties. Relative group sizes are also a key determinant of the feasibility and extent of unequal treatment. Holding socialization rates constant, when the unequally treated group is smaller relative to the favorably treated group, the government can afford a higher interrogation rate for the favorably treated group. Finally, a stronger civil society (lower ψ) forces the government to chose a more favorable interrogation rate toward the favorably treated group. Note this *increases* the extent of inequality in treatment across groups.

3.2 Citizens' Socialization Decision

We can now consider the problem of a citizen from group $g \in \{\mathcal{A}, \mathcal{B}\}$, allowing for citizens from different groups to chose possibly different socialization strategies, but restricting attention to symmetric strategies within each group. In this case, the degree and the amount of information collected by the government about citizen i depend on how intensely citizens socialize within their own group, and across groups.

Lemma 3. *When the government interrogates citizens of groups $\mathcal{A}$ and $\mathcal{B}$ at rates $\tau_{\mathcal{A}}$ and $\tau_{\mathcal{B}}$, the expected payoff of citizen i, $\mathbb{E}_{\rho_{i\mathcal{A}},\rho_{i\mathcal{B}},\underline{X}}[u_i]$, is proportional to*

$$\mathbb{E}_{\rho_{i\mathcal{A}},\rho_{i\mathcal{B}}}\left[\sqrt{\sum_{h\in\{\mathcal{A},\mathcal{B}\}} \rho_{ih} p_{hg} \lambda_h} - \frac{1}{2\omega}\left(\sum_{h\in\{\mathcal{A},\mathcal{B}\}} \rho_{ih} p_{hg} \lambda_h \tau_h\right)\right] \tag{11}$$

As it was the case when we restricted attention to symmetric strategies, the expected payoff of each citizen is concave in their strategy. As a result, they all play pure strategies and $\rho_{ig} = p_{ig}$. Straightforward first order conditions from (11) with respect to these strategies yield citizens' best responses to each other. Further imposing symmetry within groups, for citizens from group $\mathcal{A}$ we have

$$p_{\mathcal{A}\mathcal{A}} = \left[\!\!\left[\frac{(\omega/\tau_{\mathcal{A}})^2 - \lambda_{\mathcal{B}} p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}}{\lambda_{\mathcal{A}} p_{\mathcal{A}\mathcal{A}}}\right]\!\!\right], \qquad p_{\mathcal{A}\mathcal{B}} = \left[\!\!\left[\frac{(\omega/\tau_{\mathcal{B}})^2 - \lambda_{\mathcal{A}} p_{\mathcal{A}\mathcal{A}}^2}{\lambda_{\mathcal{B}} p_{\mathcal{B}\mathcal{A}}}\right]\!\!\right], \tag{12}$$

and for citizens from group $\mathcal{B}$,

$$p_{\mathcal{B}\mathcal{A}} = \left[\!\!\left[\frac{(\omega/\tau_{\mathcal{A}})^2 - \lambda_{\mathcal{B}} p_{\mathcal{B}\mathcal{B}}^2}{\lambda_{\mathcal{A}} p_{\mathcal{A}\mathcal{B}}}\right]\!\!\right], \qquad p_{\mathcal{B}\mathcal{B}} = \left[\!\!\left[\frac{(\omega/\tau_{\mathcal{B}})^2 - \lambda_{\mathcal{A}} p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}}{\lambda_{\mathcal{B}} p_{\mathcal{B}\mathcal{B}}}\right]\!\!\right], \tag{13}$$

which is a system of four non-linear equations in the four socialization rates. Higher interrogation rates on one's group reduce the willingness to socialize with fellow group members, and higher interrogation rates on the other group reduce the willingness to socialize with members of the other group. We can express this system of equations more compactly as

$$\mathbf{p} = \Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho}). \tag{14}$$

Fixed points of Ψ on $[0,1]^4$ are mutually consistent in-group and out-group socialization strategies for a given vector of interrogation rates $\boldsymbol{\tau}$. These correspond to equilibria of the game with exogenous civil liberties $\boldsymbol{\tau}$.

Proposition 2. *The fixed points of $\Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$ as $\underline{\rho} \to 0$ can be characterized as follows:*

1. *For $\tau_{\mathcal{A}} \neq \tau_{\mathcal{B}}$, $\Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$ has a unique fixed point, where some of the socialization rates are interior.*

2. *For $\tau_{\mathcal{A}} = \tau_{\mathcal{B}} = \tau$,*

   - *If $\omega \geq \tau$, $\Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$ has a unique fixed point. Furthermore, it implies full socialization within and across all groups: $p_{gh} = 1$ for all $g, h \in \{\mathcal{A}, \mathcal{B}\}$.*
   - *If $\omega < \tau$, $\Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$ has a continuum of payoff-equivalent fixed points, all payoff-equivalent to the fixed point $p_{gh} = \omega/\tau$ for all $g, h \in \{\mathcal{A}, \mathcal{B}\}$.*

Proposition 2 illustrates the forces shaping citizens' socialization decisions. First, expectations about the government's behavior. Within-group ($p_{\mathcal{AA}}$ and $p_{\mathcal{BB}}$) and cross-group ($p_{\mathcal{AB}}$ and $p_{\mathcal{BA}}$) socialization decisions depend on the interrogation rates expected on the own group but also on the other group. Expectations of equal or unequal treatment are key. When citizens expect unequal treatment ($\tau_{\mathcal{A}} \neq \tau_{\mathcal{B}}$), Ψ has a unique fixed point where some of the socialization rates are interior.[35] Consider, for example, the best replies for group $\mathcal{A}$ in (12). Note that these two equations cannot hold simultaneously at interior values for $(p_{\mathcal{AA}}, p_{\mathcal{AB}})$ when $\tau_{\mathcal{A}} \neq \tau_{\mathcal{B}}$. In this case, one of the socialization rates must be at a corner ($\simeq 0$ or $= 1$). As we will see below, relative group sizes will pin down when the different corner solution socialization rates can arise. When citizens expect equal treatment ($\tau_{\mathcal{A}} = \tau_{\mathcal{B}}$), in contrast, each pair of best replies in (12) and (13) reduces to the same equation, so we have two equations in four unknowns. This explains why homogeneous socialization rates are a solution as stated in the second part of Proposition 2, as well as why in this case Ψ has a continuum of fixed points.

Second, (12) and (13) make explicit the form of strategic interactions taking place across groups. For all citizens, both within and cross-group socialization best replies depend negatively on the cross-socialization choice of citizens from the other group. This is true regardless of whether citizens expect interrogation rates to be the same across groups or not.

[35] The proof of Proposition 2 in Appendix A explicitly computes the fixed points in each case.

3.3 Equilibria

We are now ready to discuss equilibria in the game with asymmetric strategies. To characterize the equilibria of this game, without loss of generality we will assume that $\lambda_{\mathcal{A}} < 1/2$ so that group $\mathcal{A}$ is the *minority*. Just as it was the case when restricting attention to symmetric strategies across all citizens, the infinitesimal nature of each citizen implies that: (i) $\boldsymbol{\tau}(\mathbf{p}|\psi, \lambda_{\mathcal{A}})$ describes the government's best reply to all citizens' strategies, and (ii) the fixed points of $\Psi(\mathbf{p}|\boldsymbol{\tau}, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$ describe the citizens' equilibrium play against each other and the government's interrogation response. Thus, defining

$$\widetilde{\Psi}(\mathbf{p}|\psi, \omega, \lambda_{\mathcal{A}}, \underline{\rho}) \equiv \Psi\left(\mathbf{p}|\boldsymbol{\tau}(\mathbf{p}|\psi, \lambda_{\mathcal{A}}), \omega, \lambda_{\mathcal{A}}, \underline{\rho}\right),$$

the equilibria of this game are the $(\mathbf{p}^*, \boldsymbol{\tau}^*)$ such that: (i) $\mathbf{p}^*$ is a fixed point of $\widetilde{\Psi}(\mathbf{p}|\psi, \omega, \lambda_{\mathcal{A}}, \underline{\rho})$, and (ii), $\boldsymbol{\tau}^* = \boldsymbol{\tau}(\mathbf{p}^*|\psi, \lambda_{\mathcal{A}})$. Our main result is as follows:

Theorem 1. *Suppose $\lambda_A < 1/2$ and $\omega, \psi \in [0, 1]$. The set of all equilibria is given by:*

1. *(UTE1). For $(\lambda_{\mathcal{A}}, \omega) \in \left[\left(0, \frac{\psi^2}{1+\psi^2}\right) \times \left[0, \sqrt{\lambda_{\mathcal{A}}}\right)\right] \cup \left[\left[\frac{\psi^2}{1+\psi^2}, 1/2\right) \times \left[\frac{\lambda_{\mathcal{A}}}{\sqrt{1-\lambda_{\mathcal{A}}}}, \sqrt{\lambda_{\mathcal{A}}}\right]\right]$, unequal treatment against the majority, with a non-homogeneous and fully segregated society is the unique strict equilibrium:*

$$(p^*_{\mathcal{AA}}, p^*_{\mathcal{AB}}, p^*_{\mathcal{BA}}, p^*_{\mathcal{BB}}) \simeq \left(\left[\!\left[\frac{\omega}{\psi\sqrt{\lambda_{\mathcal{A}}}}\right]\!\right], 0, 1, \left[\!\left[\frac{\omega}{\sqrt{\lambda_{\mathcal{B}}}}\right]\!\right]\right)$$

   and

$$(\tau^*_{\mathcal{A}}, \tau^*_{\mathcal{B}}) \simeq (\psi, 1).$$

2. *(UTE2). For $(\lambda_{\mathcal{A}}, \omega) \in \left[(0, 1-\psi] \times \left(\sqrt{\lambda_{\mathcal{A}}}, \frac{\sqrt{\lambda_{\mathcal{A}}}}{1-\psi}\right]\right] \cup \left[(1-\psi, 1/2) \times \left(\sqrt{\lambda_{\mathcal{A}}}, 1\right]\right]$, unequal treatment against the majority, with a non-homogeneous and partially segregated society is the unique strict equilibrium:*

$$(p^*_{\mathcal{AA}}, p^*_{\mathcal{AB}}, p^*_{\mathcal{BA}}, p^*_{\mathcal{BB}}) = \left(1, \frac{\omega^2 - \lambda_A}{\lambda_B}, 1, \frac{\sqrt{\omega^2(\lambda_{\mathcal{B}} - \lambda_{\mathcal{A}}) + \lambda_A^2}}{\lambda_{\mathcal{B}}}\right)$$

   and

$$(\tau^*_{\mathcal{A}}, \tau^*_{\mathcal{B}}) = \left(\psi - (1-\psi)\frac{\omega^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{A}}}, 1\right).$$

3. *(ETE). Equal treatment with a homogeneous society is a (non-strict) equilibrium:*

$$p^*_{gh} = \left[\!\left[\frac{\omega}{\psi}\right]\!\right] \quad \textit{for all } g, h, \in \{\mathcal{A}, \mathcal{B}\}$$

and

$$(\tau^*_{\mathcal{A}}, \tau^*_{\mathcal{B}}) = (\psi, \psi).$$

3.3.1 Discussion

There are a number of results that follow from Theorem 1. It establishes the existence of unequal treatment equilibria, and describes several key features of the resulting civil liberties and social structures under such equilibria. Foremost, under asymmetric strategies that condition on group membership, there can be multiple equilibria. Equal treatment (ETE), where the government and citizens ignore group membership, is a (non-strict) equilibrium for any economy $(\psi, \omega, \lambda_{\mathcal{A}})$. Such equilibrium simply replicates the unique equilibrium with endogenous civil liberties we discussed in subsection 2.4. This is no surprise, as the group labels in our model are economically irrelevant. In an equal treatment equilibrium, the belief that the government will use the same civil liberties standard for both groups justifies homogeneous socialization rates within and across them. A homogeneous society, in turn, implies that there is no value for the government from interrogating the groups at different rates. This is a key insight from our analysis: heterogeneous socialization rates across groups are a necessary condition for unequal treatment to be of any value to the government.[36]

Indeed, for the economies described in parts 1 and 2 of Theorem 1, there exists an additional strict equilibrium that entails both unequal treatment (UTE) and some heterogeneity in socialization rates across groups. These correspond to corner solutions to the government's best reply, as illustrated in panel (b) of Figure 4. When a UTE exists, it is the unique strict equilibrium. In any such equilibrium, the government unfavorably treats the larger group. Moreover, unequal treatment for this group is maximal in the sense that the whole group gets interrogated. The favorably treated group (the minority), in contrast, is subject to an interrogation rate weakly lower than ψ. The extent of inequality in treatment across groups is thus pinned down by how favorably the minority is treated. In an unequal treatment equilibrium, the belief that the government will target the majority with a high interrogation rate gives citizens of both groups incentives to reduce the intensity with which they socialize with members of the majority. This leads to a segregated and less cohesive social structure that weakens the effectiveness of social contagion of civic unrest. Weakened contagion relaxes the no-contagion constraints, allowing the government to impose a high interrogation rate on the majority group without triggering contagion on the minority, thus fulfilling the citizens' belief of unequal treatment. Thus, in the parameter regions where UTE exist, multiplicity is sustained by different self-fulfilling beliefs

[36]Note that when $p_{\mathcal{AA}} = p_{\mathcal{AB}} = p_{\mathcal{BA}} = p_{\mathcal{BB}}$, the no contagion constraints for both groups exactly coincide, and thus each group's constraint binds if the constraint for the other group binds. The government cannot improve upon equal treatment without triggering a riot. Moreover, in this case the slope of the government's indifference curves coincides with the slope of the no-contagion constraints, which is the reason why the ETE from Theorem 1 is not a strict equilibrium.

about civil liberties and patterns of socialization. Unequal treatment and uneven socialization across groups sustain each other: the government will only chose to exercise unequal treatment when society exhibits some segregation, and individuals will only socialize asymmetrically across groups when the government treats both groups differently.

Figure 5 presents diagrams illustrating the parameter regions in $(\lambda_{\mathcal{A}}, \omega)$ space where the different types of equilibria exist, and how these regions change as we vary ψ, the parameter capturing civic values. Self-fulfilling beliefs sustaining unequal treatment are not consistent in economies with relatively large minorities and relatively strong civil liberties (high ω), and in economies with relatively small minorities and relatively weak civil liberties (low ω). As ψ increases, the regions where multiplicity (and thus unequal treatment) is possible expand. For $\psi \approx 1$, when civil society is unable to pose a riot threat, unequal treatment can be sustained in all economies. Unequal treatment equilibria of the first type described in Theorem 1 arise in economies in the south-east region of the parameter space, where the minority is relatively large, and civil liberties are relatively weak (below the curve $\omega = \sqrt{\lambda_{\mathcal{A}}}$). Unequal treatment equilibria of the second type described in Theorem 1 arise, in contrast, in economies in the north-west region of the parameter space, where the minority is relatively small, and civil liberties are relatively strong (above the curve $\omega = \sqrt{\lambda_{\mathcal{A}}}$). The figure also illustrates that even for $\psi \approx 0$, there are economies where (type 1) UTE will still exist (green lens-shaped region in subfigure (a)). In this case, however, type 2 UTE vanish.

3.3.2 Social structure

Theorem 1 has sharp implications over the resulting equilibrium social structures. Before discussing them, we introduce two definitions:

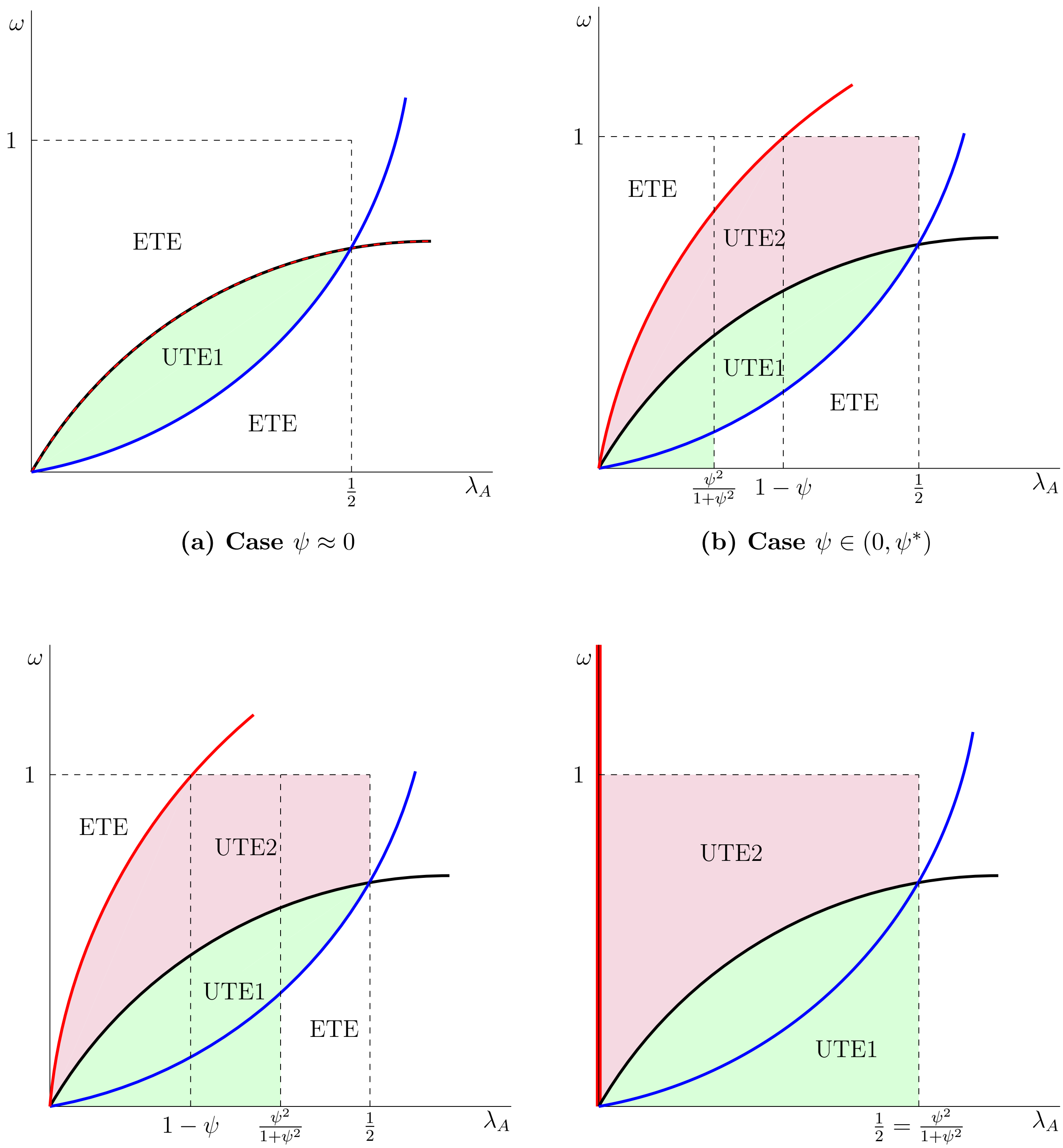
Definition 2. ***Cohesiveness*** $(\mathcal{H})$: *The likelihood that two randomly drawn citizens are friends with each other is a measure of society's cohesiveness:*

$$\mathcal{H} = \lambda_{\mathcal{A}}^2 p_{\mathcal{A}\mathcal{A}}^2 + 2\lambda_{\mathcal{A}}\lambda_{\mathcal{B}} p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}} + \lambda_{\mathcal{B}}^2 p_{\mathcal{B}\mathcal{B}}^2.$$

Definition 3. ***Segregation*** $(\mathcal{S})$: *The average absolute difference across groups in intra-group socialization compared to cross-group socialization is a measure of society's segregation:*

$$\mathcal{S} = \lambda_{\mathcal{A}} |p_{\mathcal{A}\mathcal{A}}^2 - p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}| + \lambda_{\mathcal{B}} |p_{\mathcal{B}\mathcal{B}}^2 - p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}|.$$

In the context of our model, $\mathcal{H}$ and $\mathcal{S}$ are simple statistics that capture the key aggregate features of society that our model speaks to: as a measure of cohesiveness, the overall density of social ties across citizens; as a measure of segregation, what amounts to the dissimilarity index (see Davis et al. (2019); Echenique and Fryer (2007)), measuring the extent to which



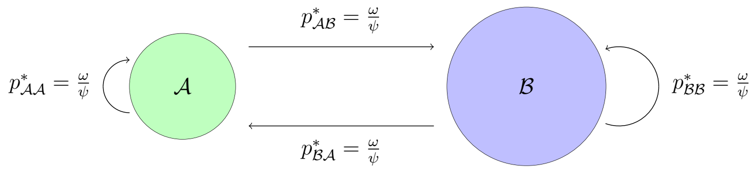
(a) Case $\psi \approx 0$

(b) Case $\psi \in (0, \psi^*)$

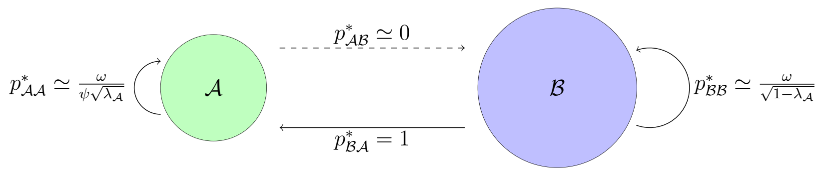
(c) Case $\psi \in [\psi^*, 1)$

(d) Case $\psi \approx 1$

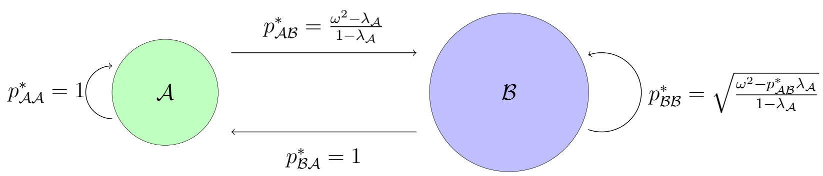
Figure 5: Types of Equilibria from Theorem 1: Each figure plots in $(\lambda_{\mathcal{A}}, \omega)$ space, the regions where only the Equal Treatment Equilibrium exists (in white), where the type 1 Unequal Treatment Equilibrium exists (in green), and where the type 2 Unequal Treatment Equilibrium exists (in pink), for different values of ψ. In all figures, the blue curve represents the condition $\omega = \lambda_{\mathcal{A}}/\sqrt{1-\lambda_{\mathcal{A}}}$, the red curve represents the condition $\omega = \sqrt{\lambda_{\mathcal{A}}}/\sqrt{1-\psi}$, and the black curve represents the condition $\omega = \sqrt{\lambda_{\mathcal{A}}}$. Subfigure (a) illustrates the case where $\psi \approx 0$. Subfigure (b) illustrates the case where $\psi \in (0, \psi^*]$, where ψ^* is the solution to $1 - \psi = \psi^2/(1+\psi^2)$. Subfigure (c) illustrates the case where $\psi \in [\psi^*, 1)$. Subfigure (d) represents the case where $\psi \approx 1$.



(a) Equilibrium Social Structure under Equal Treatment. All players ignore the arbitrary group labels, leading to a homogeneous society where all citizens have the same degree, and where segregation is low.



(b) Equilibrium Social Structure under Unequal Treatment − 1. Members of the group subject to a high interrogation rate –the majority– have a lower degree than members of the group subject to a low interrogation rate –the minority–. Members of the group subject to a low interrogation rate do not socialize with members of the group subject to a high interrogation rate, leading to complete segregation.



(c) Equilibrium Social Structure under Unequal Treatment − 2. Members of the group subject to a high interrogation rate –the majority– have a lower degree than members of the group subject to a low interrogation rate –the minority–. Members of the group subject to a low interrogation rate socialize at a low rate with members of the group subject to a high interrogation rate, leading to partial segregation.

Figure 6: Equilibrium Social Structures from Theroem 1.

socialization choices towards each group differ by group.[37] It is illustrative to compare these statistics under the UTEs and under the fully symmetric equilibrium from subsection 2.4. There, $\mathcal{H}$ reduces to the average degree of citizens, and by construction, in that setting $\mathcal{S} = 0$. In the equal treatment equilibria from Theorem 1, which we illustrate graphically in Figure 6a, $\mathcal{H} = [\![\omega/\psi]\!]^2$ similarly coincides with average degree, and $\mathcal{S} = 0$ as expected.

Consider, in contrast, the first type of unequal treatment equilibrium from Theorem 1. We illustrate its implied social structure in Figure 6b. Here members of the minority completely cut

[37]The literature has proposed and debated a wide variety of measures of cohesiveness and segregation. Echenique and Fryer (2007), for example, suggest that measures of segregation should have the feature that "an individual is more segregated the more segregated are the agents with whom she interacts". We do not use a recursive measure of segregation here because we only study equilibria that are symmetric within groups (see also Esteban and Ray (1994); Fryer (2011)).

off their socialization with the majority ($p^*_{\mathcal{AB}} \simeq 0$), leading to a highly segregated society where all socialization happens exclusively within groups.[38] This is despite the willingness of citizens from the majority to socialize with members of the minority ($p^*_{\mathcal{BA}} = 1$). In this equilibrium, the average degree of citizens from the minority is higher than the average degree of citizens from the majority ($(\omega/\psi)^2$ vs ω^2). Here the segregation index takes the value $\mathcal{S} = (\omega/\psi)^2(1+\psi^2)$. Paradoxically, this is decreasing in ψ; as civil society becomes stronger, segregation increases. This happens because in a UTE1 equilibrium, the minority's incentives to completely segregate from the majority do not change with marginal changes in ψ, whereas their willingness to socialize within their own group increases, leading to a larger gap between within-group and cross-group socialization rates. The increased willingness of minority citizens to socialize within their group also implies that cohesiveness, equal to $\mathcal{H} = (\omega/\psi)^2(\psi^2 + (1-\psi^2)\lambda_{\mathcal{A}})$, is also decreasing in ψ. Under UTE1, more cohesive societies are also more segregated, and $\mathcal{H}$ and $\mathcal{S}$ covary positively with changes in ψ. Finally, in this equilibrium $p^*_{\mathcal{AA}}$ is decreasing, while $p^*_{\mathcal{BB}}$ is increasing in $\lambda_{\mathcal{A}}$. While their net effect makes cohesiveness increasing in the size of the minority, they exert exactly offsetting influences over $\mathcal{S}$, making equilibrium segregation invariant to $\lambda_{\mathcal{A}}$.

Figure 6c illustrates the resulting social structures under the second type of UTE from Theorem 1. To avoid contagion over the minority, here the government reduces below ψ the interrogation rate on that group. This allows the minority to become a fully connected group ($p^*_{\mathcal{AA}} = 1$), and to socialize with the unequally treated majority albeit at a lower rate ($p^*_{\mathcal{AB}} > 0$). As in the UTE1, the unequally treated group attempts to fully socialize with the minority, so that in both cases, the degree of segregation is limited only by the minority's willingness to socialize with the majority. Indeed, it is precisely the increased social contact between groups what tightens the no-contagion constraints in this case, illustrating that less segregated societies are more successful at disciplining the government. Because the minority experiences a low interrogation rate, members of the unequally treated majority prefer to undertake more intense cross-group than within-group socialization efforts. However, the low out-group socialization rate of the minority leads, in equilibrium, to a social structure where members of the majority have more friends from their own group than from the minority ($p^*_{\mathcal{AB}}p^*_{\mathcal{BA}} < p^{*2}_{\mathcal{BB}}$). Also note that in equilibrium, within-group socialization efforts of the majority and cross-group socialization efforts of the minority are strategic substitutes. What in the absence of a government would be a game of strategic complements (as the socialization technology is a simple quadratic matching function), turns into a game of strategic substitutes as the government chooses differential socialization rates across groups to prevent collective action contagion.

Social structures under UTE1 and UTE2 look very different from each other. Under UTE2, the degree of both types of citizens is ω^2, cohesiveness is $\mathcal{H} = \omega^2$ as well, and the segregation

[38] Note that in this case one of the cross-group socialization rates goes to zero, so one of the equilibrium no-contagion constraints from Figure 4 is a horizontal line, and the other one is a vertical line.

index is $\mathcal{S} = 2(\lambda_{\mathcal{A}}/\lambda_{\mathcal{B}})(1-\omega^2)$. Thus, there is some socialization between groups, and both $\mathcal{H}$ and $\mathcal{S}$ are invariant to the strength of civic values. In sharp contrast with UTE1, under UTE2 more cohesive societies are less segregated, as $\mathcal{H}$ and $\mathcal{S}$ covary negatively with changes in ω. Also in contrast with UTE1, although under UTE2 $p^*_{\mathcal{AA}}$ and $p^*_{\mathcal{BB}}$ are similalry decreasing and increasing in $\lambda_{\mathcal{A}}$, here equilibrium cohesiveness is invariant to the size of the minority while equilibrium segregation increases as the groups become closer in size. This is driven by the government's interrogation behavior: as the size of the minority increases, the government can afford a higher interrogation rate on this group, reducing cross-socialization incentives.[39] Finally, it is worth pointing out that holding fixed the value of ψ, the extent of inequality in treatment (as measured by $\tau^*_{\mathcal{B}} - \tau^*_{\mathcal{A}}$), is strictly higher under UTE2 than under UTE1. This is because in both types of equilibria the majority experiences $\tau^*_{\mathcal{B}} = 1$, while the minority experiences a lower interrogation rate under UTE2 than under UTE1.[40]

Our results from Theorem 1 stand in contrast to the previous literature on intergroup socialization. As Bisin and Verdier (2011) point out, to rationalize segregation all models of socialization, starting at least with Schelling (1969), rely on *imperfect empathy* –assumed differences in payoffs, even if small, from interacting with individuals of different types–. Our model assumes no such differences. Society may still experience segregation even when citizens have no inherent bias for interacting with their own type. In our setting, self-fulfilling beliefs about differences in the government's treatment of people from different groups induce the heterogeneity in willingness to socialize differentially across groups.

3.3.3 Equilibrium payoffs and coordination failure

In the unequal treatment equilibria we have discussed, socialization and interrogation rates differ from those in an equal treatment equilibrium. Under the UTE2, for example, citizens from group $\mathcal{A}$ experience a lower interrogation rate than under the ETE. Even under a UTE1, where citizens from group $\mathcal{A}$ experience the same interrogation rate they do under an ETE and citizens from group $\mathcal{B}$ experience a higher one, their socialization choices are depressed compared to those under an ETE. This raises the question of whether the government is aggregating more information under the unequal treatment equilibria, and even whether citizens are better or worse off under a UTE or an ETE.

Proposition 3. *Fix an economy $(\psi, \omega, \lambda_{\mathcal{A}})$ where unequal treatment is an equilibrium. The government's ex-ante payoff is strictly higher under the unequal treatment equilibrium than*

[39]Notice from (NC$\mathcal{A}$) that starting from an interrogation rate $t_{\mathcal{A}} < \psi$, an increase in group size relaxes the constraint as it increases the right-hand side more than one to one compared to the left-hand side. This is because in our model, the contagion technology makes collective action harder to achieve in larger groups.

[40]Under UTE1, inequality in treatment is $\tau^*_{\mathcal{B}} - \tau^*_{\mathcal{A}} = 1 - \psi$. Under UTE2, inequality in treatment is $\tau^*_{\mathcal{B}} - \tau^*_{\mathcal{A}} = (1-\psi)(\omega^2/\lambda_A)$, which is strictly larger than $1-\psi$ as $\omega^2 > \lambda_A$ for UTE2 to exist.

under the equal treatment equilibrium only if $\omega > \psi$*, this is, when the equal treatment equilibrium implies a fully cohesive society.*

Proposition 3 highlights the importance of the government's commitment problem as a key element of our model. It arises from the tension between the ex-ante and the ex-post value for the government of strong civil liberties. Ex-ante, civil liberties protections give citizens incentives to socialize, making interrogations more informative. Ex-post, they ease citizens' collective action capacity, constraining the government's ability to interrogate widely. For economies where $\omega < \psi$ (so that the government's information aggregation technology is very effective or punishments on arrested citizens can be very harsh and society's civic values are weak), the commitment problem is present: the government would be better off if it could commit to equal treatment. The reduction in information aggregation stemming from the erosion of the social fabric induced by expectations of unequal treatment outweighs the increased information collection possible under the higher interrogation rate on the unequally treated group. Even when the government does worse under an UTE than under an ETE, if citizens decide to segregate, at the interim stage the government's best reply is to exercise unequal treatment. Thus, in our model segregation behavior by citizens is as much a cause of unequal treatment by government, as expectations of government discrimination are a cause of a segregated society. This is in contrast to models of 'divide and rule', for example, where governments exploit cleavages across groups. Such models rely on underlying differences between the groups (productivity, comparative advantages, etc.), and the governments benefit at the expense of the citizenry which needs not be the case here (e.g., Acemoglu et al. (2004); i Miquel (2007)).

In some economies where $\omega > \psi$, however, the government's ex-ante payoff can be larger under an UTE than under an ETE. These are economies with strong civil liberties and strong collective action capacity, so that, as Proposition 3 points out, the ETE leads to a fully cohesive society ($p^*_{gh} = 1$ for all g, h). In this case the government can aggregate too little information in the ETE, so that the increased interrogation rate on the majority that it can impose under the UTE does allow for more information aggregation despite the erosion of social cohesion it entails.[41] Moving on to the citizens' payoffs, we have the following result:

Lemma 4. *Fix an economy* $(\psi, \omega, \lambda_{\mathcal{A}})$ *where unequal treatment is an equilibrium. The equilibrium payoff for citizens of both groups is lower under the UTE than under the ETE.*

Regardless of whether the government is worse or better off under an UTE than under the corresponding ETE, citizens are always worse off in the presence of unequal treatment, *including* the members of the more favorably treated group in the equilibria where the interrogation rate

[41] $\omega > \psi$ is only a necessary condition for the government's payoff to be higher under a UTE than under an ETE. The sufficient conditions are $\omega > \sqrt{\psi(1 + \lambda_{\mathcal{A}})}$ under a UTE1, and $\omega > \sqrt{\psi/(1 - \psi)}$ under a UTE2.

they experience is lower than ψ. Unequal treatment equilibria, hence segregation, represent coordination failures from the point of view of citizens of both groups.

Social segregation in the presence of coordination failure is reminiscent of models where social norms arise to sustain non-myopic behavior as in the caste model of Akerlof (1976) or the class systems model of Cole et al. (1998). In Akerlof's model, for example, a segregated caste system is sustained by the a norm that excludes from the caste anyone who interacts with members of another caste. In our model, in contrast, members of the more favorably treated group reduce their socialization with members of the unfavorably treated group because the high interrogation rate imposed by the government on this group makes it costly to interact with them. Neither members of the favorably treated group nor the government face inter-temporal repercussions from deviating from equilibrium behavior. In our setting, social norms are not necessary to sustain segregation. In fact, a caste system along the lines of Akerlof (1976) can only arise in the context of our model if group sizes are such that the optimal interrogation rates for the government *do not* entail unequal treatment.[42]

Equilibrium segregation in our model is also of a different nature than in Lang (1986), where a (transaction) cost of interaction between the two groups (in the form of a language barrier) is a primitive of the model. Here the differential cost from interacting across groups is endogenous. It is also in contrast to other models of socialization such as Alesina and LaFerrara (2000)'s model of participation in collective activities, where segregation can make one group better off at the expense of the other.[43]

[42]Suppose a group with label $\mathcal{B}$ and endogenous size $\lambda_{\mathcal{B}}$ is the outcast group. A social norm exists according to which any citizen who forms a link with an outcast is also an outcast (naturally, here we must allow for $\underline{\rho} = 0$). Group identities and socialization choices are determined simultaneously. Each citizen chooses $(\rho_{i,\mathcal{A}}, \rho_{i,\mathcal{B}})$, and $\mathcal{B}$ is determined as $\mathcal{B} = \{i \in \mathcal{B} \text{ iff } \rho_{i\mathcal{B}} > 0\}$. As in our benchmark model, interrogation rates $(\tau_{\mathcal{A}}, \tau_{\mathcal{B}})$ are determined after socialization decisions have taken place. Notice that by construction, $\mathcal{A}$ and $\mathcal{B}$ are two disjoint groups. Consider symmetric equilibria where members of $\mathcal{A}$ play $(\rho_{\mathcal{A}\mathcal{A}}, 0)$, and members of $\mathcal{B}$ play $(0, \rho_{\mathcal{B}\mathcal{B}})$. Assuming no agent is born an outcast, $\mathcal{A} = \varnothing$ and $\mathcal{B} = \varnothing$ are both equilibrium group compositions. Are there (symmetric) equilibria where $\lambda_{\mathcal{B}} \neq 0$? Given $p_{\mathcal{A}\mathcal{A}}, p_{\mathcal{B}\mathcal{B}}$ and the expectations $t_{\mathcal{A}}, t_{\mathcal{B}}$, citizens' best replies can be characterized as follows: citizen i playing $(p_{i\mathcal{A}}, p_{i\mathcal{B}})$ has payoff

$$\begin{cases} \sqrt{p_{i\mathcal{A}} p_{\mathcal{A}\mathcal{A}} \lambda_{\mathcal{A}}} - \frac{1}{2\omega} p_{i\mathcal{A}} p_{\mathcal{A}\mathcal{A}} \lambda_{\mathcal{A}} t_{\mathcal{A}} \text{ if } p_{i\mathcal{B}} = 0 \\ \sqrt{p_{i\mathcal{B}} p_{\mathcal{B}\mathcal{B}} \lambda_{\mathcal{B}}} - \frac{1}{2\omega} p_{i\mathcal{B}} p_{\mathcal{B}\mathcal{B}} \lambda_{\mathcal{B}} t_{\mathcal{B}} \text{ if } p_{i\mathcal{B}} > 0 \end{cases}$$

Thus, in equilibrium,

$$\max_{p_{i\mathcal{A}}} \sqrt{p_{i\mathcal{A}} p_{\mathcal{A}\mathcal{A}} \lambda_{\mathcal{A}}} - \frac{1}{2\omega} p_{i\mathcal{A}} p_{\mathcal{A}\mathcal{A}} \lambda_{\mathcal{A}} t_{\mathcal{A}} = \max_{p_{i\mathcal{B}}} \sqrt{p_{i\mathcal{B}} p_{\mathcal{B}\mathcal{B}} \lambda_{\mathcal{B}}} - \frac{1}{2\omega} p_{i\mathcal{B}} p_{\mathcal{B}\mathcal{B}} \lambda_{\mathcal{B}} t_{\mathcal{B}},$$

which implies

$$\frac{\omega}{2t_{\mathcal{A}}} = \frac{\omega}{2t_{\mathcal{B}}} \Longrightarrow t_{\mathcal{A}} = t_{\mathcal{B}}.$$

[43]In classic labor market discrimination models (e.g., Coate and Loury (1993); Foster and Vohra (1992)), coordination failure happens only within the discriminated group: the advantaged group is unaffected. In subsequent labor market discrimination models (e.g., Mailath et al. (2000); Moro and Norman (2004)), the

3.3.4 Changes in the economic environment

Our discussion above already described how equilibrium socialization and civil liberties under asymmetric strategies change with relative group sizes and civic engagement. We now turn to a description of the comparative statics with respect to other parameters of interest. Conveniently, these affect equilibrium quantities exclusively through ω, the reduced-form parameter capturing how the information technology shapes socialization incentives. Because the ETE mimics the equilibrium under symmetric strategies, here we discuss only the UTEs. In all unequal treatment equilibria, comparative statics over social structure statistics –socialization rates, cohesiveness, and segregation–, and over civil liberties -interrogation rates– are monotone in the key parameters of the model (within an equilibrium). For the remainder of the analysis, we will rely on the following Corollary to Theorem 1:

Corollary 1. *Comparative statics with respect to ω:*

1. *UTE1:*

$$\frac{\partial p^*_{\mathcal{AA}}}{\partial \omega} > 0, \quad \frac{\partial p^*_{\mathcal{AB}}}{\partial \omega} = \frac{\partial p^*_{\mathcal{BA}}}{\partial \omega} = 0, \quad \frac{\partial p^*_{\mathcal{BB}}}{\partial \omega} > 0,$$
$$\frac{\partial \mathcal{H}}{\partial \omega} > 0, \quad \frac{\partial \mathcal{S}}{\partial \omega} > 0, \quad \frac{\partial \tau^*_{\mathcal{A}}}{\partial \omega} = \frac{\partial \tau^*_{\mathcal{B}}}{\partial \omega} = 0.$$

2. *UTE2:*

$$\frac{\partial p^*_{\mathcal{AA}}}{\partial \omega} = 0, \quad \frac{\partial p^*_{\mathcal{AB}}}{\partial \omega} > 0, \quad \frac{\partial p^*_{\mathcal{BA}}}{\partial \omega} = 0, \quad \frac{\partial p^*_{\mathcal{BB}}}{\partial \omega} > 0,$$
$$\frac{\partial \mathcal{H}}{\partial \omega} > 0, \quad \frac{\partial \mathcal{S}}{\partial \omega} < 0, \quad \frac{\partial \tau^*_{\mathcal{A}}}{\partial \omega} < 0, \quad \frac{\partial \tau^*_{\mathcal{B}}}{\partial \omega} = 0.$$

Increases in the likelihood of a threat χ:

$$\frac{\partial \omega}{\partial \chi} > 0 \iff \frac{\underline{\chi}_L}{1 - \underline{\chi}_L} > \frac{b_1}{b_0}. \tag{15}$$

Whether a threat that is perceived to be more likely (e.g., the US following the 9/11 terrorist attacks, or Turkey after the failed coup attempt of 2016) increases or decreases incentives for socialization depends on the lower bound on the standard of proof, and on the likelihood ratio. Recall that b_0 measures how fast marginal increases in information s_i decrease the likelihood of a wrong signal of threat membership. In turn, b_1 measures how fast marginal increases in information s_i increase the likelihood of a correct signal of threat membership. In economies where b_1/b_0 is sufficiently small, marginal increases in information increase the likelihood of a threat signal for a threat member by less than they increase the likelihood of a no-threat signal

advantaged group benefits from discrimination on the disadvantaged group. In our model, both groups are hurt by unequal treatment albeit to different extents, and the coordination failure involves citizens from both groups.

for a non-threat member. At higher values of χ, citizen i is more likely to be a member of the threat, making social ties more valuable from her ex-ante point of view. As the standard of proof becomes stricter, the larger the range where these incentives hold.

Thus, from Corollary 1, when the inequality in (15) holds, a more likely threat leads to more cohesiveness and more segregation under UTE1, and it leads to more cohesiveness, less segregation, and more unequal treatment between groups (a wider gap between $\tau^*_{\mathcal{A}}$ and $\tau^*_{\mathcal{B}}$) under UTE2. When the inequality is reversed, the comparative statics are the opposite.

Improvements in the information technology (b_0, b_1)**:**

$$\frac{\partial \omega}{\partial b_0} < 0, \quad \frac{\partial \omega}{\partial b_1} < 0.$$

Improvements in the efficiency of the government's information aggregation technology (e.g., better internet surveillance protocols, diffusion of videocamera use by law enforcement) reduce incentives for socialization. Recall that a signal $\theta_i = 1$ is necessary for citizen i to be arrested. Conditional on such a signal, the posterior probability of threat membership will be higher the better the technology at correctly detecting threat members (the larger b_1), and the better the technology at avoiding wrong threat membership signals (the larger b_0). Because citizens unambiguously benefit from a lower probability of a signal $\theta_i = 1$ for them, information technologies that make less of both type I and type II errors will reduce ex-ante socialization incentives.

Corollary 1 implies that under UTE1, more efficient information aggregation technologies lead to lower cohesiveness and segregation. Under UTE2, they lead to lower cohesiveness, higher segregation, and a higher interrogation rate on the more favorably treated group.

Improvements in the 'standard of proof' $[\underline{\chi}_L, \underline{\chi}_H]$**:** To consider improvements in the expected 'standard of proof', we fix the size of the support of $\underline{\chi}$. In this way its variance is fixed, and our comparative statics results refer only to changes in the mean of $\underline{\chi}$. Let $\Delta \equiv \underline{\chi}_H - \underline{\chi}_L$ be a fixed quantity. We have that

$$\frac{\partial \omega}{\partial \underline{\chi}_H} > 0 \iff \frac{\chi}{1-\chi} > \frac{b_0}{b_1}. \tag{16}$$

Perhaps surprisingly, whether a more stringent standard of proof leads to stronger socialization incentives is not unambiguous. It depends on other features of the informational environment. As (16) indicates, higher ranges for the standard of proof requirement, which make it harder for the government to undertake arrests ex-post, increase socialization incentives if and only if b_0/b_1 is sufficiently small. In economies where b_0/b_1 is sufficiently small, marginal increases in information increase the likelihood of a threat signal for a threat member by more than they increase the likelihood of a no-threat signal for a non-threat member. In such case, additional information hurts citizens ex-ante, and their willingness to socialize will only strengthen when they face stronger standard of proof protections. As the likelihood of the threat becomes higher, the larger the range where these incentives hold.

Corrolary 1 indicates that when the inequality in (16) holds, a more stringent standard of proof leads to more cohesiveness and segregation under UTE1, and to more cohesiveness, less segregation, and more unequal treatment between groups (a wider gap between $\tau^*_{\mathcal{A}}$ and $\tau^*_{\mathcal{B}}$) under UTE2. When the inequality is reversed, the comparative statics are the opposite.

4 Extensions

4.1 Unequal Treatment against the Minority

In all the unequal treatment equilibria from Theorem 1, members of the the majority group are unfavorably treated. Because in our model the government does not have an inherent preference for one group over the other, the inequality in treatment across groups is not driven by differences in their political influence. Rather, it is driven by how social structure shapes the government's incentives to aggregate information.

Here we discuss an extension of the model where unequal treatment against the minority is possible.[44] Recall that in the baseline model we supposed that for collective action to be successful, contagion had to reach all citizens. This is a simple case of a more general model where the success of collective action requires the contagion of share $\nu \leq 1$ of citizens. Suppose, thus, that $\nu < 1$. Naturally, avoiding succesful collective action is now harder for the government. While (NC$\mathcal{A}$) and (NC$\mathcal{B}$) are unchanged, the no-riot constraint now takes the form

$$\lambda_{\mathcal{A}}\Gamma_{\mathcal{A}}(t_{\mathcal{A}}) + \lambda_{\mathcal{B}}\Gamma_{\mathcal{B}}(t_{\mathcal{B}}) \leq \nu, \qquad \text{(NRC")}$$

as avoiding a riot requires not just preventing contagion in both groups, but also making sure that the share of reactive citizens is less than ν. If, for example, citizens from group $\mathcal{A}$ are all subject to contagion, the government must make sure that the number of reactive citizens in group $\mathcal{B}$ is sufficiently small that a riot is averted:

$$t_{\mathcal{B}} \leq \min\left\{\frac{\nu - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}, \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p^2_{\mathcal{BB}}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}$$

Note that for some values of ν and $\lambda_{\mathcal{A}}$ contagion within one group may be enough to make

[44] In the model of Mailath et al. (2000), relative group sizes similarly matter for the direction of labor market discrimination. There, group sizes are relevant as they determine the magnitude of the externality that is imposed on one group when firms search more intensively for workers from the other group.

(NRC") bind. If the majority is too large relative to ν, it will be infeasible for the government to exercise unequal treatment against citizens of that group. The question is whether in this case, there exist unequal treatment equilibria where the government exercises unequal treatment against the minority. The following result answers this question in the affirmative.

Lemma 5. *Suppose that $\lambda_{\mathcal{B}} > \nu > \psi\lambda_{\mathcal{B}} + \lambda_{\mathcal{A}}$.*[45] *The set of all equilibria is given by:*

1. *(UTE1). For $\omega < \sqrt{\lambda_{\mathcal{B}}}$, unequal treatment against the minority, with a non-homogeneous and fully segregated society is the unique strict equilibrium:*

$$(p^*_{\mathcal{AA}}, p^*_{\mathcal{AB}}, p^*_{\mathcal{BA}}, p^*_{\mathcal{BB}}) \simeq \left(\left[\!\left[\frac{\omega}{\sqrt{\lambda_{\mathcal{A}}}} \right]\!\right], 1, 0, \left[\!\left[\frac{\omega}{\psi\sqrt{\lambda_{\mathcal{B}}}} \right]\!\right] \right)$$

and

$$(\tau^*_{\mathcal{A}}, \tau^*_{\mathcal{B}}) \simeq (1, \psi).$$

2. *(UTE2). For $\omega > \sqrt{\lambda_{\mathcal{B}}}$, unequal treatment against the minority, with a non-homogeneous and partially segregated society is the unique strict equilibrium:*

$$(p^*_{\mathcal{AA}}, p^*_{\mathcal{AB}}, p^*_{\mathcal{BA}}, p^*_{\mathcal{BB}}) \simeq \left(\left[\!\left[\sqrt{\frac{\omega^2(\lambda_{\mathcal{B}} - \lambda_{\mathcal{A}}) + \lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}^2}} \right]\!\right], 1, \frac{\omega^2 - \lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}, 1 \right)$$

and

$$(\tau^*_{\mathcal{A}}, \tau^*_{\mathcal{B}}) \simeq \left(1, \psi - (1-\psi)\frac{\omega^2 - \lambda_{\mathcal{B}}}{\lambda_{\mathcal{B}}}\right).$$

3. *(ETE). Equal treatment with a homogeneous society is a (non-strict) equilibrium.*

Lemma 5 provides a sufficient condition for unequal treatment equilibria against the minority to exist (and fully characterizes the set of equilibria for the economies in that range of the parameter space). The result suggests that unequal treatment against minorities may be observed when unequally treating majorities is infeasible given their strength in numbers. It also highlights that in the benchmark model, the government's preference for unequally treating the majority is driven only by its interim incentive to aggregate as much information as possible. Moreover, the desire to segregate (fully or partially) by the group experiencing the lower interrogation rate is independent of its relative size, and depends only on how costly it is to interact with citizens being interrogated at a very high rate. Thus, the reason why the minority is the 'favored' group in the benchmark case is different from Olson (1971)'s well-known argument about the success of minorities being driven by their comparative ability to avoid free-rider problems. It is also in contrast with the more traditional view of civil liberties as societal protections for minorities from majorities.

[45] Notice that in this region of the parameter space, $\lambda_{\mathcal{A}} < \frac{1-\psi}{2-\psi} < 1/2$ so group $\mathcal{A}$ is indeed the minority.

4.2 Information Aggregation under Community Enforcement

We have considered an environment where citizens provide information to the government whenever they are interrogated. This, of course, hurts the citizens about whom information is revealed. While above we endogenized civil liberties (the limit on interrogations) through a collective action mechanism, here we provide an alternative, considering the existence of endogenous social norms limiting the ability of the government to interrogate effectively. Social norms such as Banfield (1958)'s *amoral familism* among Southern Italians, or the well-known codes of silence of the mafia (e.g., Servadio (1976)), for example, suggest that community enforcement of social norms against collaboration with the government may emerge and limit its ability to exploit the social structure to aggregate information.

To formalize this idea, consider an extension of our model (under symmetric strategies) where there is no limit on the number of citizens the government can interrogate, but where interrogated citizens can choose to resist sharing information about their friends. The government provides incentives in the form of punishments for resisting. We suppose that talking is publicly observed, so friends of a talking citizen may punish him for talking (ostracism, severing of economic relations, etc.). When the punishment for talking scales with the number of friends about whom an interrogated citizen talked, more cohesive social networks will be more effective at enforcing a code of silence. Citizens who resist are punishers.

Formally, we introduce two new sub-games: i) after a citizen is taken for interrogation, she decides whether to talk or resist. If she resists, the government imposes on her a cost $r_i \sim U[0, \tilde{r}]$, which is iid and realized at the time it is imposed. ii) This decision is observed by her $\tilde{d}_i$ punisher friends, who then impose a punishment $\tilde{r}\sqrt{\tilde{d}_i}$ if she talked, where $\tilde{r}$ is a constant. The extent of social punishment for talkers is determined by the mass of punishers and talkers. These masses, in turn, are determined by the cost of social punishment.

In symmetric equilibrium, all citizens choose a socialization rate p, so every citizen's degree is $d = p^2$. Denote by $r \in [0, \tilde{r}]$ the marginal resistance cost: if $r_i < r$, interrogated citizen i is willing to bear this cost, does not talk, and joins the group of punishers. If $r_i \geq r$, the punishment is too high and citizen i talks. Thus, $r/\tilde{r}$ is the fraction of punishers, and $1 - (r/\tilde{r})$ is the fraction of talkers. Accordingly, the mass of punisher friends is $\tilde{d} = d(r/\tilde{r})$, and the cost of talking is $\sqrt{dr\tilde{r}}$. The marginal talker is thus pinned down by $r = \min\left\{\tilde{r}, \sqrt{dr\tilde{r}}\right\}$.

This talking sub-game has two equilibria. The first is $r = 0$. Here all citizens are talkers, and none punish, so no citizen has an incentive to resist. We call it the all-talk equilibrium. It corresponds to our benchmark model in the case where $\tau = 1$. Because the continuation game is governed by the all-talk equilibrium, equilibrium socialization is simply $p^* = \omega$.

The second equilibrium of the talking sub-game is $r = d\tilde{r}$, which implies $d = r/\tilde{r}$. Fraction d of citizens are punishers and fraction $1 - d$ are talkers. We call it the community enforcement equilibrum. We now characterize the equilibrium socialization rate for this case. Consider a citizen i deciding on p_i given all other citizens choose p. Her degree will be $d_i = p_i p$. During her interrogation, she can resist and suffer cost r_i. Alternatively, she can talk and suffer the social punishment $\tilde{r}\sqrt{d_i d}$ since, in equilibrium, fraction d of her friends will be punishers. The ex-ante expected interrogation cost for citizen i is thus,

$$\mathbb{E}_{r_i}\left[\min\left\{r_i, \tilde{r}\sqrt{d_i d}\right\}\right] = \tilde{r}\left(\sqrt{d_i d} - \frac{1}{2}d_i d\right).$$

Citizen i also must consider the expected cost of being arrested. There will be $d_i(1-d)$ talkers among her friends, so the government will receive $s_i = d_i(1-d)$ clues about her. The expected arrest cost is thus $\frac{d_i(1-d)}{2\omega}$, and her ex-ante expected utility is proportional to

$$\sqrt{d_i} - \tilde{r}\left(2\sqrt{d_i d} - \frac{1}{2}d_i d\right) - \frac{d_i(1-d)}{2\omega}.$$

Taking the first order condition and imposing symmetry ($d_i = d$), we find

$$\frac{1}{\sqrt{d}} - \left(\tilde{r} + \frac{1}{\omega}\right)(1-d) = 0 \quad \iff \quad p(p-1)(p+1) + a = 0$$

since in equilibrium $p = \sqrt{d}$, and $a \equiv ((1/\omega) + \tilde{r})^{-1}$. This cubic equation has a solution iff $a \leq \frac{2}{3\sqrt{3}}$, in which case it has two positive roots in $[0,1]$. The first solution is increasing in a, ranging from $p = 0$ to $p = 1/3$ as a increases from 0 to $\frac{2}{3\sqrt{3}}$. The second solution is decreasing in a, ranging from $p = 1$ to $p = 1/3$ as a increases from 0 to $\frac{2}{3\sqrt{3}}$.[46]

5 Conclusion

Civil liberties in the form of restrictions on the use of coercion by government agents are a key buffer between citizens and the state. Much of this coercion is directed toward aggregating information that is distributed across the social network of citizens. The social structure, in turn, mediates both the government's ability to collect information efficiently, and the citizens' ability to resist it. In this paper we have offered a first look at how the governments' ability to

[46]This simple extension rationalizes the decision to reveal information to the government. It does not however, provide a rationale for why punishers would want to punish. We can justify equilibrium punishment with the following argument: suppose that part of the social norm prescribes that punishers who refuse to punish talkers are treated as talkers and punished accordingly. As long as punishers have a large enough number of friends, punishing will be incentive compatible. This is true in the symmetric equilibrium we described above. What if a positive-mass coalition of punishers wanted to jointly deviate and not punish? It is easy to verify that in this model, no coalition within the set of punishers can benefit from jointly deviating: for any positive-mass coalition, the reduction in expected punishment (from there being less punishers) is strictly lower than the margin by which any citizen prefers to resist talking over talking.

collect information and citizens' socialization decisions are jointly determined.

We have argued here that when civil liberties are weak, governments attempting to exploit their coercive advantages will be ineffective at aggregating information because such efforts will erode the social network of citizens. This is because a cohesive social structure is necessary for information collection when information is distributed in the population. Iron Curtain governments were characterized by their unconstrained ability of to exercise coercion over their citizens, and concomitantly by mis-trustful societies with eroded social fabrics. The massive investments in intelligence agencies, secret police services, and prison camps of these governments may well have been a symptom of their ineffectiveness at aggregating information about their citizens. Thus, civil liberties that can be sustained in equilibrium not only protect citizens from the state; they also protect the government from itself.

Cohesive social structures facilitate information aggregation, but they also strengthen the ability of civil society to resist it. We have shown this opens the door to the possibility of unequal treatment, where the government treats ex-ante identical citizens differently. By making some citizens the targets of more interrogation, the government makes them unattractive partners for socialization. The government can thus provide incentives that fracture the social structure, weakening civil society's resistance, and leading to segregation. We showed here that unequal treatment is necessary for social segregation to arise, and segregation is necessary for unequal treatment to be justified. We also found these equilibria are robust when they exist, providing a novel rationale for segregation. These equilibria are reminiscent of the high levels of segregation along ethnic lines inside US prisons. An intriguing avenue for future research could explore whether ideas along the lines of our model can help understand inmates' socialization decisions and the corresponding behavior of guards and prison administrators.

Our model can be extended in several directions. It could be specialized, for example, to a setting where the underlying threat is an epidemic, so that socialization choices involve contagion externalities. Naturally, it also has many limitations. Throughout we took society's ability to engage in collective action as exogenous. In practice, civil liberties and the social structure likely shape some aspects of civic engagement. We also abstained from exploring the political economy shaping the government's information aggregation objective. Exploring these relationships would be a valuable avenue of future research.

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A Appendix

A.1 Discussion: some cross-country empirical patterns

In the model described in section 2 –under symmetric strategies–, as civil liberties worsen average socialization falls, and as civic engagement weakens, civil liberties worsen. The inelastic relationship between τ and p implied by the form of the no-riot constraint further predicts that conditional on ψ, there should be no relationship between p and τ. Measuring socialization, civil liberties, and civic engagement is difficult, and a cross-country comparison will be fraught with innumerable confounders. Despite these difficulties, we collected data from the World Values Survey (WVS) and the World Bank's World Development Indicators (WDI). We computed country-level proxies for p, τ, and ψ based on these sources. As a measure of p, we rely on the WVS, and compute for each country the average share of respondents answering affirmatively that they participate in one of the following: a group sport, a labor union, or an arts, environmental, professional, charitable, consumer, or other organization.[47] As a measure of (the negative of) ψ we similarly use the WVS, and compute for each country the average share of respondents answering affirmatively that they would participate in a demonstration or protest, or would sign a petition to the government. We see these responses as signaling people's willingness to engage in broad social interaction, and to participate in collective action. Finally, as a measure of (the negative of) τ, we rely on the WDI, and compute for each country the average of the standardized indices measuring the prevalence of 'Rule of Law' and 'Voice and Accountability'.

	τ		p			
	(1)	(2)	(3)	(4)	(5)	(6)
τ			-2.19	-2.26	-0.92	-1.16
			(0.57)	(0.71)	(0.59)	(0.71)
ψ	0.03	0.01			-0.11	-0.09
	(0.004)	(0.003)			(0.02)	(0.03)
Income p.c	No	Yes	No	Yes	No	Yes
No. of Countries	94	90	92	88	88	84
R^2	0.35	0.70	0.21	0.29	0.30	0.38

Table 1: Cross-country relationships between p, τ, and ψ. The table presents coefficients from cross-country regressions. All models include year fixed effects. In columns controlling for income per capita, we include a third-degree polynomial on the log of income per capita at constant prices. τ is measured as the negative of the average standardized indices of Rule of Law and Voice and Accountability from the World Development Indicators. ψ is measured as the negative of the average share of respondents answering affirmatively that they would participate in a demonstration from the World Values Survey. p is measured as the average share of respondents answering affirmatively that they participate in one of the following activities: a group sport, a labor union, or an arts, environmental, professional, charitable, consumer, or other type of organization from the World Values Survey. Standard errors (in parentheses) are robust to arbitrary heteroskedasticity and clustered at the country level.

In Table 1 we report the results from a series of cross-country regressions using our measures of p, τ, and ψ. Our data sources allowed us to compute these measures for several years, so all the results we discuss here include year fixed effects. Unsurprisingly, participation in groups, institutional quality measures, and civic engagement are all strongly correlated with the level of income, so we further control flexibly for this variable with a third-degree polynomial on log income per capita. In the equilibrium of our model, τ is proportional to ψ. Column 1 in the table reproduces the slope of this relationship. We estimate a highly statistically significant slope of 0.03. After flexibly controlling for income in column 2, the slope shrinks to 0.01, but it remains highly statistically significant (with a t-statistic above 3). The inclusion of the polynomial on income per capita raises the R squared from 0.35 to 0.7. We illustrate this relationship graphically in the bottom-left panel of Figure 7. Controlling for income differences, countries with citizens who report being less willing to participate in collective action also are classified as having worse civil liberties protections.

Columns 3-6 then focus on our measure of socialization. In columns 3 and 4 we estimate a negative and statistically significant cross-country relationship between p and τ. Its slope (-2.2) and significance are barely

[47] See Alesina and LaFerrara (2000), who use responses to similar questions from the General Social Survey to study the relationship between group participation and racial heterogeneity in the US.

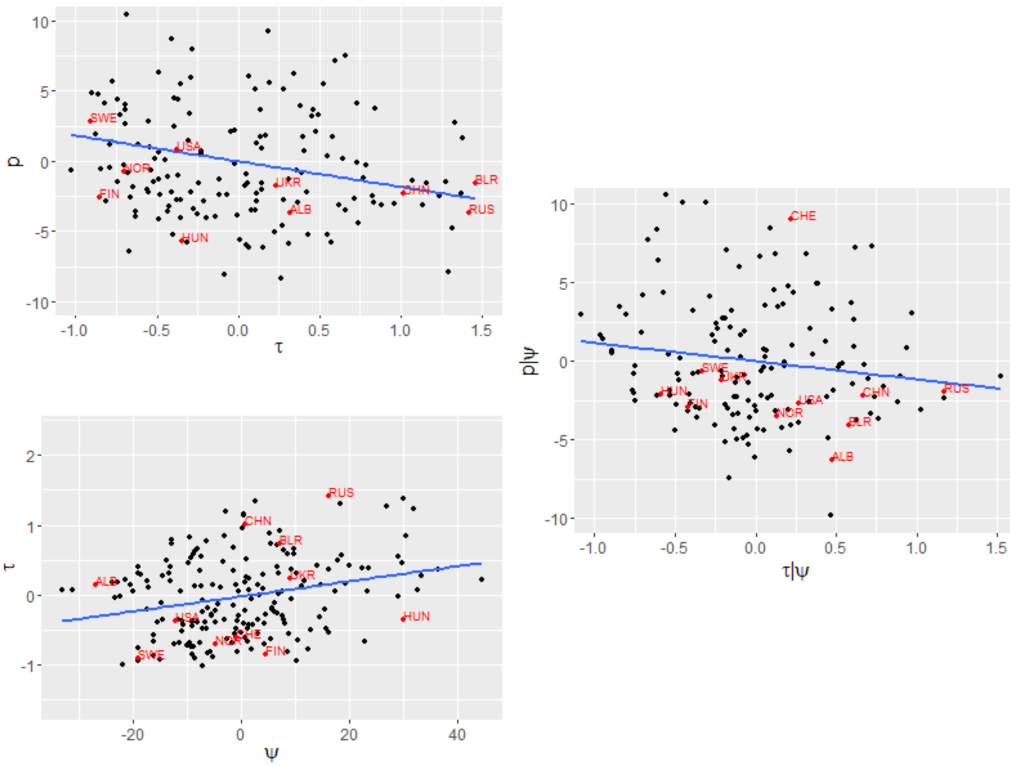

Figure 7: Cross-country relationships between p, τ, and ψ. The figure presents cross-country scatterplots of the following residualized bivariate relationships: In the top-left panel, $p(\tau)$ from column (4) in Table 1. In the bottom-left panel, $\tau(\psi)$ from column (2) in Table 1. In the right panel, $p(\tau|\psi)$ from column (6) in Table 1. The blue line is the correponding slope of the regression line. The figures label a subset of countries.

altered when controlling for income in column 4. We present the scatterplot corresponding to this regression in the top-left panel of Figure 7. The equilibrium of our model also predicts no relationship between p and τ conditional on ψ. Thus, in columns 5 and 6 we additionally include our measure of ψ in the regression model. The slope on τ falls to half its magnitude from columns 3 and 4, and is no longer statistically significant (t-statistic of 1.6 in column 6). In contrast, the coefficient on ψ is highly statistically significant (-0.09 with an associated t-statistic of 3). Its magnitude barely changes from columns 5 to 6 when additionally controlling for income. The right panel of Figure 7 illustrates the lack of a statistically significant relationship between our measures of p and τ conditional on ψ. Controlling for income differences, countries with citizens who report being more willing to participate in collective action also report more engagement in socialization activities. Controlling for differences in civic engagement, differences in the strength of civil liberties across countries – which strongly predict collective action participation–, do not correlate with socialization efforts. We find the consistency of these cross-country empirical patterns with the predictions of our model intriguing at the very least, especially as they are robust to controlling for income differences, and we had to rely on highly imperfect measures of the relevant variables.

B Appendix For Online Publication

B.1 Proofs

B.1.1 Proof of Lemma 1

Citizen i is arrested in the event that her posterior $\chi_i > \underline{\chi}$, and signal $\theta_i = 1$ is realized. Thus, the expected payoff to citizen i is

$$\begin{aligned}
\mathbb{E}_{\rho_i,\underline{\chi}}[u_i] &= \mathbb{E}_{\rho_i,\underline{\chi}}\left[\sqrt{d_i} - \mathbb{1}[\chi_i > \underline{\chi}](\chi\sigma_1(s_i) + (1-\chi)\sigma_0(s_i))\kappa\right] \\
&= \mathbb{E}_{\rho_i}\left[\sqrt{\rho_i p} - \frac{\chi_i - \underline{\chi}_L}{\underline{\chi}_H - \underline{\chi}_L}(\chi\sigma_1(s_i) + (1-\chi)\sigma_0(s_i))\kappa\right] \\
&= \mathbb{E}_{\rho_i}\left[\sqrt{\rho_i p} - \frac{\left(\chi(1-\underline{\chi}_L)a_1 - \underline{\chi}_L(1-\chi)a_0\right) + \left(\chi(1-\underline{\chi}_L)b_1 + \underline{\chi}_L(1-\chi)b_0\right)\rho_i p t}{\underline{\chi}_H - \underline{\chi}_L}\kappa\right] \\
&\propto \mathbb{E}_{\rho_i}\left[\sqrt{\rho_i p} - \frac{\chi(1-\underline{\chi}_L)b_1 + \underline{\chi}_L(1-\chi)b_0}{\underline{\chi}_H - \underline{\chi}_L}\kappa t p \rho_i\right] \\
&= \mathbb{E}_{\rho_i}\left[\sqrt{\rho_i p} - \frac{t}{2\omega}p\rho_i\right].
\end{aligned}$$

B.1.2 Proof of Proposition 1

Denote by χ_p the posterior belief for a citizen for whom the signal drawn was $\theta_i = 1$. When each citizen socializes at rate p, and the interrogation rate is t, each citizen's signal strength is $s_i = p^2 t$. Thus, the government's interim expected payoff is

$$\begin{aligned}
\mathbb{E}_{\underline{\chi}}[V] &= \mathbb{E}_{\underline{\chi}}[\mathbb{1}[\chi_p > \underline{\chi}](\chi\sigma_1(p^2 t) + (1-\chi)\sigma_0(p^2 t))] \\
&= \frac{\chi(1-\underline{\chi}_L)(a_1 + b_1 p^2 t) - \underline{\chi}_L(1-\chi)(a_0 - b_0 p^2 t)}{\underline{\chi}_H - \underline{\chi}_L} \\
&\propto p^2 t.
\end{aligned}$$

The result now follows trivially from replacing $p_i = p$ in the best reply (8) and solving for p.

B.1.3 Proof of Lemma 2

When citizens socialize at rates $\mathbf{p} = (p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}})$, and the government interrogates at rates $t_{\mathcal{A}}$ and $t_{\mathcal{B}}$, the measure of clues about citizen i from group $g \in \{\mathcal{A}, \mathcal{B}\}$ received by the government is

$$s_g = \sum_{h \in \{\mathcal{A},\mathcal{B}\}} \lambda_h p_{gh} p_{hg} t_h.$$

Denote by χ_g the posterior belief for a citizen of group $g \in \{\mathcal{A}, \mathcal{B}\}$ for whom the signal drawn was $\theta_i = 1$. The government's expected payoff corresponds to the mass of expected arrests:

$$\mathbb{E}_{\underline{\chi}}[V] = \mathbb{E}_{\underline{\chi}}\left[\sum_{g\in\{\mathcal{A},\mathcal{B}\}} \lambda_g \mathbb{1}[\chi_g > \underline{\chi}]\left(\chi\sigma_1(s_g) + (1-\chi)\sigma_0(s_g)\right)\right]$$
$$= \sum_{g\in\{\mathcal{A},\mathcal{B}\}} \lambda_g \frac{\chi_g - \underline{\chi}_L}{\underline{\chi}_H - \underline{\chi}_L}\left(\chi\sigma_1(s_g) + (1-\chi)\sigma_0(s_g)\right)$$
$$= \sum_{g\in\{\mathcal{A},\mathcal{B}\}} \lambda_g \frac{\chi(1-\underline{\chi}_L)(a_1 + b_1 s_g) - \underline{\chi}_L(1-\chi)(a_0 - b_0 s_g)}{\underline{\chi}_H - \underline{\chi}_L}$$
$$\propto \sum_{g\in\{\mathcal{A},\mathcal{B}\}} \lambda_g s_g = \sum_{g\in\{\mathcal{A},\mathcal{B}\}}\sum_{h\in\{\mathcal{A},\mathcal{B}\}} \lambda_h\lambda_g p_{gh} p_{hg} t_h$$
$$= \left(\lambda_{\mathcal{A}}^2 p_{\mathcal{A}\mathcal{A}}^2 + \lambda_{\mathcal{A}}\lambda_{\mathcal{B}} p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}\right) t_{\mathcal{A}} + \left(\lambda_{\mathcal{B}}^2 p_{\mathcal{B}\mathcal{B}}^2 + \lambda_{\mathcal{A}}\lambda_{\mathcal{B}} p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}}\right) t_{\mathcal{B}}.$$

B.1.4 Proof of Proposition 2

Case A: $\tau_{\mathcal{A}} < \tau_{\mathcal{B}}$.

Case A.1: $p_{\mathcal{A}\mathcal{B}} = \underline{\rho}$.

First, $p_{\mathcal{A}\mathcal{B}} = \underline{\rho}$ implies

$$(\omega/\tau_{\mathcal{A}})^2 - p_{\mathcal{A}\mathcal{B}} p_{\mathcal{B}\mathcal{A}} \lambda_{\mathcal{B}} > 0.$$

Together with the best reply of citizens from group $\mathcal{A}$ towards citizens of group $\mathcal{A}$,

$$p_{\mathcal{A}\mathcal{A}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{A}})^2 - \underline{\rho} p_{\mathcal{B}\mathcal{A}}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}}\right\}.$$

Second, the best reply for citizens of group $\mathcal{B}$ towards citizens of group $\mathcal{B}$ similarly implies

$$p_{\mathcal{B}\mathcal{B}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{B}})^2 - \underline{\rho} p_{\mathcal{B}\mathcal{A}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\}.$$

Third, $\tau_{\mathcal{A}} < \tau_{\mathcal{B}}$ implies

$$(\omega/\tau_{\mathcal{A}})^2 - p_{\mathcal{B}\mathcal{B}}^2\lambda_{\mathcal{B}} > (\omega/\tau_{\mathcal{A}})^2 - \frac{(\omega/\tau_{\mathcal{B}})^2 - \underline{\rho} p_{\mathcal{B}\mathcal{A}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\lambda_{\mathcal{B}} > (\omega/\tau_{\mathcal{A}})^2 - (\omega/\tau_{\mathcal{B}})^2 > 0.$$

Then, the best reply for citizens of group $\mathcal{B}$ toward citizens of group $\mathcal{A}$ implies that $p_{\mathcal{B}\mathcal{A}} > \underline{\rho}$. In particular,

$$p_{\mathcal{B}\mathcal{A}} = min\left\{1, \frac{(\omega/\tau_{\mathcal{A}})^2 - p_{\mathcal{B}\mathcal{B}}^2\lambda_{\mathcal{B}}}{\underline{\rho}\lambda_{\mathcal{A}}}\right\} > min\left\{1, \frac{(\omega/\tau_{\mathcal{A}})^2 - (\omega/\tau_{\mathcal{B}})^2}{\underline{\rho}\lambda_{\mathcal{A}}}\right\} = 1$$

since $\underline{\rho}$ is arbitrarily small. Collecting these results,

$$p_{\mathcal{A}\mathcal{A}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{A}})^2 - \underline{\rho}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}}\right\}, \quad p_{\mathcal{A}\mathcal{B}} = \underline{\rho}, \quad p_{\mathcal{B}\mathcal{A}} = 1, \quad p_{\mathcal{B}\mathcal{B}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{B}})^2 - \underline{\rho}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\}.$$

These necessary conditions are also sufficient if they satisfy the best replies in (14). This entails making sure the best reply for citizens of group $\mathcal{A}$ towards citizens of group $\mathcal{B}$ holds, which becomes

$$\begin{aligned}(\omega/\tau_{\mathcal{B}})^2 &< p_{\mathcal{AA}}^2\lambda_{\mathcal{A}} + \underline{\rho}p_{\mathcal{BA}}\lambda_{\mathcal{B}} \\ &= min\left\{1, \frac{(\omega/\tau_{\mathcal{A}})^2 - \underline{\rho}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}\right\}\lambda_{\mathcal{A}} + \underline{\rho}\lambda_{\mathcal{B}} \\ &= min\left\{\lambda_{\mathcal{A}} + \underline{\rho}\lambda_{\mathcal{B}}, (\omega/\tau_{\mathcal{A}})^2\right\}.\end{aligned}$$

Case A.2: $p_{\mathcal{BA}} = \underline{\rho}$.

Following a similar argument to the first and second points from Case A.1, we have that

$$p_{\mathcal{AA}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{A}})^2 - \underline{\rho}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}}\right\} \quad \text{and} \quad p_{\mathcal{BB}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{B}})^2 - \underline{\rho}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\}.$$

Then, the best reply of citizens from group $\mathcal{B}$ toward citizens of group $\mathcal{A}$ implies

$$(\omega/\tau_{\mathcal{A}})^2 \leq \underline{\rho}p_{\mathcal{AB}}\lambda_{\mathcal{A}} + p_{\mathcal{BB}}^2\lambda_{\mathcal{B}} = \underline{\rho}p_{\mathcal{AB}}\lambda_{\mathcal{A}} + min\left\{1, \frac{(\omega/\tau_{\mathcal{B}})^2 - \underline{\rho}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}\lambda_{\mathcal{B}} \leq \underline{\rho}p_{\mathcal{AB}}\lambda_{\mathcal{A}} + (\omega/\tau_{\mathcal{B}})^2 - \underline{\rho}\lambda_{\mathcal{A}}$$

which is a contradiction for small $\underline{\rho}$ because $\tau_{\mathcal{A}} < \tau_{\mathcal{B}}$. Thus, this case is not possible.

Case A.3: $p_{\mathcal{AB}}, p_{\mathcal{BA}} \neq \underline{\rho}$.

Since $p_{\mathcal{AB}} \neq \underline{\rho}$, the best reply for citizens from group $\mathcal{A}$ towards citizens from group $\mathcal{B}$ implies

$$p_{\mathcal{AB}} = min\left\{1, \frac{(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}}{p_{\mathcal{BA}}\lambda_{\mathcal{B}}}\right\},$$

which implies

$$\frac{(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}}{p_{\mathcal{BA}}\lambda_{\mathcal{B}}} \geq p_{\mathcal{AB}}.$$

Then,

$$(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{B}} \geq p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}.$$

Since $\tau_{\mathcal{A}} < \tau_{\mathcal{B}}$, this implies

$$(\omega/\tau_{\mathcal{A}})^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{B}} > p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}.$$

Thus, the best reply for citizens from group $\mathcal{A}$ towards citizens from group $\mathcal{A}$ implies $p_{\mathcal{AA}} = 1$.

Case A.3.1: $p_{\mathcal{BB}} \neq \underline{\rho}$.

The best reply for citizens from group $\mathcal{B}$ towards citizens from group $\mathcal{B}$ implies that

$$p_{\mathcal{BB}} = min\left\{1, \frac{(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}}{p_{\mathcal{BB}}\lambda_{\mathcal{B}}}\right\},$$

which in turn implies

$$\frac{(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}}{p_{\mathcal{BB}}\lambda_{\mathcal{B}}} \geq p_{\mathcal{BB}}.$$

Then,

$$(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{BB}}^2\lambda_{\mathcal{B}} \geq p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}.$$

Because $\tau_{\mathcal{A}} < \tau_{\mathcal{B}}$, we obtain

$$(\omega/\tau_{\mathcal{A}})^2 - p_{\mathcal{BB}}^2\lambda_{\mathcal{B}} > p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}.$$

Then, the best reply for citizens of group $\mathcal{B}$ towards citizens of group $\mathcal{A}$ implies $p_{\mathcal{AB}} = 1$. Collecting these results,

$$p_{\mathcal{AA}} = 1, \qquad p_{\mathcal{AB}} = min\left\{1, \frac{(\omega/\tau_{\mathcal{B}})^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}, \qquad p_{\mathcal{BA}} = 1,$$

$$p_{\mathcal{BB}} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{AB}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\} = min\left\{1, \sqrt{\frac{(\omega/\tau_{\mathcal{B}})^2 - min\left\{1, \frac{(\omega/\tau_{\mathcal{B}})^2-\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\}.$$

The necessary conditions are also sufficient if they satisfy the four best replies in (14). This boils down tp making sure the best reply for citizens of group $\mathcal{A}$ towards citizens of group $\mathcal{B}$ holds, which becomes

$$(\omega/\tau_{\mathcal{B}})^2 > \underline{\rho}\lambda_{\mathcal{B}} + \lambda_{\mathcal{A}}.$$

Case A.3.2: $p_{\mathcal{BB}} = \underline{\rho}$.

If $p_{\mathcal{BB}} = \underline{\rho}$, then the best reply from citizens from group $\mathcal{B}$ towards citizens from group $\mathcal{B}$ implies

$$(\omega/\tau_{\mathcal{B}})^2 - p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{A}} \leq \underline{\rho}^2\lambda_{\mathcal{B}}$$

Since $p_{\mathcal{AB}} \neq \underline{\rho}$, the best reply for citizens from group $\mathcal{A}$ towards citizens from group $\mathcal{B}$ implies

$$(\omega/\tau_{\mathcal{B}})^2 - \lambda_{\mathcal{A}} > \underline{\rho}p_{\mathcal{BA}}\lambda_{\mathcal{B}}$$

Then,

$$p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{A}} + \underline{\rho}^2\lambda_{\mathcal{B}} > \lambda_{\mathcal{A}} + \underline{\rho}p_{\mathcal{AB}}\lambda_{\mathcal{B}},$$

which is a contradiction. This case is thus not possible.

Case B: $\tau_{\mathcal{A}} > \tau_{\mathcal{B}}$.

Just switch the labels for $\mathcal{A}$ and $\mathcal{B}$ from Case A.

Case C: $\tau_{\mathcal{A}} = \tau_{\mathcal{B}}$.

Let the common interrogation rate be τ. Clearly, any solution $p_{gh} \in [\underline{\rho}, 1]$ to

$$\lambda_{\mathcal{A}}p_{\mathcal{AA}}^2 + \lambda_{\mathcal{B}}p_{\mathcal{AB}}p_{\mathcal{BA}} = (\omega/\tau)^2 = \lambda_{\mathcal{B}}p_{\mathcal{BB}}^2 + \lambda_{\mathcal{A}}p_{\mathcal{AB}}p_{\mathcal{BA}}$$

solves the problem. There is a continuum of payoff-equivalent equilibria. We can select the symmetric equilibrium $p_{gh} = [\![\frac{\omega}{\tau}]\!]$. For completeness, notice that for any $p_{\mathcal{AB}}, p_{\mathcal{BA}} \in [\underline{\rho}, 1]$ such that

$$p_{\mathcal{AB}}p_{\mathcal{BA}} \in \left[\frac{(\omega/\tau)^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}, \frac{(\omega/\tau)^2 - \underline{\rho}^2\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right] \cap \left[\frac{(\omega/\tau)^2 - \lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}, \frac{(\omega/\tau)^2 - \underline{\rho}^2\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}\right],$$

the following solves the problem:

$$p_{\mathcal{AA}} = \sqrt{\frac{(\omega/\tau)^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}}, \qquad p_{\mathcal{BB}} = \sqrt{\frac{(\omega/\tau)^2 - p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}.$$

B.1.5 Proof of Theorem 1

Because citizens are infinitesimal, the partial equilibrium results from proposition 2 give us the government's payoff from a given interrogations vector against a given socialization rates vector, citizens' payoffs from a given mutually consistent socialization rates vector against a given interrogations rate vector, and citizens best replies. Because the government can always choose $(\tau_{\mathcal{A}}, \tau_{\mathcal{B}})$ and avoid contagion, we can proceed by comparing the three candidate solutions to the government's problem:

1. Equal treatment: $\tau_{\mathcal{A}} = \tau_{\mathcal{B}} = \psi$;

2. Unequal treatment against group $\mathcal{A}$: $\tau_{\mathcal{A}} = 1, \tau_{\mathcal{B}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p_{\mathcal{BB}}^2}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}$.

3. Unequal treatment against group $\mathcal{B}$: $\tau_{\mathcal{B}} = 1, \tau_{\mathcal{A}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p_{\mathcal{AA}}^2}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}$;

Henceforth we will refer to these as options 1, 2, and 3, and will write $t_{\mathcal{A}i}, t_{\mathcal{B}i}, i = 1, 2, 3$ as the corresponding interrogation rates. Consider unequal treatment on group $\mathcal{B}$, option 3. This is, $\tau_{\mathcal{B}} = 1$ and $\tau_{\mathcal{A}} = \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p_{\mathcal{AA}}^2}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}} < 1$.

Case A: $\omega < \sqrt{\lambda_{\mathcal{A}}}$.

Then,

$$(p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}}) \simeq \left(\min\left\{1, \frac{\omega}{t_{\mathcal{A}}\sqrt{\lambda_{\mathcal{A}}}}\right\}, \underline{\rho}, 1, \min\left\{1, \frac{\omega}{t_{\mathcal{B}}\sqrt{\lambda_{\mathcal{B}}}}\right\}\right)$$

and

$$t_{\mathcal{A}} = \psi - (1-\psi)\frac{\underline{\rho}\lambda_{\mathcal{B}}}{\min\{\lambda_{\mathcal{A}}, (\omega^2/t_{\mathcal{A}})\}} \simeq \psi.$$

Thus, we can now compare

$$(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}})t_{\mathcal{A}i} + (p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}})t_{\mathcal{B}i}$$

and show it is maximized at $i = 3$:

$$\begin{aligned}
\Delta_{32} \equiv \widetilde{V}_3 - \widetilde{V}_2 &= (t_{\mathcal{A}3} - t_{\mathcal{A}2})(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) + (t_{\mathcal{B}3} - t_{\mathcal{B}2})(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&\propto (p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) - (p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&\quad - \underline{\rho}\left(\frac{1}{p_{\mathcal{AA}}^2}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) - \frac{1}{p_{\mathcal{BB}}^2}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}p_{\mathcal{BA}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}})\right) \\
&= (p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 - p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2)\left(1 - \frac{\underline{\rho}^2}{p_{\mathcal{AA}}^2 p_{\mathcal{BB}}^2}\right) \\
&\propto \min\left\{\lambda_{\mathcal{B}}, \omega^2 - \underline{\rho}\lambda_{\mathcal{A}}\right\}\lambda_{\mathcal{B}} - \min\left\{\lambda_{\mathcal{A}}, \frac{\omega^2}{\psi^2} - \underline{\rho}\lambda_{\mathcal{B}}\right\}\lambda_{\mathcal{A}} \\
&\simeq \min\left\{\lambda_{\mathcal{B}}, \omega^2\right\}\lambda_{\mathcal{B}} - \min\left\{\lambda_{\mathcal{A}}, \frac{\omega^2}{\psi^2}\right\}\lambda_{\mathcal{A}} \equiv \widetilde{\Delta}_{32}.
\end{aligned}$$

Note that $\Delta_{32} = 0$ or $\widetilde{\Delta}_{32} = 0$ is strongly non-generic. For any one of the parameters $\lambda_{\mathcal{A}}$ and ω^2, $\Delta_{32} = 0$ or $\widetilde{\Delta}_{32} = 0$ is non-generic keeping the remaining parameters fixed at any value. So we focus on the case of $\Delta_{32} \neq 0$ and $\widetilde{\Delta}_{32} \neq 0$. Then, for small $\underline{\rho}$, the signs of Δ_{32} and $\widetilde{\Delta}_{32}$ are the same. Thus, generically, if $\widetilde{\Delta}_{32} > 0$ then the best option for the government is $i = 3$, and if $\widetilde{\Delta}_{32} < 0$ then the best option for the government is $i = 2$. Without loss of generality, we focus on the generic case where $\omega^2 \neq \lambda_{\mathcal{B}} \neq \lambda_{\mathcal{A}}\psi^2 \neq \omega^2$.

Case A.1: $\omega^2 < \lambda_{\mathcal{B}}, \lambda_{\mathcal{A}}\psi^2, \lambda_{\mathcal{A}}$.

In this case, the condition amounts to $\omega^2\lambda_{\mathcal{B}} > \frac{\omega^2}{\psi^2}\lambda_{\mathcal{A}} \iff \psi^2\lambda_{\mathcal{B}} > \lambda_{\mathcal{A}}$. Thus, option $i = 3$ is preferred by the government if

$$\lambda_{\mathcal{A}} < \psi^2\lambda_{\mathcal{B}} \quad \text{and} \quad \omega^2 < \lambda_{\mathcal{A}}\psi^2.$$

Case A.2: $\lambda_{\mathcal{B}} < \omega^2 < \lambda_{\mathcal{A}}\psi^2, \lambda_{\mathcal{A}}$.

In this case, the condition amounts to $\lambda_{\mathcal{B}}^2 > \frac{\omega^2}{\psi^2}\lambda_{\mathcal{A}} \iff \omega^2 < \frac{\lambda_{\mathcal{B}}^2\psi^2}{\lambda_{\mathcal{A}}}$. But this implies $\lambda_{\mathcal{B}} < \omega^2 < \frac{\lambda_{\mathcal{B}}^2\psi^2}{\lambda_{\mathcal{A}}}$ and $\lambda_{\mathcal{B}} < \lambda_{\mathcal{A}}\psi^2$, which implies $\psi > 1$, a contradiction.

Case A.3: $\lambda_{\mathcal{A}}\psi^2 < \omega^2 < \lambda_{\mathcal{B}}$

In this case, the condition amounts to $\omega^2\lambda_{\mathcal{B}} > \lambda_{\mathcal{A}}^2$. Thus, option $i = 3$ is best if

$$\max\left\{\frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}}, \psi^2\lambda_{\mathcal{A}}\right\} < \omega^2 < \lambda_{\mathcal{A}}.$$

Case A.4: $\lambda_{\mathcal{B}}, \lambda_{\mathcal{A}}\psi^2 < \omega^2 < \lambda_{\mathcal{A}}$**.**

In this case, the condition amounts to $\lambda_{\mathcal{B}} > \lambda_{\mathcal{A}}$, which is a contradiction.

Combining cases A.1 to A.4, there is unequal treatment against group $\mathcal{B}$ under $\omega^2 < \lambda_{\mathcal{A}}$ if and only if

$$\omega^2 < \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}}\psi^2 \quad \text{or} \quad \lambda_{\mathcal{A}}\psi^2 < \frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}} < \omega^2 < \lambda_{\mathcal{A}},$$

with corresponding equilibrium interrogation rates

$$(\tau_{\mathcal{A}}^*, \tau_{\mathcal{B}}^*) \simeq (\psi, 1)$$

and equilibrium socialization rates

$$(p_{\mathcal{AA}}^*, p_{\mathcal{AB}}^*, p_{\mathcal{BA}}^*, p_{\mathcal{BB}}^*) \simeq \left(min\left\{1, \frac{\omega}{\psi\sqrt{\lambda_{\mathcal{A}}}}\right\}, 0, 1, min\left\{1, \frac{\omega}{\sqrt{\lambda_{\mathcal{B}}}}\right\}\right).$$

Notice this is a strict equilibrium.

Case B: $\omega > \sqrt{\lambda_{\mathcal{A}}}$**.**

Then,

$$(p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}}) \simeq \left(1, \min\left\{1, \frac{(\omega/t_{\mathcal{B}})^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}, 1, \min\left\{1, \sqrt{\frac{(\omega/t_{\mathcal{B}})^2 - p_{\mathcal{AB}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}}\right\}\right)$$

and

$$t_{\mathcal{A}} = \psi - (1-\psi)p_{\mathcal{AB}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}.$$

Recall this expression must be non-negative, or a riot will be triggered. Thus, we must have

$$\psi - (1-\psi)p_{\mathcal{AB}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}} \geq 0 \Longleftrightarrow \frac{\lambda_{\mathcal{A}}}{1-\psi} \geq \min\left\{1, \omega^2\right\} \tag{B.1}$$

Without loss of generality we focus on the generic case $1 \neq \frac{\lambda_{\mathcal{A}}}{1-\psi} \neq \omega^2 \neq 1$. We begin comparing the government's payoff under options $i = 1$ and $i = 3$:

$$\begin{aligned}
\Delta_{13} \equiv \widetilde{V}_3 - \widetilde{V}_1 &= (t_{\mathcal{A}3} - t_{\mathcal{A}1})(\lambda^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) + (t_{\mathcal{B}3} - t_{\mathcal{B}1})(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&= -(1-\psi)p_{\mathcal{AB}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}(\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) + (1-\psi)(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&\propto -p_{\mathcal{AB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 \\
&\propto p_{\mathcal{BB}}^2 - p_{\mathcal{AB}}^2.
\end{aligned}$$

Notice that $p_{\mathcal{AB}} = 1$ iff $\omega^2 > 1$. In this case, $p_{\mathcal{BB}} = 1$. Also, if $p_{\mathcal{AB}} < 1$, then $p_{\mathcal{AB}} < p_{\mathcal{BB}}$. This is, $p_{\mathcal{AB}} \leq p_{\mathcal{BB}}$ and $p_{\mathcal{AB}} = p_{\mathcal{BB}}$ iff

$$\omega^2 > 1 \quad \text{and} \quad p_{\mathcal{AB}} = p_{\mathcal{BA}} = 1.$$

Thus, the government prefers option $i = 3$ to option $i = 1$. It is weakly preferred if $\omega^2 > 1$, and strictly preferred if $\omega^2 < 1$.

We can now compare the government's payoff under options $i = 2$ and $i = 3$:

$$\begin{aligned}
\Delta_{23} &= (t_{\mathcal{A}3} - t_{\mathcal{A}2})(\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) + (t_{\mathcal{B}3} - t_{\mathcal{B}2})(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&\propto -\left(1 + p_{\mathcal{AB}}\frac{\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}\right)(\lambda_{\mathcal{A}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) + \left(1 + \frac{p_{\mathcal{AB}}}{p_{\mathcal{BB}}^2}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right)(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{AB}}\lambda_{\mathcal{A}}\lambda_{\mathcal{B}}) \\
&= -\lambda_{\mathcal{A}}^2 - p_{\mathcal{AB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + \frac{p_{\mathcal{AB}}^2}{p_{\mathcal{BB}}^2}\lambda_{\mathcal{A}}^2 \\
&= (p_{\mathcal{BB}}^2 - p_{\mathcal{AB}}^2)\left(\lambda_{\mathcal{B}}^2 - \frac{\lambda_{\mathcal{A}}^2}{p_{\mathcal{BB}}^2}\right).
\end{aligned}$$

We have already established that if $\omega^2 < 1$, then $p_{\mathcal{BB}} > p_{\mathcal{AB}}$. Thus, under $\lambda_{\mathcal{A}} < \omega^2 < 1$, option $i = 3$ is better than option $i = 1$ iff

$$\begin{aligned}
0 \le p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 - \lambda_{\mathcal{A}}^2 &= \min\left\{1, \frac{\omega^2 - p_{\mathcal{AB}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}\lambda_{\mathcal{B}}^2 - \lambda_{\mathcal{A}}^2 \\
&= \min\left\{1, \frac{\omega^2 - \frac{\omega^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\}\lambda_{\mathcal{B}}^2 - \lambda_{\mathcal{A}}^2 \\
&= \min\left\{\lambda_{\mathcal{B}} - \lambda_{\mathcal{A}}, \omega^2(\lambda_{\mathcal{B}} - \lambda_{\mathcal{A}})\right\} \\
\iff \lambda_{\mathcal{A}} \le \lambda_{\mathcal{B}}.
\end{aligned}$$

Since $\lambda_{\mathcal{A}} \neq \lambda_{\mathcal{B}}$, option $i = 3$ is better for the government iff $\lambda_{\mathcal{A}} < \lambda_{\mathcal{B}}$, and it is strictly better in this case. Combining this with (B.1), there is an unequal treatment equilibrium against $\mathcal{B}$ under $\lambda_{\mathcal{A}} < \omega^2 < 1$ iff

$$\lambda_{\mathcal{A}} < \omega^2 < \min\left\{1, \frac{\lambda_{\mathcal{A}}}{1 - \psi}\right\} \quad \text{and} \quad \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}},$$

with corresponding equilibrium interrogation rates

$$(\tau_{\mathcal{A}}^*, \tau_{\mathcal{B}}^*) \simeq \left(\psi - (1 - \psi)\frac{\omega^2 - \lambda_{\mathcal{A}}}{\lambda_{\mathcal{A}}}, 1\right)$$

and equilibrium socialization rates

$$(p_{\mathcal{AA}}^*, p_{\mathcal{AB}}^*, p_{\mathcal{BA}}^*, p_{\mathcal{BB}}^*) \simeq \left(1, \frac{\omega^2 - \lambda_{\mathcal{A}}}{\lambda_B}, 1, \frac{\sqrt{\omega^2(\lambda_{\mathcal{B}} - \lambda_{\mathcal{A}}) + \lambda_{\mathcal{A}}^2}}{\lambda_{\mathcal{B}}}\right).$$

Notice this is a strict equilibrium.

B.1.6 Proof of Proposition 3

We begin by comparing the government's ex-ante payoffs under an ETE and under an UTE1. Fix an economy $(\psi, \omega, \lambda_{\mathcal{A}})$ such that an UTE1 exists. Thus,

$$\omega^2 < \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}}\psi^2 \quad \text{or} \quad \lambda_{\mathcal{A}}\psi^2 < \frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}} < \omega^2 < \lambda_{\mathcal{A}}.$$

Case UTE1-A: $\omega^2 < \psi^2\lambda_{\mathcal{A}}$.

In this case,

$$\begin{aligned} V^{UTE1} - V^{ETE} &= \psi \left(\min \left\{ 1, \frac{\omega^2}{\psi^2 \lambda_{\mathcal{A}}} \right\} \lambda_{\mathcal{A}}^2 \right) + \omega^2 \lambda_{\mathcal{B}} - \min \left\{ 1, \frac{\omega^2}{\psi^2} \right\} \psi \\ &= \frac{1}{\psi} \omega^2 \lambda_{\mathcal{A}} + \omega^2 \lambda_{\mathcal{B}} - \frac{\omega^2}{\psi} < 0. \end{aligned}$$

The government is worse off under the UTE1 than under the corresponding ETE.

Case UTE1-B: $\psi^2 \lambda_{\mathcal{A}} < \omega^2 < \psi^2$.

Notice that $\lambda_{\mathcal{A}} \psi^2 < \frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}} < \omega^2 < \lambda_{\mathcal{A}}$ implies $\frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}} < \psi^2$. This implies in turn that $\lambda_{\mathcal{A}} < \psi \sqrt{\lambda_{\mathcal{B}}} < \psi^2 \lambda_{\mathcal{B}}$, and consequently, that $\psi^2 \lambda_{\mathcal{A}} > \frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}}$, which is a contradiction. Thus, we must be in the case $\omega^2 < \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}} \psi^2$, which implies $\psi^2 \lambda_{\mathcal{A}} < \omega^2 < \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}} \psi^2$. In this case,

$$\begin{aligned} V^{UTE1} - V^{ETE} &= \psi \left(\min \left\{ 1, \frac{\omega^2}{\psi^2 \lambda_{\mathcal{A}}} \right\} \lambda_{\mathcal{A}}^2 \right) + \omega^2 \lambda_{\mathcal{B}} - \min \left\{ 1, \frac{\omega^2}{\psi^2} \right\} \\ &= \psi \lambda_{\mathcal{A}}^2 + \omega^2 \lambda_{\mathcal{B}} - \omega^2 \frac{1}{\psi} \\ &< \psi \lambda_{\mathcal{A}}^2 - \psi^2 \lambda_{\mathcal{A}} \left(\frac{1}{\psi} - \lambda_{\mathcal{B}} \right) \\ &= \psi \lambda_{\mathcal{A}} \left(\lambda_{\mathcal{A}} + \psi \lambda_{\mathcal{B}} - 1 \right) < 0. \end{aligned}$$

The government is worse off under the UTE1 than under the corresponding ETE.

Case UTE1-C: $\psi < \omega$.

In this case we cannot have $\omega^2 < \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}} \psi^2$. Instead, it must be that $\psi^2 \lambda_{\mathcal{A}} < \frac{\lambda_{\mathcal{A}}^2}{\lambda_{\mathcal{B}}} < \omega^2 < \lambda_{\mathcal{A}}$, together with $\psi^2 < \omega^2$.

$$\begin{aligned} V^{UTE1} - V^{ETE} &= \psi \left(\min \left\{ 1, \frac{\omega^2}{\psi^2 \lambda_{\mathcal{A}}} \right\} \lambda_{\mathcal{A}}^2 \right) + \omega^2 \lambda_{\mathcal{B}} - \min \left\{ 1, \frac{\omega^2}{\psi^2} \right\} \psi \\ &= \lambda_{\mathcal{B}} (\omega^2 - \psi (1 + \lambda_{\mathcal{A}})). \end{aligned}$$

Note that the government's payoff is higher under the UTE1 iff $\omega^2 > \psi(1+\lambda_{\mathcal{A}})$. Note also that $\psi(1+\lambda_{\mathcal{A}}) > \psi^2$, so $\omega > \psi$ whenever $\omega^2 > \psi(1+\lambda_{\mathcal{A}})$ holds. Thus, in this case ETE entails $p_{gh} = 1$ for all $g, h \in \{\mathcal{A}, \mathcal{B}\}$.

Now we compare the government's ex-ante payoffs under an ETE and under an UTE2. Fix an economy $(\psi, \omega, \lambda_{\mathcal{A}})$ such that an UTE2 exists. Thus,

$$\lambda_{\mathcal{A}} < \omega^2 < \min \left\{ 1, \frac{\lambda_{\mathcal{A}}}{1 - \psi} \right\} \quad and \quad \lambda_{\mathcal{A}} < \lambda_{\mathcal{B}}.$$

Case UTE2-A: $\omega < \psi$.

In this case,

$$\begin{aligned} V^{UTE2} - V^{ETE} &= \left(\omega^2 - (1 - \psi) \omega^4 \right) - \min \left\{ 1, \frac{\omega^2}{\psi^2} \right\} \psi \\ &= \omega^2 - (1 - \psi) \omega^4 - \frac{\omega^2}{\psi} < 0. \end{aligned}$$

The government is worse off under the UTE2 than under the corresponding ETE.

Case UTE2-B: $\omega > \psi$.

In this case,

$$\begin{aligned}V^{UTE2} - V^{ETE} &= \left(\omega^2 - (1-\psi)\omega^4\right) - \min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi \\ &= \omega^2 - (1-\psi)\omega^4 - \psi \\ &= \left(1-\omega^2\right)\left(\omega^2(1-\psi) - \psi\right).\end{aligned}$$

Note that the government's payoff is higher under the UTE2 iff $\omega^2 > \frac{\psi}{1-\psi}$. Note also that $\psi^2 < \frac{\psi}{1-\psi}$, so when $\omega > \psi$ whenever $\omega^2 > \frac{\psi}{1-\psi}$ holds. Thus, in this case ETE entails $p_{gh} = 1$ for all $g, h \in \{\mathcal{A}, \mathcal{B}\}$.

B.1.7 Proof of Lemma 4

We consider the same cases as those from the proof of Proposition 3 above.

Case UTE1-A: $\omega^2 < \psi^2 \lambda_{\mathcal{A}}$.
Consider first the payoffs for citizens from group $\mathcal{A}$. In this case,

$$\begin{aligned}u^{A,UTE1} - u^{A,ETE} &= \left(\sqrt{\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A\psi\right) - \left(\min\left\{1, \frac{\omega}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\ &= \left(\sqrt{\frac{\omega^2}{\psi^2}} - \frac{1}{2\omega}\frac{\omega^2}{\psi}\right) - \left(\frac{\sqrt{\omega^2}}{\psi} - \frac{1}{2\omega}\frac{\omega^2}{\psi}\right) = 0.\end{aligned}$$

Group $\mathcal{A}$ citizens are indifferent between UTE1 and ETE.
Now consider the payoffs for citizens from group $\mathcal{B}$. In this case,

$$\begin{aligned}u^{B,UTE1} - u^{B,ETE} &= \left(\omega - \frac{1}{2\omega}\omega^2\right) - \left(\min\left\{1, \frac{\omega}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\ &= \left(\omega - \frac{1}{2\omega}\omega\right) - \left(\frac{\sqrt{\omega^2}}{\psi} - \frac{1}{2\omega}\frac{\omega^2}{\psi}\right) < 0.\end{aligned}$$

Group $\mathcal{B}$ citizens are worse off under UTE1 than under the corresponding ETE.

Case UTE1-B: $\psi^2\lambda_{\mathcal{A}} < \omega^2 < \psi^2$. Consider first the payoffs for citizens from group $\mathcal{A}$. In this case,

$$\begin{aligned}u^{A,UTE1} - u^{A,ETE} &= \left(\sqrt{\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A\psi\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\ &= -\left(\sqrt{\lambda_A} - \frac{\sqrt{\omega^2}}{\psi}\right)^2 \frac{1}{2}\frac{\psi}{\sqrt{\omega^2}} < 0.\end{aligned}$$

Group $\mathcal{A}$ citizens are worse off under UTE1 than under the corresponding ETE.
Now consider the payoffs for citizens from group $\mathcal{B}$. In this case,

$$\begin{aligned}u^{B,UTE1} - u^{B,ETE} &= \left(\sqrt{\omega^2} - \frac{1}{2\omega}\omega^2\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\ &= \left(\sqrt{\omega^2} - \frac{1}{2\omega}\omega^2\right) - \frac{1}{\psi}\left(\sqrt{\omega^2} - \frac{1}{2\omega}\omega^2\right) < 0.\end{aligned}$$

Group $\mathcal{B}$ citizens are worse off under UTE1 than under the corresponding ETE.

Case UTE1-C: $\psi < \omega$. Consider first the payoffs for citizens from group $\mathcal{A}$. In this case,

$$\begin{aligned}
u^{A,UTE1} - u^{A,ETE} &= \left(\sqrt{\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2\lambda_A}\right\}\lambda_A\psi\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\
&= \left(1 - \sqrt{\lambda_A}\right)\left(\frac{1}{2\sqrt{\omega^2}}\psi\left(1 + \sqrt{\lambda_A}\right) - 1\right) \\
&< \left(1 - \sqrt{\lambda_A}\right)\left(\frac{1}{2}\left(1 + \sqrt{\lambda_A}\right) - 1\right) < 0.
\end{aligned}$$

Group $\mathcal{A}$ citizens are worse off under UTE1 than under the corresponding ETE.

Now consider the payoffs for citizens from group $\mathcal{B}$. In this case,

$$\begin{aligned}
u^{B,UTE1} - u^{B,ETE} &= \left(\sqrt{\omega^2} - \frac{1}{2\omega}\omega^2\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\
&= \frac{\omega}{2} + \frac{\psi}{2\omega} - 1 < \frac{1}{2} + \frac{1}{2} - 1 = 0.
\end{aligned}$$

Group $\mathcal{B}$ citizens are worse off under UTE1 than under the corresponding ETE.

Case UTE2-A: $\omega < \psi$. Consider first the payoffs for citizens from group $\mathcal{A}$. In this case,

$$\begin{aligned}
u^{A,UTE2} - u^{A,ETE} &= \left(\sqrt{\omega^2} - \frac{1}{2\omega}\psi\omega^2\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\
&= \omega\left(1 - \frac{1}{2}\left(\psi + \frac{1}{\psi}\right)\right) \\
&< \omega\left(1 - \frac{1}{2}2\right) = 0.
\end{aligned}$$

Group $\mathcal{A}$ citizens are worse off under UTE2 than under the corresponding ETE.

Now consider the payoffs for citizens from group $\mathcal{B}$. It suffices to note that $u^{B,UTE2} < u^{A,UTE2}$, and $u^{B,ETE} = u^{A,ETE}$. Thus, group $\mathcal{B}$ citizens are worse off under UTE2 than under the corresponding ETE.

Case UTE2-B: $\omega > \psi$. Consider first the payoffs for citizens from group $\mathcal{A}$. In this case,

$$\begin{aligned}
u^{A,UTE2} - u^{A,ETE} &= \left(\sqrt{\omega^2} - \frac{1}{2\omega}\psi\omega^2\right) - \left(\min\left\{1, \frac{\sqrt{\omega^2}}{\psi}\right\} - \frac{1}{2\omega}\min\left\{1, \frac{\omega^2}{\psi^2}\right\}\psi\right) \\
&= (1 - \omega)\left(\frac{\psi}{2}\left(\frac{1 + \omega}{\omega}\right) - 1\right) \\
&< (1 - \omega)\left(\frac{\omega}{2}\left(\frac{1 + \omega}{\omega}\right) - 1\right) = (1 - \omega)\left(\frac{1 + \omega}{2} - 1\right) < 0.
\end{aligned}$$

Group $\mathcal{A}$ citizens are worse off under UTE2 than under the corresponding ETE.

Now consider the payoffs for citizens from group $\mathcal{B}$. It suffices to note that $u^{B,UTE2} < u^{A,UTE2}$, and $u^{B,ETE} = u^{A,ETE}$. Thus, group $\mathcal{B}$ citizens are worse off under UTE2 than under the corresponding ETE.

B.1.8 Proof of Lemma 5

As in the benchmark case, the government's optimal choice conditional on avoiding all contagion is $(\tau_{\mathcal{A}}, \tau_{\mathcal{B}}) = (\psi, \psi)$. Because in the case we are considering $\nu > \psi$, this constitutes a (non-strict) ETE. If instead one of the interrogation rates triggers contagion within group g, a before, it will be optimal for the government to choose

$t_g = 1$. Because $\lambda_{\mathcal{B}} > \nu$, the government cannot choose to trigger contagion on group $\mathcal{B}$ as this would lead to a riot. The only candidate UTE must entail unequal treatment on group $\mathcal{A}$ –the minority–.

Consider $t_{\mathcal{A}} = 1$ and $t_{\mathcal{B}} = \min\left\{\frac{\nu-\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}, \psi - (1-\psi)\frac{p_{\mathcal{AB}}p_{\mathcal{BA}}}{p_{\mathcal{BB}}^2}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\} < 1$. Since unequal treatment against group $\mathcal{B}$ is not optimal, it is sufficient to verify that unequal treatment against group $\mathcal{A}$ is preferred by the government to equal treatment when citizens socialize differentially according to that expectation:

$$(t_{\mathcal{B}} - \psi)(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) + (t_{\mathcal{A}} - \psi)(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) > 0$$

Case UTE1-A: $\omega < \sqrt{\lambda_{\mathcal{B}}}$.

In this case, citizens socialization best responses imply

$$(p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}}) \simeq \left(\min\left\{1, \frac{\omega}{\sqrt{\lambda_{\mathcal{A}}}}\right\}, 1, 0, \min\left\{1, \frac{\omega}{t_{\mathcal{B}}\sqrt{\lambda_{\mathcal{B}}}}\right\}\right)$$

with

$$t_{\mathcal{B}} \simeq \min\left\{\frac{\nu-\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}, \psi\right\} = \psi.$$

Evaluating the inequality above, it is clear that the government prefers unequal treatment against the minority $(1, \psi)$ over equal treatment (ψ, ψ).

Case UTE1-B: $\sqrt{\lambda_{\mathcal{B}}} < \omega < 1$.

In this case, citizens socialization best responses imply

$$(p_{\mathcal{AA}}, p_{\mathcal{AB}}, p_{\mathcal{BA}}, p_{\mathcal{BB}}) \simeq \left(\min\left\{1, \sqrt{\frac{\omega^2 - p_{\mathcal{BA}}\lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}}\right\}, 1, \frac{\omega^2 - \lambda_{\mathcal{B}}}{\lambda_{\mathcal{A}}}, 1\right)$$

with

$$t_{\mathcal{B}} = \min\left\{\frac{\nu-\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}, \psi - (1-\psi)p_{\mathcal{BA}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}\right\} = \psi - (1-\psi)p_{\mathcal{BA}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}.$$

Then,

$$\begin{aligned}
&(t_{\mathcal{B}} - \psi)(p_{\mathcal{BB}}^2\lambda_{\mathcal{B}}^2 + p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) + (t_{\mathcal{A}} - \psi)(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{BA}}p_{\mathcal{AB}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) \\
&= -(1-\psi)p_{\mathcal{BA}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}(\lambda_{\mathcal{B}}^2 + p_{\mathcal{BA}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) + (1-\psi)(p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{BA}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) \\
&\simeq -p_{\mathcal{BA}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}}(\lambda_{\mathcal{B}}^2 + p_{\mathcal{BA}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) + (p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{BA}}\lambda_{\mathcal{B}}\lambda_{\mathcal{A}}) \\
&= -p_{\mathcal{BA}}^2\lambda_{\mathcal{A}}^2 + p_{\mathcal{AA}}^2\lambda_{\mathcal{A}}^2 \\
&\propto p_{\mathcal{AA}}^2 - p_{\mathcal{BA}}^2 > 0.
\end{aligned}$$

The government prefers unequal treatment against the minority $(1, \psi - (1-\psi)p_{\mathcal{BA}}\frac{\lambda_{\mathcal{A}}}{\lambda_{\mathcal{B}}})$ over equal treatment (ψ, ψ).