The Effects of the Right to Silence on the Innocent’s Decision to Remain Silent

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Abstract

This paper shows that innocent suspects benefit from exercising the right to silence in criminal proceedings. We study a model in which a suspect of a crime can make a statement or remain silent during police interrogation. We assume the evidence at trial is more likely to contradict the suspect’s police statement if the suspect is guilty than if he is innocent. We further assume that the evidence at trial is more likely to directly implicate in the crime a guilty suspect than an innocent suspect. We show that a right to silence benefits innocent suspects by providing them with a safer alternative to speech, as well as by reducing the probability of conviction of innocent suspects who remain silent whether or not a right to silence exists. The paper thus provides a broad utilitarian justification for the argument that the right to silence helps the innocent.

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“... the privilege [against self-incrimination], while sometimes a ‘shelter to the guilty,’ is often ‘a protection to the innocent.’”

*Murphy v. Waterfront Com’n of New York Harbor* (1964, p. 55)

1. Introduction

The Fifth Amendment’s privilege against compelled self-incrimination provides criminal suspects with a right to silence. The right to silence prohibits a jury from drawing an adverse inference from a suspect’s decision to remain silent in the face of questioning. In particular, if a suspect of a crime refuses to answer police questions, the jury must not consider the suspect’s silence as evidence of guilt. Rather, the jury must reach its verdict based only on the other evidence presented at trial. The right to silence is often described as one of the fundamental principles of criminal proceedings. Thus, the Supreme Court in *Miranda v. Arizona* (1966, p. 466) portrayed the right to silence as “the essential mainstay of our adversarial system.”

Notwithstanding the Supreme Court’s endorsement of the right to silence, it is constantly debated among policy makers and academics (see. e.g., Coldrey, 1991; Greer, 1990). Advocates of the right to silence concede that it may help the guilty to avoid conviction, but argue that it protects other values such as personal dignity, free will, and deterrence of government coercion (Gerstein, 1970). Detractors of the right to silence maintain that it impedes the search for truth with no benefit to the innocent. Thus, as early as the beginning of the eighteenth century, the philosopher Jeremy Bentham wrote in the context of silence at trial: “Innocence claims the right of speaking, as guilt invokes the privilege of silence.” (Bentham, 1825; p. 241). In a similar vein, Justice Henry Friendly argued that no proof of protection of the innocent has been offered and that “on balance the privilege so much more often shelters the guilty and even harms the innocent that ... its occasional effect in protection of the innocent would be an altogether insufficient reason.” (Friendly, 1968; p. 686).

In this paper, we examine the effects of a right to silence on suspects’ decisions to speak or to remain silent during police interrogations. We show that, contrary to Bentham’s factual assertion, a right to silence helps the innocent by providing them a refuge against self-incrimination. We also show that a right to silence benefits innocent suspects even if they would have chosen to remain silent in the absence of a right to silence. Specifically, we show that the probability of an innocent suspect who remains silent being wrongfully convicted is lower if suspects have a right to silence.

To evaluate the effects of a right to silence on the decision to speak or to remain silent, we consider the following stylized model. A suspect is arrested for committing a crime. The suspect is either innocent or guilty. The suspect, but not the police or the jury, knows whether or not he committed the crime. The suspect is taken in for police interrogation, where he can make a statement (i.e., “speak”), remain silent, or confess the crime.

If the suspect does not confess the crime, the case goes to trial. At trial, circumstantial evidence is presented to a jury. The circumstantial evidence either corroborates or...
contradicts the suspect’s police statement. The circumstantial evidence, however, is not fully accurate. In particular, the circumstantial evidence may contradict the suspect’s statement even if the suspect is innocent and may corroborate the suspect’s statement even if the suspect is guilty. This implies that innocent and guilty suspects alike face a dilemma of whether to speak or remain silent, because the circumstantial evidence may contradict both innocent and guilty suspects’ statements. We assume, however, the probability that the circumstantial evidence contradicts the suspect’s statement is higher if the suspect is guilty.

Apart from the circumstantial evidence, the evidence presented at trial may directly implicate the suspect in the crime. For example, direct evidence may include witness testimony or physical object that suggests the suspect committed the crime. The direct evidence is also not entirely accurate. In particular, the direct evidence may incriminate the suspect even if the suspect is innocent, and may fail to incriminate the suspect even if the suspect is guilty. We assume, however, that the direct evidence is more likely to incriminate the suspect if the suspect is guilty than if he is innocent.

In reaching its verdict, the jury consults both the circumstantial evidence and the direct evidence. We make a few assumptions about the jury’s decision given the suspect’s decision to speak or to remain silent and the type of evidence presented at trial. First, we assume that in the absence of circumstantial evidence, the jury convicts the suspect only if the direct evidence incriminates the suspect. Second, we assume that the jury always acquits the suspect if the circumstantial evidence corroborates the suspect’s statement, even if the direct evidence incriminates the suspect. Thus we assume that if the circumstantial evidence corroborated the suspect’s statement, even if the direct evidence incriminated the suspect, the jury would have a reasonable doubt about the suspect’s guilt. Third, we assume that the circumstantial evidence always corroborates statements made by some innocent suspects. These innocent suspects thus always have incentives to make a statement and thereby exonerate themselves. The fact that some innocent suspects always make a statement implies that a suspect’s decision to remain silent might be considered as evidence of guilt in the absence of a right to silence.

The analysis proceeds by identifying the conditions under which a right to silence alters the equilibrium strategies of innocent and guilty suspects as compared to a legal regime where suspects do not have a right to silence. We show that a right to silence directly benefits innocent suspects in two distinct circumstances. First, a right to silence provides innocent suspects, who are otherwise compelled to speak, with the alternative of silence, thereby reducing the frequency of wrongful conviction. Second, a right to silence benefits innocent suspects who would have remained silent even in the absence of a right to silence. Specifically, innocent suspects who always remain silent (regardless of whether a right to silence exists) are less likely to be wrongfully convicted in a legal regime that respects suspects’ right to silence.

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1 Davies (2007) proposes the following definition for an adverse inference from silence: “The law should permit an adverse inference to be drawn from silence either at police interview or in court when it would be reasonable to expect a denial, explanation or answer from an innocent defendant.”
In addition, our model confirms Seidmann and Stein’s (2000) argument that innocent suspects indirectly benefit from the right to silence. Thus we show that a right to silence benefit innocent suspects who choose to speak because it induces guilty suspects to remain silent, thereby decreasing the probability that innocent suspects whose statements are contradicted are wrongfully convicted. In contrast to Seidmann and Stein’s argument, the result here does not presuppose that the innocent always have incentives to speak.

Our results hold for low as well as for high premium for confession. When the premium for confession is low so that suspects do not find it profitable to confess the crime, a right to silence induces innocent and guilty suspects to shift from speech to silence. If the premium for confession is high so that guilty suspects find it profitable to (sometimes) confess the crime, a right to silence induces innocent suspects to shift from speech to silence and guilty suspects to shift from confession to silence. More generally, whenever a right to silence alters the equilibrium behaviors of either guilty or innocent suspects, the innocent benefit from the right to silence.

Last, a right to silence is socially costly if juries’ preferences are aligned with society’s preferences. This is because a right to silence prevents the jury from considering information that would otherwise increase the accuracy of the jury’s decision. A right to silence may nevertheless be justified as a means of enhancing the protection given to innocent suspects against wrongful conviction.

1.2 Related literature

This paper is related to Seidmann and Stein (2000) and Stein (2005). These papers call to question the argument that the innocent do not benefit from the right to silence if only the guilty exercise it. Seidmann and Stein claim instead that the right to silence benefits the innocent indirectly because by inducing the guilty to remain silent, it bolsters the credibility of statements made by the innocent. In their analysis, Seidmann and Stein presuppose that innocent suspect always benefit from (or at least, are never harmed by) making an exculpatory statement, for the evidence at trial always corroborates an innocent suspect’s statement. Seidmann and Stein then go on to show that innocent suspects are less likely to be wrongfully convicted if suspects have a right to silence. They accordingly conclude that the main justification for the right to silence lies in the fact that it allows the jury to draw a positive inference from a suspect’s decision not to exercise the right.

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2 As Seidman and Stein explain: “The only things that the suspect knows are that silence and lies usually indicate guilt and that the law enforcement authorities -- the police and prosecutors -- will utilize any such indications to the fullest extent that the law allows. Only guilty suspects face this dilemma. In contrast, for innocent suspects, telling a truthful story to the police can only improve (or at least not worsen) their position. Once again, this observation may not apply to very special cases, which we ignore for lack of representativeness.” (Seidman and Stein, 2000, p. 444). We believe, by contrast, that a more reasonable assumption is that innocent suspects might well be reluctant to tell a truthful story (or any story) if they have reasons to think that the police might distort their story or that the prosecution might present evidence to contradict it.
Our model follows the basic framework proposed by Seidmann and Stein (2000), but relaxes the assumption that innocent suspects always have incentives to speak. Instead, we assume that innocent suspects might be reluctant to speak out of fear that the evidence presented at trial would contradict their police statement. To capture this possibility, we assume that the evidence at trial may contradict an innocent suspect’s statement. We show that given the possibility that the evidence contradicts their police statements, innocent suspects may rather remain silent in the presence of a right to silence. This result provides a broader utilitarian justification for the right to silence than is suggested by Seidmann and Stein. This justification to the right to silence also addresses the criticism leveled at the equilibrium proposed by Seidmann and Stein. According to this criticism, juries are not likely to respect the right to silence if only the guilty exercise it. But if innocent and guilty alike exercise the right to silence, then a jury can be expected to refrain from drawing an inference of guilt from silence if so instructed.

Mialon (2005) considers the effects of the right to silence at trial. He considers a model in which the evidence at trial either incriminates the defendant or exonerates him. The defendant, however, may not know the evidence. If the defendant does not present exonerating evidence, then the jury could rationally infer that the defendant is more likely to be guilty. A right to silence prevents the jury from convicting the defendant upon failure to present exonerating evidence, thus benefiting innocent suspects who cannot provide such evidence. In contrast to the model studied here, Mialon’s model assumes that innocent suspects always have incentives to offer exculpatory evidence. In Mialon’s model, therefore, the presence of a right to silence does not affect the innocent’s equilibrium strategy, as it does here.

This paper is not the first to suggest that the innocent benefit from exercising their right to silence. Schulhofer (1991) suggests that the right to silence protects innocent defendants who cannot offer exonerating evidence from the risk involved in forced testimony. Thus, an innocent defendant might fear that he would appear guilty on the stand after skillful cross-examination: “if an innocent defendant chooses silence, it is because his judgment is that testifying will increases the chances of conviction.” (p. 331). In a similar vein, Amar (1997) argues that the ‘cruel trilemma’ should refer to innocent suspects who are forced to testify and concludes that “[a] desire to protect the innocent defendant from erroneous conviction … is wholly consistent with the deep structure of our Bill of Rights.” Indeed, the Supreme Court in Ullmann v. United States (1956, p. 426) notes that people “too readily assume that those who invoke [the right to silence] are either guilty of crime or commit perjury in claiming the privilege.” However, the argument that the innocent directly benefit from the right to silence has not been embedded in a formal model. More specifically, by defining the conditions under which the innocent would rather exercise their right to silent than speak, this paper provides a rigorous basis for the argument that the right to silence directly helps the innocent.

The rest of the paper proceeds as follows. Section 2 presents the model. Section 3 examines a no-right-to-silence regime and Section 4 a right-to-silence regime, given that the premium for confession is low.\(^3\) We show that innocent suspects benefit directly (if

\(^3\) The fact that the premium for confession is low implies that no suspect confesses in equilibrium.
they remain silent), as well as indirectly (if they speak) from the presence of a right to silence. Section 5 examines the effects of a right to silence when the premium for confession is high so that guilty suspects confess in equilibrium. We show that a right to silence benefits the innocent in similar ways when the premium for confession is high and when it is low. Section 6 concludes.

2. Model

- Set up

The model is related to Seidmann’s (2005) model, but modifies some of Seidmann’s main assumptions. A suspect is arrested for committing a crime. The suspect is either guilty or innocent (we will refer to the suspect’s innocence or guilt as the suspect’s ‘type’). The suspect knows whether he is innocent or guilty, but the police and the court cannot observe the suspect’s type. An innocent suspect is one of two types: ‘suspect 1’ and ‘suspect 2.’ We will make clear below the difference between suspect 1 and suspect 2. We denote a guilty suspect as ‘suspect 3.’ The prior probability that the suspect is of type \(i\), where \(i = 1, 2, 3\), is \(P_i\).

The game proceeds in two periods. In period 1, the suspect can confess the crime, remain silent, or make a statement (the suspect’s statement need not be true). If the suspect does not confess the crime, the game proceeds to period 2. In period 2, the case goes to trial and evidence is presented to a jury. The evidence consists of direct evidence and circumstantial evidence. We assume the jury gives equal weight to both types of evidence.

The *direct evidence* is either incriminating or non-incriminating. Incriminating evidence includes physical object or witness testimony that suggests the suspect committed the crime. Let \(\theta_i\), \(i = 1, 2, 3\), denote the probability that the jury is presented with incriminating evidence, conditional on the suspect’s type. We assume that \(\theta_3 > \theta_2 > \theta_1 > 0\); that is, (i) the jury is more likely to be presented with incriminating evidence if the suspect is guilty than if he is innocent (left inequality), and (ii) there is positive probability that the evidence incriminates innocents suspects (right inequality).

The *circumstantial evidence* either corroborates or contradicts the suspect’s period-1 statement. For example, the circumstantial evidence and the suspect’s police statement may concern the whereabouts of the suspect at the time the crime was committed or whether the suspect was previously acquainted with the crime victim. Let \(\delta_i\), \(i = 1, 2, 3\), denote the probability that the circumstantial evidence contradicts the suspect’s statement, conditional on the suspect’s type. We assume that \(1 > \delta_3 > \delta_2 > \delta_1 > 0\); that is, (i) the probability that the circumstantial evidence contradicts the suspect’s statement is higher if the suspect is guilty than if he is innocent, and (ii) the circumstantial evidence

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4 We assume that non-incriminating evidence is simply lack of incriminating evidence. Our results would not change if we introduced a third type of evidence, exonerating evidence, which always leads to acquittal.
always corroborates suspect 1’s statement (recall that suspect 1 is one of two types of innocent suspects). The circumstantial evidence might contradict an innocent suspect’s statement either because the police distort the suspect’s statement or because the evidence at trial is not accurate (for example, a prosecution witness might give false testimony). Since the evidence is more likely to contradict a guilty suspect’s statement than an innocent suspect’s statement, the jury can infer from contradiction that the suspect is more likely to be guilty.

In summary, Table 1 and Table 2 present likelihood matrices of the direct evidence and the circumstantial evidence.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td><strong>Likelihood matrix of direct evidence</strong></td>
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<tr>
<td><strong>Suspect type</strong></td>
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<tr>
<td>Inculminating</td>
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<tr>
<td>Nincriminating</td>
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<th>Table 2</th>
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<tbody>
<tr>
<td><strong>Likelihood matrix of circumstantial evidence</strong></td>
</tr>
<tr>
<td><strong>Suspect type</strong></td>
</tr>
<tr>
<td>Contradictory</td>
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<tr>
<td>Nnoncontradictory</td>
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- **The Suspect’s and the Jury’s Payoffs**

We normalize the suspect’s payoff in the following way. We assume the suspect receives a payoff of 1 if acquitted, a payoff of 0 if convicted, and a payoff of \( 0 < u < 1 \) if he confesses the crime. We will refer to \( u \) as the ‘confession premium.’

We normalize the jury’s payoff as follows. The jury obtains a payoff of 0 if it rightfully convicts or acquits the suspect, a payoff of \(-D\) if it wrongfully acquits the suspect, and a payoff of \(- (1-D)\) if it wrongfully convicts the suspect, where \( D \in (0,1) \). \( D \) represents the standard of proof, or the minimum probability of guilt required for conviction. \( D \) thus reflects the relative costs of Type I (wrongful conviction) versus Type II error (wrongful acquittal). We assume that the jury’s payoffs schedule reflects society’s tradeoff between
Type I and Type II errors. Thus we do not consider the case in which the jury’s preferences diverge from society’s.

- Assumptions

We make the following assumptions about the jury’s payoff-maximizing decisions given different realizations of the evidence.

**Assumption A1.**

\[
\frac{P_3 \theta_3}{P_3 \theta_3 + P_2 \theta_2} > \frac{D}{1 - D} > \frac{P_1 (1 - \theta_3)}{P_1 (1 - \theta_1) + P_2 (1 - \theta_2)}.
\]

Assumption A1 implies that given any history in which the jury does not observe the circumstantial evidence (i.e., all suspect types are silent), the jury would maximize its payoff by always convicting the suspect if the direct evidence incriminates the suspect (left inequality) and by always acquitting the suspect if the direct evidence does not incriminates the suspect (right inequality). It follows from Assumption A1 that if suspect 3 always makes a statement, the jury convicts the suspect if the direct evidence is incriminating and the circumstantial evidence contradicts the suspect’s statement (that is, \(\frac{P_3 \delta_3}{P_3 \delta_3 + P_2 \delta_2} < \frac{D}{1 - D}\)).

**Assumption A2.**

\[
\frac{D}{1 - D} > \frac{P_3 (1 - \delta_3)}{P_3 \delta_3}.
\]

Assumption 2 implies that given any history in which suspect 1 speaks, the jury would maximize its payoff by always acquitting the suspect if the circumstantial evidence corroborates the suspect’s statement, even if the direct evidence incriminates the suspect. This assumption reflects the notion that if the evidence corroborates the suspect’s statement, even if the direct evidence incriminates the suspect, the jury has a reasonable doubt about the suspect’s guilt, and therefore may not convict the suspect. It follows from Assumption A2 that suspect 1 can always exonerate himself by making a statement. In addition, Assumption A2 implies that if all suspect types speak, the jury acquits the suspect if the evidence does not contradict the suspect’s statement, even if the direct evidence incriminates the suspect (that is, \(\frac{P_3 \delta_3 (1 - \delta_3)}{P_3 \delta_3 (1 - \delta_2)} < \frac{D}{1 - D}\)).

**Assumption A3.**

\[
\frac{P_1 (1 - \theta_3)}{P_2 (1 - \theta_2)} > \frac{D}{1 - D}.
\]

Assumption A3 implies that in any history in which suspect 1 speaks, but suspect 2 and suspect 3 remain silent, the jury can infer that the suspect is guilty with probability greater than \(D\) from the fact that the suspect chose to remain silent. Thus, in the absence

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5 More specifically, note that \(\frac{D}{1 - D} < \frac{P_1 \theta_1}{P_1 \theta_1 + P_2 \theta_2} < \frac{P_1 \theta_1 \delta_3}{P_1 \theta_1 \delta_3 + P_2 \theta_2 \delta_2} < \frac{P_1 \theta_1 \delta_3}{P_2 \theta_2 \delta_2}\), where the middle inequality follows because \(\delta_2 < \delta_3\).
of a right to silence, the jury may convict a silent suspect based solely on the suspect’s silence, even if the direct evidence is not incriminating. We call this “adverse inference from silence.” By contrast, when suspects have a right to silence, the jury may not draw an adverse inference of guilt from the suspect’s decision to remain silent. In particular, the jury may not convict the suspect in the absence of incriminating evidence.

We can now define the right to silence as follows.

**Definition 1:** If suspects have a right to silence, then the jury may not convict a silent suspect in the absence of incriminating evidence.

**Assumption A4.** $u \neq 1 - \theta, 1 - \delta$.

Assumption A4 states that the premium for confession is different from $1 - \theta$ and $1 - \delta$. This assumption is made for computational convenience and does not detract from the generality of our results. The relation between the premium for confession and the probability that a specific type of evidence materializes is therefore one of the following.

(i) $u < \min \{1 - \theta, 1 - \delta\}$; (ii) $1 - \theta > u > 1 - \delta$; (iii) $1 - \delta > u > 1 - \theta$; and (iv) $u > \max \{1 - \theta, 1 - \delta\}$.

**Definition 2.**

We say that the right to silence is effective if any suspect’s decision to speak or to remain silent in a no-right-to-silent regime is different from his decision in a right-to-silence regime.

**Lemma 1.**

The right to silence is not effective if $1 - \theta < \min \{1 - \delta, u\}$.

**Proof.**

If $1 - \theta < \min \{1 - \delta, u\}$, suspect 3 never has incentives to remain silent, even if the jury always acquits a silent suspect when the evidence is not incriminating. Specifically, if $1 - \delta > u > 1 - \theta$, suspect 3 would rather speak than either confess or remain silent; if $u > 1 - \delta > 1 - \theta$, suspect 3 would rather confess than either speak or remain silent. Since suspect 3 never remains silent if $1 - \theta < \min \{1 - \delta, u\}$, the jury always acquits a silent suspect if the evidence is not incriminating whether or not suspects have a right to silence. It follows that the right to silence is not effective when $1 - \theta < \min \{1 - \delta, u\}$.

Following Lemma 1, we restrict attention to two cases:

(i) $1 - \theta > 1 - \delta > u$; we will refer to this case as a ‘low premium for confession;’
(ii) $1 - \theta_3 > u > 1 - \delta_3$; we will refer to this case as a ‘high premium for confession.’

- Significance of setup

Underlying the setup of this model is the notion that some innocent suspects (suspect 2) may be reluctant to speak out of fear that the evidence at trial erroneously contradicts their statement. For example, an innocent suspect may fear that the prosecution would fabricate evidence or that his police statement would be distorted. However, since an innocent suspects’ statement is more likely to be consistent with the evidence than a guilty suspects’ statement, the jury can consider as relevant evidence the fact that the evidence at trial contradicts the suspect’s statement.

3. No Right-to-Silence

In this section, we consider the case in which suspects do not have a right to silence. We assume that the premium for confession is low so that $1 - \theta_3 > 1 - \delta_3 > u$. The assumption that the premium for confession is low implies that no suspect would find it profitable to confess in equilibrium. In section 5, we extend the analysis to the case where suspect 3 confesses in equilibrium.6

We begin by considering suspect 1’s dilemma of whether to speak or to remain silent in period 1. Recall that the evidence always corroborates suspect 1’s statement (that is, $\delta_1 = 0$). It follows that suspect 1 always speaks, for silence may result in conviction (if the evidence is incriminating), but making a statement always leads to acquittal.

Next, consider suspect 2’s and suspect 3’s decisions whether to speak or to remain silent. Since suspect 1 speaks, the jury would draw an adverse inference of guilt from the suspect’s silence if both suspect 2 and suspect 3 remained silent (see Assumption 3). Since $1 > \delta_3 > \delta_2 > 0$, suspect 2 and suspect 3 can exonerate themselves with some positive probability by making a statement. Thus, an equilibrium in which both suspect 2 and suspect 3 remain silent in the absence of a right to silence does not exist. Similarly, an equilibrium in which suspect 2 speaks (or mixes between silence and speech), but suspect 3 remains silent, does not exist for the jury will always acquit a speaking suspect. Suspect 2 as well as suspect 3 could then profitably deviate to always speaking, thereby exonerating themselves.

Two equilibrium candidates are left. In one equilibrium, both suspect 2 and suspect 3 speak. In this equilibrium, the jury always convicts a silent suspect (off-equilibrium). In the other equilibrium, suspect 2 remains silent and suspect 3 mixes between speech and silence. In this equilibrium, the jury must convict a silent suspect with such probability so as to make suspect 3 indifferent between speech and silence. Suspect 3, in turn, must mix

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6 Innocent suspects never have incentives to confess even if the premium for confession is high.
between speech and silence so as to make the jury indifferent between acquitting and convicting a silent suspect.

Proposition 1 presents the equilibrium outcomes in the absence of a right to silence. As a tiebreaker, we assume that suspect 2 speaks if he is indifferent between speech and silence.

**Proposition 1** (equilibrium strategies under a right to silence and low confession premium)

Assume the premium for confession is low so that $1 - \theta_1 > 1 - \delta_1 > u$. If suspects do not have a right to silence, then the following strategy profiles constitute the only perfect Bayesian equilibria that survive the Universal Divinity refinement of Banks and Sobel (1987). (We relegate to the Appendix the jury’s out-of-equilibrium beliefs and corresponding strategy).

(a) Suspect 1 always speaks.

(b) If $\frac{1 - \theta_1}{1 - \delta_1} > \frac{1 - \theta_2}{1 - \delta_2}$, both suspect 2 and suspect 3 speak. The jury acquits the suspect if the evidence does not contradict the suspect’s statement, and convicts the suspect if the evidence contradicts the suspect’s statement.

(c) If $\frac{1 - \theta_1}{1 - \delta_1} < \frac{1 - \theta_2}{1 - \delta_2}$, suspect 2 remains silent, and suspect 3 remains silent with probability $\frac{p_3(1 - \theta_3)}{p_3(1 - \theta_3) + \delta_1 - \theta_3}$ and otherwise speaks. The jury always convicts a silent suspect if the evidence is incriminating, convicts a silent suspect with probability $\frac{\delta_1 - \theta_1}{1 - \theta_1}$ if the evidence is not incriminating, and otherwise acquits a silent suspect. The jury acquits the suspect if the evidence corroborates the suspect’s statement, and convicts the suspect if the evidence contradicts the suspect’s statement.

**Proof.** See the Appendix.

Proposition 1 considers suspects’ decision to speak or to remain silent as a function of the conditional probabilities that different types of evidence materialize at trial.

Recall that the circumstantial evidence always corroborates suspect 1’s statement. Accordingly, suspect 1 is always acquitted if he speaks, but may be convicted if he remains silent (if the evidence is incriminating). Suspect 1 therefore always speaks (part (a)).

Part (b) presents a pooling equilibrium under which both suspect 2 and suspect 3 speak. Such equilibrium exists if the ratio of the probability that the evidence is not incriminating to the probability that the evidence corroborates the suspect’s statement is higher for suspect 3 than for suspect 2. Note that in this equilibrium the jury always
convicts a silent suspect (off-equilibrium) so that all suspects cannot profitably deviate from their equilibrium strategies.

Part (c) presents a semi-pooling equilibrium under which suspect 2 remains silent and suspect 3 mixes between speech and silence so that the jury always convicts a silent suspect if the evidence is incriminating, but mixes between acquittal and conviction if the evidence is not incriminating. Such equilibrium exists if the ratio of the probability that the evidence does not incriminate the suspect to the probability that the evidence corroborates the suspect’s statement is higher for suspect 2 than for suspect 3. Note that in this equilibrium suspect 2 (who always remains silent) is convicted with positive probability even when the evidence is not incriminating, but silence yields suspect 2 a greater payoff than speech.

To illustrate the different equilibria in a no-right-to-silence regime, consider the following examples.

Example 1: \( \theta_2 \approx \theta_3 \) \((\Rightarrow \frac{1-\theta_2}{1-\theta_3} > \frac{1-\theta_3}{1-\theta_2})\).

If \( \theta_2 \approx \theta_3 \), the probabilities that the evidence incriminates suspect 2 and suspect 3 are roughly the same. Thus, suspect 2 is not able to distinguish himself from suspect 3 by remaining silent. Since the probability that the evidence contradicts the suspect’s statement is lower for suspect 2 than for suspect 3 (i.e., \( \delta_2 < \delta_3 \)), suspect 2’s best way of separating himself from suspect 3 is to speak. Since suspect 2 always speaks, suspect 3 must always speak as well, for the jury will surely convict a silent suspect.

Example 2: \( \delta_2 \approx \delta_3 \) \((\Rightarrow \frac{1-\delta_2}{1-\delta_3} < \frac{1-\delta_3}{1-\delta_2})\).

If \( \delta_2 \approx \delta_3 \), the probabilities that the evidence contradicts suspect 2’s and suspect 3’s statements are roughly the same. Thus, suspect 2 is not able to distinguish himself from suspect 3 by speaking. Since the probability of incriminating evidence is lower for suspect 2 than for suspect 3 (i.e., \( \theta_2 < \theta_3 \)), suspect 2’s best way of separating himself from suspect 3 is to remain silent. Suspect 3, in turn, mixes between silence and speech, because always remaining silent will result in conviction.

Now, since \( \delta_3 > \theta_3 \), suspect 3 would found it profitable to always remain silent if the jury believed that a silent suspect is innocent. Thus, the jury must convict a silent suspect with some positive probability if the evidence is not incriminating so that suspect 3 is indifferent between silence and speech.

Corollary 1

*When the premium for confession is \( 1-\theta_3 > 1-\delta_3 > u \) and suspects do not have a right to silence:*
(a) suspect 2’s equilibrium payoff is $1 - \delta_2$ if he speaks and is higher than $1 - \delta_2$ and lower than 1 if he remains silent.

(b) suspect 3’s equilibrium payoff is $1 - \delta_3$.

Suspect 2’s equilibrium payoff is equal to or is higher than $1 - \delta_2$, since suspect 2 can always secure a payoff of $1 - \delta_2$ by speaking. Thus, suspect 2 remains silent if and only if his payoff from silence is greater than $1 - \delta_2$. The reason that suspect 3’s equilibrium payoff is $1 - \delta_3$ is as follows. If suspect 2 always speaks, suspect 3 always speaks as well, for the jury will always convict a silent suspect. In this case, suspect 3’s equilibrium payoff is $1 - \delta_3$. If suspect 2 remains silent, suspect 3 must mix between speech and silence, for if suspect 3 always remains silent the jury will always convict a silent suspect, and if suspect 3 always speaks the jury will always acquit a silent suspect. For suspect 3 to mix between speech and silence, suspect 3 must be indifferent between his payoff from speech and his payoff from silence. Suspect 3 must therefore earn a payoff of $1 - \delta_3$ whether he speaks or remains silent.

4. Right to Silence

In this section, we consider the case in which suspects have a right to silence. We maintain the assumptions that the premium for confession is low so that no suspect can profitably confess in equilibrium (i.e., $1 - \theta_3 > 1 - \delta_3 > u$). A right to silence prevents a jury from drawing an inference of guilt from the suspect’s silence. Specifically, if the suspect remains silent, the jury must reach its verdict based solely on the presence or absence of incriminating evidence.

We begin by considering suspect 1’s decision whether to speak or to remain silent. Suspect 1 always speaks in a right-to-silence regime, for he is surely acquitted if he speaks, but may be convicted if he remains silent (if the evidence is incriminating).

Next, consider suspect 2’s and suspect 3’s decisions whether to speak or to remain silent. The assumption that $1 - \theta_3 > 1 - \delta_3$ implies that suspect 3 never finds it optimal always to speak, for he can profitably deviate to silence. Thus there is no pooling equilibrium in which both suspect 2 and suspect 3 speak (as in the case of a no-right-to-silence regime). Similarly, there is no semi-pooling equilibrium in which suspect 2 remains silent and suspect 3 mixes between speech and silence (as in the case of a no-right-to-silence regime), because suspect 3 can profitably deviate to silence.

The presence of a right to silence, however, introduces two equilibrium candidates that do not exist in the absence of a right to silence. In one equilibrium, both suspect 2 and suspect 3 remain silent. (Recall that in the absence of right to silence, such equilibrium is not feasible because the jury draws an inference of guilt from silence, thereby inducing both suspect 2 and suspect 3 to profitably deviate to speech). In the other equilibrium, suspect 2 speaks and suspect 3 mixes between speech and silence. (Recall that in the
absence of a right to silence such equilibrium is not feasible because the jury draws an
inference of guilt from silence, thereby inducing suspect 3 to profitably deviate to
speech).

Proposition 2 presents the equilibrium outcomes in the presence of a right to silence. As a
tiebreaker, we assume that suspect 2 speaks if he is indifferent between speech and
silence.

**Proposition 2** (*equilibrium strategies under a right to silence and low confession
premium*)

Assume the premium for confession is low so that $1 - \theta_3 > 1 - \delta_3 > u$. If suspects have a
right to silence, then the following strategy profiles constitute the only perfect Bayesian
equilibria that survive the Universal Divinity refinement. (We relegate to the Appendix
out-of-equilibrium beliefs and strategies).

(a) Suspect 1 always speaks.

(b) if $\frac{1 - (\theta_1 / \delta_1)}{1 - \theta_1} < \frac{1 - (\theta_3 / \delta_3)}{1 - \theta_3}$, suspect 2 and suspect 3 remain silent. The jury acquits a silent
suspect if the evidence is not incriminating and convicts a silent suspect if the evidence is
incriminating.

(c) if $\frac{1 - (\theta_1 / \delta_1)}{1 - \theta_1} \geq \frac{1 - (\theta_3 / \delta_3)}{1 - \theta_3}$, suspect 2 speaks, and suspect 3 speaks with probability
$\frac{p_3 \delta_3 (1 - \theta_1)}{p_3 \delta_3 (1 - \theta_1) + p_2 \delta_2 (1 - \theta_2)} \cdot \frac{D}{1 - D}$ and otherwise remains silent. The jury convicts the suspect if the evidence is
incriminating, convicts the suspect with probability $\frac{(\theta_1 / \delta_1) - \theta_1}{1 - \theta_1}$ if the evidence contradicts
the suspect’s statement and the evidence is not incriminating, and otherwise acquits the
suspect. The jury acquits a silent suspect if the evidence is not incriminating, and convicts
a silent suspect if the evidence is incriminating.

**Proof.** See the Appendix.

Proposition 2 considers suspects’ decision to speak or to remain silent as a function of the
conditional probabilities that different types of evidence materialize at trial, given that
suspects have a right to silence.

Part (b) presents a pooling equilibrium under which both suspect 2 and suspect 3 always
remain silent. Such equilibrium exists when one minus the ratio of the probability that the
evidence is incriminating to the probability that the evidence contradicts the suspect’s
statement divided by the probability that the evidence is not incriminating is higher for
suspect 2 than for suspect 3. Note that in this equilibrium both innocent and guilty
suspects exercise their right to silence. In particular, in the absence of a right to silence,
the jury would draw an adverse inference from the suspect’s silence and thereby always
convict a silent suspect.
Part (c) presents a semi-pooling equilibrium under which suspect 2 always speaks and suspect 3 mixes between speech and silence. The jury, in turn, (i) mixes between acquitting and convicting the suspect if the evidence contradicts the suspect’s statement and the evidence is not incriminating, and (ii) always convicts the suspect if the evidence contradicts the suspect’s statement and the evidence is incriminating. Such equilibrium exists when one minus the ratio of the probability that the evidence is incriminating to the probability that the evidence contradicts the suspect’s statement divided by the probability that the evidence is not incriminating is higher for suspect 3 than for suspect 2.

Note that in this equilibrium, contradiction does not always result in conviction (if the evidence is not incriminating), because suspect 3 does not always speak. Note also that in this equilibrium suspect 3 exercises his right to silence. In particular, in the absence of a right to silence, the jury would draw an adverse inference from silence and will always convict a silent suspect.

To illustrate the equilibria under which suspect exercise their right to silence, consider the following examples.

Example 3: $\theta_2 \approx \theta_3 \quad (\Rightarrow \frac{1-(\theta_3/\delta_3)}{1-\theta_2} > \frac{1-(\theta_2/\delta_2)}{1-\theta_2})$.

If $\theta_2 \approx \theta_3$, the probabilities that the evidence incriminates suspect 2 and suspect 3 are roughly the same. Thus, suspect 2 cannot distinguish himself from suspect 3 by remaining silent. Since the probability that the evidence contradicts the suspect’s statement is lower for suspect 2 than for suspect 3 (i.e., $\delta_2 < \delta_3$), suspect 2’s best way of separating himself from suspect 3 is to speak. Now, since $\theta_3 < \delta_3$, suspect 3 would rather remain silent than always speaks. But always remaining silent cannot be an equilibrium strategy for suspect 3, for the jury will always acquit a speaking suspect. Thus, suspect 3 must mix between silence and speech.

Example 4: $\delta_2 \approx \delta_3 \quad (\Rightarrow \frac{1-(\theta_2/\delta_2)}{1-\theta_2} < \frac{1-(\theta_3/\delta_3)}{1-\theta_3})$.

If $\delta_2 \approx \delta_3$, the probabilities that the evidence contradicts suspect 2’s and suspect 3’s statements are roughly the same. Thus, suspect 2 is not able to distinguish himself from suspect 3 by speaking. Since the probability that the evidence incriminates the suspect is higher for suspect 3 than for suspect 2 ($\theta_3 > \theta_2$), suspect 2’s best way of separating himself from suspect 3 is to remain silent. Now, since $\theta_3 < \delta_3$, suspect 3 would rather remain silent that always speaks. Thus, both suspect 2 and suspect 3 always remain silent.

Corollary 2

When the premium for confession is low so that $1-\theta_3 > 1-\delta_3 > u$ and suspects have a right to silence:
(a) suspect 2’s equilibrium payoff is greater than \( \max\{1 - \theta_2, 1 - \delta_2\} \), but lower than 1, if he speaks and is \( 1 - \theta_2 \) if he remains silent.

(b) suspect 3’s equilibrium payoff is \( 1 - \theta_3 \).

Suspect 2’s equilibrium payoff is equal to or is greater than \( \theta_2 - \delta_2 \) if he remains silent. If he speaks and is effective, suspect 3 remains silent with positive probability. Suspect 3 thus must be indifferent between remaining silent and speaking. Accordingly, suspect 3’s equilibrium payoff must be \( 1 - \theta_3 \).

Proposition 3 considers the effect of a right to silence on suspect 2’s and/or suspect 3’s equilibrium strategies.

**Proposition 3** (effects of a right to silence on the equilibrium strategies with low confession premium)

Assume that the premium for confession is low so that \( 1 - \theta_3 > 1 - \delta_3 > u \). Then:

(a) if \( \frac{1 - \theta_2}{1 - \delta_2} \geq \frac{1 - \theta_2}{1 - \delta_2} \) and \( \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} \geq \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} \); suspect 2 always speaks in the absence of a right to silence as well as in the presence of a right to silence; suspect 3 always speaks in the absence of a right to silence and mixes between speech and silence in the presence of a right to silence.

(b) if \( \frac{1 - \theta_2}{1 - \delta_2} \geq \frac{1 - \theta_2}{1 - \delta_2} \) and \( \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} < \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} \), suspects 2 and 3 always speak in the absence of a right to silence, and always remain silent in the presence of a right to silence.

(c) if \( \frac{1 - \theta_2}{1 - \delta_2} < \frac{1 - \theta_2}{1 - \delta_2} \); suspect 2 always remains silent in the absence of a right to silence as well as in the presence of a right to silence; suspect 3 mixes between speech and silence in the absence of a right to silence and always remains silent in the presence of a right to silence.\(^7\)

(d) if suspect 2 always remains silent in the absence of a right to silence, then he also always remains silent in the presence of a right to silence (i.e., if \( \frac{1 - \theta_2}{1 - \delta_2} \leq \frac{1 - \theta_2}{1 - \delta_2} \), then \( \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} < \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} \)).

**Proof.** Parts (a) – (c) follow directly from Proposition 1 and Proposition 2. To prove Part (d), note that \( \frac{1 - \theta_2}{1 - \delta_2} \leq \frac{1 - \theta_2}{1 - \delta_2} \) implies that \( \frac{1 - \delta_2}{1 - \theta_2} \geq \frac{1 - \delta_2}{1 - \theta_2} \). Rearranging terms we get

\(^7\) Observe that if \( \frac{1 - \theta_2}{1 - \delta_2} < \frac{1 - \theta_2}{1 - \delta_2} \), then \( \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} < \frac{1 - (\theta_2/\delta_2)}{1 - \theta_2} \).
\[
\frac{\delta_2 - \theta_2}{1 - \delta_2} > \frac{\delta_1 - \theta_1}{1 - \delta_1}. 
\] Since \( \frac{1}{\delta_2} > \frac{1}{\delta_1} \), it follows that \( \frac{1}{\delta_2} \cdot \frac{\delta_2 - \theta_2}{1 - \delta_2} > \frac{1}{\delta_1} \cdot \frac{\delta_1 - \theta_1}{1 - \delta_1} \). This, in turn, implies that \( \frac{1 - (\theta_2 / \delta_2)}{1 - \delta_2} > \frac{1 - (\theta_1 / \delta_1)}{1 - \delta_1} \).

Proposition 3 presents the effects of a right to silence on the equilibrium strategies of suspect 2 and suspect 3.

Part (a) presents the case in which a right to silence causes suspect 3 to shift from always speaking to mixing between speech and silence, but does not alter suspect 2’s equilibrium strategy of always speaking. This equilibrium is the one suggested by Seidmann and Stein (2000) and Seidmann (2005) to justify the right to silence. Under this equilibrium, suspect 2 benefits from a right to silence even though he always speaks whether or not a right to silence exists, because the jury convicts a suspect whose statement is contradicted by the evidence with lower probability if suspects have a right to silence.

Part (b) presents the case in which a right to silence induces both suspect 2 and suspect 3 to shift from speech to silence. Specifically, both suspect 2 and suspect 3 always speak in the absence of a right to silence, but both always remain silent in the presence of a right to silence. In this equilibrium, an innocent suspect benefits from a right to silence directly, because his equilibrium payoff when he remains silent in the presence of a right to silence is higher than his equilibrium payoff when he speaks in the absence of a right to silence.

Part (c) presents the case in which a right to silence causes suspect 3 to shift from mixing between silence and speech to always remaining silent, but does not alter suspect 2’s equilibrium strategy of always remaining silent. Although suspect 2’s strategy is not affected by the presence of a right to silence (i.e., suspect 2 always remains silent whether or not a right to silence exists), suspect 2 benefits directly from a right to silence because the right prohibits the jury from convicting a silent suspect if the evidence is not incriminating. In the absence of a right to silence, by contrast, suspect 2 is convicted with positive probability when he remains silent even if the evidence is not incriminating.

Part (d) states that if suspect 2 remains silent in the absence of a right to silence, he also remains silent in the presence of a right to silence (the reverse is not true). Thus, a right to silence never causes suspects to shift from silence to speech, but may cause them to shift from speech to silence.

To illustrate the effect of a right to silence on suspect 2’s and suspect 3’s equilibrium strategies, consider the following examples.

**Example 5:** \( \theta_2 \approx \theta_3 \) (\( \Rightarrow \frac{1 - \theta_2}{1 - \delta_2} > \frac{1 - \theta_2}{1 - \delta_1} \) and \( \frac{1 - (\theta_1 / \delta_1)}{1 - \theta_1} > \frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2} \))

When \( \theta_2 \approx \theta_1 \), the probabilities that the evidence incriminates suspect 2 and suspect 3 are roughly the same. As a result, suspect 2’s best way of separating himself from suspect 3 is to speak, regardless of whether suspects have a right to silence. Suspect 3 must also speak in the absence of a right to silence, for the jury always convicts a silent suspect.
Since $\theta_3 < \delta_1$, suspect 3 shifts from always speaking (in the absence of a right to silence) to mixing between silence and speech (in the presence of a right to silence). Suspect 2 benefits from a right to silence, even though he does not exercise it, because the jury convicts the suspect if the evidence contradicts the suspect’s statement with lower probability as compared to a no-right-to-silence regime.

**Example 6:** $\delta_2 \approx \delta_3$ ($\Rightarrow \frac{1-\theta_3}{1-\theta_2} < \frac{1-\theta_3}{1-\theta_1}, \frac{1-(\theta_1/\delta_3)}{1-\theta_1} < \frac{1-(\theta_1/\delta_2)}{1-\theta_2}, \frac{\theta_3}{\delta_2} < 1$).\(^8\)

When $\delta_2 \approx \delta_3$, the probabilities that the evidence contradicts suspect 2’s and suspect 3’s statements are roughly the same. As a result, suspect 2’s best way of separating himself from suspect 3 is to remain silent, regardless of whether suspects have a right to silence. Introducing a right to silence causes suspect 3 to always remain silent. Suspect 2 benefits from a right to silence because the jury must not convict a silent suspect unless the evidence is incriminating if suspects have a right to silence, but the jury convicts a silent suspect with positive probability in the absence of a right to silence.

**Example 7:** $\delta_2 = 0.2$, $\delta_3 = 0.3$, $\theta_2 = 0.1$, and $\theta_3 = 0.2$ ($\Rightarrow \frac{0.8}{0.7} = \frac{1-\theta_3}{1-\theta_2} > \frac{1-\theta_3}{1-\theta_1} = \frac{0.9}{0.8}$), and

\[
\frac{0.333}{0.8} = \frac{1-(\theta_1/\delta_3)}{1-\theta_3} < \frac{1-(\theta_1/\delta_2)}{1-\theta_2} = \frac{0.5}{0.9}.
\]

When $\frac{1-\theta_1}{1-\theta_3} > \frac{1-\theta_1}{1-\theta_2}$, both suspect 2 and suspect 3 always speak in the absence of a right to silence. When $\frac{1-(\theta_1/\delta_3)}{1-\theta_3} < \frac{1-(\theta_1/\delta_2)}{1-\theta_2}$, both suspect 2 and suspect 3 always remain silent in the presence of a right to silence. Thus, a right to silence induces both suspect 2 and suspect 3 to shift from speech to silence. A right to silence directly helps suspect 2 by providing him with a safer alternative to speech.

5. High premium for confession

In this section, we consider the case in which the premium for confession is high so that suspect 3 may confess in equilibrium. Specifically, we assume that $1-\delta_3 > u > 1-\theta_3$.

Proposition 4(1) presents the equilibrium outcomes in the absence of a right to silence given that the premium for confession is high. As a tiebreaker, we assume that suspect 2 speaks if he is indifferent between speech and silence.

**Proposition 4.1** (equilibrium strategies with no right to silence and a high confession premium)

\[8\] To see that $\delta_2 \approx \delta_3$ implies $\frac{1-(\theta_1/\delta_3)}{1-\theta_3} < \frac{1-(\theta_1/\delta_2)}{1-\theta_2}$, let $\delta = \delta_2 = \delta_3$. Then $\theta_2(1-\delta) < \theta_1(1-\delta)$ (since $\theta_2 < \theta_3$). It follows that $-\theta_2 - \delta \theta_2 < -\theta_2 - \delta \theta_3$. Adding $\delta + \theta_2 \theta_2$ to each side we get $\delta - \theta_2 - \delta \theta_2 + \theta_2 \theta_2 < \delta - \theta_2 - \delta \theta_3 + \theta_2 \theta_2$. This can be rewritten as $(\delta - \theta_2)(1-\theta_2) < (\delta - \theta_2)(1-\theta_3)$. Dividing both sides by $(1-\theta_2)(1-\theta_1)$ yields $\frac{\delta - \theta_2}{1-\theta_3} < \frac{\delta - \theta_2}{1-\theta_2}$. Multiplying both sides by $1/\delta$ we finally get $\frac{1-(\theta_1/\delta)}{1-\theta_3} < \frac{1-(\theta_1/\delta)}{1-\theta_2}$.
Assume that the premium for confession is high so that $1 - \theta_3 > u > 1 - \delta_3$. Then if suspects do not have a right to silence, the following strategy profiles constitute the only Perfect Bayesian equilibria that survive the Universal Divinity refinement. (We relegate to the Appendix out-of-equilibrium beliefs and strategy):

(a) If $\frac{1 - \theta_2}{1 - \delta_2} \leq \frac{\delta_3(1 - \theta_3)}{u(\delta_1 - \delta_2) + \delta_2(1 - \delta_3)}$, suspect 2 always speaks, and suspect 3 speaks with probability $\frac{p_3(1 - \theta_3)}{p_3(1 - \theta_3) + p_3(1 - \theta_3)} \cdot \frac{D}{1 - D}$ and otherwise confesses. The jury convicts the suspect if the evidence contradicts the suspect's statement and the evidence is not incriminating with probability $1 - \frac{u}{1 - \delta_3}$ and otherwise acquits the suspect.

(b) If $\frac{1 - \theta_2}{1 - \delta_2} > \frac{\delta_3(1 - \theta_3)}{u(\delta_1 - \delta_2) + \delta_2(1 - \delta_3)}$, suspect 2 always remains silent, and suspect 3 remains silent with probability $\frac{p_3(1 - \theta_3)}{p_3(1 - \theta_3) + p_3(1 - \theta_3)} \cdot \frac{D}{1 - D}$ and otherwise confesses. The jury convicts a silent suspect if the evidence is incriminating, convicts a silent suspect if the evidence is not incriminating with probability $1 - \frac{u}{1 - \delta_3}$ and otherwise acquits a silent suspect.

Proof. See the Appendix.

Part (a) presents a semi-pooling equilibrium in which suspect 2 always speaks and suspect 3 mixes between speech and confession. Part (b) presents a semi-pooling equilibrium in which suspect 2 always remains silent and suspect 3 mixes between silence and confession.

Proposition 4.2 (equilibrium strategies with a right to silence and a high confession premium)

Assume the premium for confession is high so that $1 - \theta_3 > u > 1 - \delta_3$. Then if suspects have a right to silence, the equilibrium outcomes are identical to the case in which the premium for confession is low (i.e., $1 - \theta_3 > 1 - \delta_3 > u$).

The rationale for Proposition 4(2) is straightforward. If the premium for confession is low ($1 - \theta_3 > u > 1 - \delta_3$), suspect 3 obtains a higher payoff from exercising his right to silence than from confessing. Accordingly, suspect 3 never has incentives to confess the crime. The equilibrium outcomes are thus identical to the case in which the premium for confession is low ($1 - \theta_3 > 1 - \delta_3 > u$).

Proposition 4.3 (effects of the right to silence on the equilibrium strategies with high confession premium)

Assume that the premium for confession is high so that $1 - \theta_3 > u > 1 - \delta_3$. Then:

(a) if $\frac{1 - \theta_2}{1 - \delta_2} \leq \frac{\delta_3(1 - \theta_3)}{u(\delta_1 - \delta_2) + \delta_2(1 - \delta_3)}$ and $\frac{1 - (\theta_2 / \delta_2)}{1 - \delta_2} \geq \frac{1 - (\theta_2 / \delta_2)}{1 - \delta_2}$: suspect 2 always speaks in the absence of a right to silence as well as in the presence of a right to silence; suspect 3 mixes between
speech and confession in the absence of a right to silence and mixes between speech and silence in the presence of a right to silence.

(b) if \( \frac{1-\theta_2}{1-\delta_2} \leq \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \) and \( \frac{1-(\theta_1/\delta_1)}{1-\theta_1} > \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \): suspects 2 always speaks in the absence of a right to silence and always remains silent in the presence of a right to silence; suspect 3 mixes between confession and speech in the absence of a right to silence and always remain silent in the presence of a right to silence.

(c) if \( \frac{1-\theta_2}{1-\delta_2} > \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \), suspects 2 always remains silent in the absence of a right to silence as well as in the presence of a right to silence; suspect 3 mixes between confession and silence in the absence of a right to silence and always remains silent in the presence of a right to silence.

(d) if suspect 2 always remains silent in a no-right-to-silence regime, then he also always remains silent in a right-to-silence regime (i.e., if \( \frac{1-\theta_2}{1-\delta_2} > \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \) then \( \frac{1-(\theta_1/\delta_1)}{1-\theta_1} < \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \).

**Proof.** Parts (a) - (c) follow directly from Proposition 4(1) and Proposition 4(2). To prove part (d), note that \( \frac{1-\theta_2}{1-\delta_2} > \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \) implies that \( \frac{1-\delta_2}{1-\delta_2} < \frac{\delta_2(1-\theta_2)+\delta_3(1-\delta_2)}{\delta_3(1-\delta_2)} \). The latter inequality can be written as \( \frac{1-\delta_2}{1-\delta_2} = \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} - \frac{\delta_2}{\delta_3(1-\delta_2)} \). Multiplying the right side of the latter inequality by \( \frac{\delta_2}{\delta_3} > 1 \) yields \( \frac{1-\delta_2}{1-\delta_2} < \frac{\delta_2}{\delta_3(1-\delta_2)} - \frac{\delta_2}{\delta_3(1-\delta_2)} \). The last inequality simplifies to \( \frac{1-\delta_2}{1-\delta_2} < \frac{1-\delta_2}{1-\delta_2} \), which implies \( \frac{1-\theta_2}{1-\delta_2} > \frac{1-\theta_2}{1-\delta_2} \). Now, recall from Proposition 3(d) that \( \frac{1-\theta_2}{1-\delta_2} > \frac{1-\theta_2}{1-\delta_2} \) entails \( \frac{1-(\theta_1/\delta_1)}{1-\theta_1} < \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \). Thus, if \( \frac{1-\theta_2}{1-\delta_2} > \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \), then \( \frac{1-(\theta_1/\delta_1)}{1-\theta_1} < \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \).

Part (a) presents the case in which a right to silence causes suspect 3 to shift from mixing between speech and confession to mixing between speech and silence, but does not alter suspect 2’s strategy of always speaking. Although suspect 2’s strategy is not affected by the presence of a right to silence (i.e., suspect 2 always speaks whether or not a right to silence exists), suspect 2 benefits directly from a right to silence because the jury convicts a suspect whose statement is contradicted by the evidence with lower probability if suspects have a right to silence.

Part (b) presents the case in which a right to silence induces suspect 2 to shift from always speaking to always remaining silent and induces suspect 3 to shift from mixing between speech and confession to always remaining silent. In this equilibrium, an innocent suspect benefits directly from a right to silence because his equilibrium payoff when he remains silent in the presence of a right to silence is higher than his equilibrium payoff when he speaks in the absence of a right to silence.

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9 If \( \frac{1-\theta_2}{1-\delta_2} > \frac{\delta_2(1-\theta_2)}{u(\delta_2-\delta_3)+\delta_3(1-\delta_2)} \), then \( \frac{1-(\theta_1/\delta_1)}{1-\theta_1} < \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \).
Part (c) presents the case in which a right to silence induces suspect 3 to shift from mixing between silence and confession to always remaining silent, but does not alter suspect 2’s strategy of always remaining silent. Although suspect 2’s strategy is not affected by the presence of a right to silence (i.e., suspect 2 always remains silent whether or not a right to silence exists), suspect 2 benefits directly from a right to silence because the right prohibits the jury from convicting a silent suspect if the evidence is not incriminating. In the absence of a right to silence, by contrast, suspect 2 is convicted with positive probability when he remains silent even if the evidence is not incriminating.

Part (d) states that if suspect 2 always remains silent in the absence of a right to silence, he also always remains silent in the presence of a right to silence (the reverse is not true). Thus, as in the case in which the premium for confession is low, a right to silence never causes suspects to shift from silence to speech. A right to silence may only cause suspects to shift from speech to silence or from confession to silence.

6. Conclusion

This paper proposes a model that considers the effects of a right to silence on innocent and guilty suspects’ decisions to speak or to remain silent. We show that a right to silence benefits innocent suspects by inducing them to shift from speech to silence, thereby providing them with a safer alternative to speech. In addition, a right to silence benefits innocent suspects even if it does not alter their decision to speak or to remain silent. Specifically, a right to silence decreases the probability of wrongful conviction of innocent suspects who always remain silent or always speak regardless of whether a right to silence exists. The paper thus provides a broad utilitarian basis for the argument that the right to silence helps the innocent.
APPENDIX

Proposition 1(b)

Assume $1 - \theta_3 > 1 - \delta_3 > u$ and suspects do not have a right to silence. Then if $\frac{1 - \theta_3}{1 - \delta_3} \geq \frac{1 - \theta_3}{1 - \delta_3}$, the following strategy profile constitutes the unique perfect Bayesian equilibrium of the game. Both suspect 2 and suspect 3 speak. The jury’s acquits the suspect if the evidence corroborates the suspect’s statement, and convicts the suspect if the evidence contradicts the suspect’s statement. The jury’s out-of-equilibrium beliefs are that a silent suspect is guilty with probability greater than $D$; accordingly, the jury always convicts a silent suspect off-equilibrium.

Proof.

We will proceed by showing that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. We will then show that this equilibrium outcome is unique.

Given that the jury always convicts a silent suspect, neither suspect 2 nor suspect 3 can profitably deviate to silence. Given that both suspect 2 and suspect 3 speak, the jury maximizes its payoff by convicting the suspect if the evidence contradicts the suspect’s statement and by acquitting the suspect if the evidence corroborates the suspect’s statement (see Assumption 2).

To show uniqueness, observe that the only other equilibrium candidate is one in which suspect 2 always remains silent and suspect 3 mixes between speech and silence. Since $\theta_3 < \delta_3$, the jury must acquit a silent suspect if the evidence is not incriminating with probability $\frac{1 - \theta_3}{1 - \delta_3}$, and otherwise convict a silent suspect so as to make suspect 3 indifferent between speech and silence.\(^{10}\)

Suspect 2’s payoff in this putative equilibrium is $(1 - \theta_2) \frac{1 - \theta_3}{1 - \delta_3}$ (recall that in this putative equilibrium suspect 2 always remains silent). But from $\frac{1 - \theta_3}{1 - \delta_3} \geq \frac{1 - \theta_3}{1 - \delta_3}$ it follows that $1 - \delta_2 \geq (1 - \theta_2) \frac{1 - \theta_3}{1 - \delta_3}$. Thus, suspect 2 can profitably deviate to speech; this, in turn, upsets the proposed equilibrium.

\(^{10}\) To see this, note that if the jury acquits a silent suspect with probability $1 - \frac{1 - \theta_3}{1 - \delta_3}$ if the evidence is incriminating, then suspect 3’s payoff from silence is $(1 - \theta_3)(1 - \frac{1 - \theta_3}{1 - \delta_3})$, which is equal to $1 - \delta_3$. 

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**Proposition 1(c)**

Assume that $1 - \theta_3 > 1 - \delta_3 > u$ and that suspects do not have a right to silence. Then if $\frac{1 - \theta_1}{1 - \theta_3} < \frac{1 - \theta_3}{1 - \delta_3}$, the following strategy profiles constitute the only perfect Bayesian equilibrium of the game that survives the Universal Divinity refinement. Suspect 2 always remains silent and suspect 3 remains silent with probability $\frac{P_3(1 - \theta_3)}{P_3(1 - \theta_3)} \cdot \frac{D}{1 - D}$ and otherwise speaks. The jury convicts a silent suspect if the evidence is incriminating, convicts a silent suspect with probability $\frac{\delta_3 - \theta_3}{1 - \theta_3}$ if the evidence is not incriminating and otherwise acquits a silent suspect. The jury acquits the suspect if the evidence corroborates the suspect’s statement and convicts the suspect if the evidence contradicts the suspect’s statement.

**Proof.** We will proceed by showing that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. Then, using the Universal Divinity refinement, we will show that this equilibrium outcome is unique.

First, consider suspect 2’s equilibrium strategy. Suspect 2’s equilibrium payoff is $(1 - \theta_2)(1 - \frac{\delta_3 - \theta_3}{1 - \theta_3})$, which simplifies to $(1 - \theta_2)(1 - \frac{\delta_3 - \theta_3}{1 - \theta_3})$ (recall that a silent suspect is always convicted if the evidence is incriminating and is convicted with probability $\frac{\delta_3 - \theta_3}{1 - \theta_3}$ if the evidence is not incriminating). If suspect 2 speaks, he is acquitted with probability $1 - \delta_2$. Thus suspect 2’s payoff from speech is $1 - \delta_2$. From $\frac{1 - \theta_2}{1 - \delta_2} < \frac{1 - \theta_3}{1 - \delta_3}$, it follows that $(1 - \theta_2)(1 - \frac{\delta_3 - \theta_3}{1 - \theta_3}) > 1 - \delta_2$. Thus, suspect 2 cannot profitably deviate to speech.

Next, consider suspect 3’s strategy. If suspect 3 always speaks, he is acquitted with probability $1 - \delta_3$. Suspect 3’s payoff if he always speaks is therefore $1 - \delta_3$. Suspect 3’s payoff if he always remains silent is $(1 - \theta_3)(1 - \frac{\delta_3 - \theta_3}{1 - \theta_3})$ (since suspect 3 is always convicted if the evidence is incriminating and is convicted with probability $\frac{\delta_3 - \theta_3}{1 - \theta_3}$ if the evidence is not incriminating). Simplifying we get that suspect 3’s payoff from always remaining silent is $1 - \delta_3$. Thus, suspect 3 is indifferent between speaking and remaining silent. In particular, remaining silent with probability $\frac{P_3(1 - \theta_3)}{P_3(1 - \theta_3)} \cdot \frac{D}{1 - D}$ is a best response (although not uniquely).

Now, by Bayes’ rule, the probability that the suspect is guilty given that the suspect is silent and the evidence is not incriminating is $(P_3 \frac{P_3(1 - \theta_3)}{P_3(1 - \theta_3)} \cdot \frac{D}{1 - D}(1 - \theta_3)) / (P_3 \frac{P_3(1 - \theta_3)}{P_3(1 - \theta_3)} \cdot \frac{D}{1 - D}(1 - \theta_3) + P_2(1 - \theta_2))$, which simplifies to $(P_2(1 - \theta_2) \cdot \frac{D}{1 - D}) / (P_2(1 - \theta_2) \cdot \frac{D}{1 - D} + P_2(1 - \theta_2) \cdot \frac{D}{1 - D})$, which is equal $D$. It follows that the jury is indifferent between acquitting and convicting a silent suspect if the evidence is not incriminating. In particular, convicting a silent suspect if the evidence is not incriminating with probability $\frac{\delta_3 - \theta_3}{1 - \theta_3}$ is a best response (although not uniquely).
To show uniqueness, observe that the only other equilibrium candidate is one in which both suspect 2 and suspect 3 speak. Under this equilibrium, the jury acquits the suspect if the evidence does not contradict the suspect’s statement, and convicts the suspect if the evidence contradicts the suspect’s statement. To support this equilibrium, the jury’s out-of-equilibrium beliefs must be that a silent suspect is guilty with probability higher than \( D \). We will show, however, that the jury’s out-of-equilibrium beliefs do not survive the Universal Divinity refinement.

First, note that \( \theta_3 < \delta_3 \) together with \( \frac{1-\theta_3}{1-\delta_3} < \frac{1-\theta_2}{1-\delta_2} \) imply that \( \theta_2 < \delta_2 \). Let \( q_i \) denote the probability with which the jury must convict a silent suspect if the evidence is not incriminating so as to make suspect \( i \), \( i = \{1,2\} \), indifferent between speech and silence. \( q_i \) must therefore satisfy the equality \( (1-\theta_i)(1-q_i) = 1-\delta_i \); hence, \( q_i = \frac{\delta_i-\theta_i}{1-\theta_i} \).

Now, from \( \frac{1-\theta_3}{1-\delta_3} < \frac{1-\theta_2}{1-\delta_2} \), it follow that \( \frac{1-\delta_3}{1-\theta_3} < \frac{1-\delta_2}{1-\theta_2} \). Therefore, \( q_2 = 1-\frac{1-\delta_2}{1-\theta_2} > \frac{1-\delta_3}{1-\theta_3} = q_3 \). It follows that the set of jury’s responses for which suspect 2 would find deviation to silence profitable is larger than the set of jury’s responses for which suspect 3 would find such deviation profitable. The jury must therefore believe that deviation to silence comes from suspect 2 and accordingly acquit a silent suspect. This, in turn, upsets the proposed equilibrium.

**Proposition 2(b)**

Assume \( 1-\theta_3 > 1-\delta_3 > u \) and suspects have a right to silence. Then if \( \frac{1-(\theta_2/\delta_2)}{1-\theta_2} < \frac{1-(\theta_3/\delta_3)}{1-\theta_3} \), the following strategy profile constitutes the unique perfect Bayesian equilibrium of the game: Suspect 2 and suspect 3 remain silent. The jury acquits a silent suspect if the evidence is not incriminating and convicts a silent suspect if the evidence is incriminating. The jury’s out-of-equilibrium beliefs are that the suspect is guilty with probability higher than \( D \) if the evidence contradicts the suspect’s statement.

**Proof.**

We will show that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. We will then show that this equilibrium outcome is unique.

Both suspect 2 and suspect 3 wouldn’t find it profitable to deviate to speech if the jury convicts a suspect whose statement is contradicted. To see this, note that \( \delta_3 > \theta_3 \) together with \( \frac{1-(\theta_3/\delta_3)}{1-\theta_3} < \frac{1-(\theta_2/\delta_2)}{1-\theta_2} \) implies \( \delta_2 > \theta_2 \); hence, \( 1-\theta_2 > 1-\delta_2 \). Now, suspect 2’s equilibrium payoff is \( 1-\theta_2 \). By deviating, suspect 2 gains \( 1-\delta_2 \) (the probability the evidence does not contradict his statement). Since \( 1-\theta_2 > 1-\delta_2 \), suspect 2 cannot profitably deviate from his equilibrium strategy.
Next, consider suspect 3. Suspect 3’s equilibrium payoff is $1 - \theta_2$. If he deviates to speech, he gains $1 - \delta_2$ (the probability the evidence does not contradict his statement). But since $1 - \theta_3 > 1 - \delta_3$, suspect 3 cannot profitably deviate from his equilibrium strategy.

To show uniqueness, observe that there are only two other equilibrium candidates. In one equilibrium, which both suspect 2 and suspect 3 speak; in the other, suspect 2 speaks and suspect 3 mixes between speech and silence. The former equilibrium can be ruled out because $\delta_3 > \theta_3$ together with $\frac{1 - (\theta_2 / \delta_3)}{1 - \theta_2} < \frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2}$ implies $\delta_2 > \theta_2$; this, in turn, implies that $1 - \delta_2 < 1 - \theta_2$. Thus, suspect 2 can profitably deviate to silence, which in turn upsets the proposed equilibrium.

Next, consider an equilibrium in which suspect 2 speaks and suspect 3 mixes between speech and silence. In such an equilibrium, the jury must convict a suspect whose statement is contradicted by the evidence if the evidence is not incriminating with probability $q$ so as to make suspect 3 indifferent between speech and silence. $q$ must therefore satisfy the equality $1 - \theta_2 = 1 - \delta_3 + \delta_3[(1 - \theta_2)(1 - q)]$. Solving for $q$ we have

$q = 1 - \frac{\delta_3 - \theta_2}{\delta_3 (1 - \theta_2)}$. It follows that suspect 2’s equilibrium payoff under this putative equilibrium is $1 - \delta_2 + \delta_2 (1 - \theta_2) \frac{\delta_3 - \theta_2}{\delta_3 (1 - \theta_2)}$. But $\frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2} < \frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2}$ implies

$1 - \delta_2 + \delta_2 (1 - \theta_2) \frac{\delta_3 - \theta_2}{\delta_3 (1 - \theta_2)} < 1 - \theta_2$. Thus, suspect 2 can profitably deviate to silence. This, in turn, upsets the proposed equilibrium.

**Proposition 2(c)**

Assume $1 - \theta_3 > 1 - \delta_3 > u$ and that suspects have a right to silence. Then if $\frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2} \geq \frac{1 - (\theta_2 / \delta_2)}{1 - \theta_2}$, the following strategy profile constitutes the unique perfect Bayesian equilibrium that survives the Universal Divinity refinement. Suspect 2 speaks, and suspect 3 speaks with probability $\frac{\theta_3 (1 - \theta_2)}{\theta_3 (1 - \theta_2) + \frac{\theta_3 (1 - \theta_2)}{1 - \theta_3}}$ and otherwise remains silent. The jury convicts the suspect if the evidence contradicts the suspect’s statement and the evidence is incriminating, convicts the suspect with probability $\frac{(\theta_3 / \delta_3) \theta_3}{1 - \theta_3}$ if the evidence contradicts the suspect’s statement and the evidence is non-incriminating, and otherwise acquits the suspect. The jury acquits a silent suspect if the evidence is not incriminating, and convicts a silent suspect if the evidence is incriminating.

**Proof.**

We will show that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. We will then show that this equilibrium outcome is unique.
Consider first suspect 2. Suspect 2’s equilibrium payoff is equal to 
\[ 1 - \delta_2 + \delta_2 (1 - \theta_2)(1 - \frac{(\theta_1/\delta_1) - \theta_1}{1 - \theta_1}), \]
which simplifies to 
\[ 1 - \delta_2 \theta_2 \left( \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \right). \]
By deviating to silence, suspect 2 can gain 
\[ 1 - \theta_2. \]
But the assumption 
\[ \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \geq \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \]
implies that 
\[ (1 - \theta_2)^{\frac{1 - (\theta_1/\delta_1)}{1 - \theta_1}} \geq 1 - \frac{(\theta_1/\delta_1)}{1 - \theta_1}, \]
which, in turn, implies 
\[ \delta_2 (1 - \theta_2) \left( \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \right) \geq \delta_2 - \theta_2, \]
or,
\[ -\delta_2 + \theta_2 \left( \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \right) \geq -\theta_2. \]
Therefore, 
\[ 1 - \delta_2 + \theta_2 \left( \frac{1 - (\theta_1/\delta_1)}{1 - \theta_1} \right) \geq 1 - \theta_2. \]
Thus, suspect 2 cannot profitably deviate to silence.

Suspect 3’s payoff from speech in equilibrium is 
\[ 1 - \delta_3 + \delta_3 (1 - \theta_3)(1 - \frac{(\theta_1/\delta_1) - \theta_1}{1 - \theta_1}), \]
which simplifies to 
\[ 1 - \delta_3 + \theta_3 (1 - \theta_3) \left( \frac{\delta_3 - \theta_1}{\delta_3(1 - \theta_3)} \right), \] and thus is equal to 
\[ 1 - \theta_3. \]
As a result, suspect 3 is indifferent between speech and silence. In particular, speaking with probability 
\[ \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \cdot \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \] is a best response (although not uniquely).

Finally, consider the jury’s equilibrium strategy. The probability that the suspect is guilty given that the evidence contradicts the suspect’s statement and the evidence is not incriminating is 
\[ \left( \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \cdot \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \right) \frac{D}{1 - D} \delta_3 (1 - \theta_3) \left( \frac{\delta_3 - \theta_1}{\delta_3(1 - \theta_3)} \right), \]
which simplifies to 
\[ \left( \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \cdot \frac{P_3 \delta_3 (1 - \theta_3)}{P_3 \delta_3 (1 - \theta_3)} \right) \frac{D}{1 - D} \delta_3 (1 - \theta_3) \left( \frac{D}{1 - D} \right), \]
which is equal to 
\[ D \delta_3 (1 - \theta_3) \left( \frac{D}{1 - D} \right). \]
It follows that the jury is indifferent between acquitting and convicting a silent suspect if the evidence is not incriminating. In particular, convicting a silent suspect if the evidence is not incriminating with probability 
\[ \frac{(\theta_1/\delta_1) - \theta_1}{1 - \delta_1} \] is a best response (although not uniquely).

To show uniqueness, observe that there are only two other equilibrium candidates. In one equilibrium, suspect 2 and suspect 3 speak; in the other, suspect 2 and suspect 3 remain silent. Now, if suspect 2 and suspect 3 speak, suspect 3’s equilibrium payoff is 
\[ 1 - \delta_3. \]
But since 
\[ 1 - \theta_3 \geq 1 - \delta_3, \]
suspect 3 can profitably deviate to silence, which in turn upsets this equilibrium. Next, consider an equilibrium in which both suspect 2 and suspect 3 remain silent. To support this equilibrium, the jury’s out-of-equilibrium beliefs must be that a suspect whose statement is contradicted by the evidence is guilty with probability higher than 
\[ D. \]
We will show, however, that the jury’s out-of-equilibrium beliefs do not survive the Universal Divinity refinement.

First, assume that 
\[ \theta_2 > \delta_2. \]
Then even if the jury always convicts a suspect whose statement is contradicted, suspect 2 will find it profitable to deviate. By contrast, suspect 3 would not find it profitable to deviate to speech if the jury always convicted a suspect whose statement is contradicted (since 
\[ \theta_3 < \delta_3. \]
Thus, the jury must believe that deviation to speech comes from suspect 2 and therefore always acquit a suspect who speaks.
Next, assume that $\theta_2 < \delta_2$. Let $q_i$ denote the probability with which the jury convict a suspect whose statement is contradicted by the evidence if the evidence is not incriminating so that suspect $i$, $i=1,2$, is indifferent between silence and speech. Then $q_i$ satisfies $1 - \theta_2 = 1 - \delta_3 + \delta_2(1 - \theta_2)(1 - q_i)$. Solving for $q_i$, we get $q_i = 1 - \frac{\delta_2 - \theta_2}{\delta_3 (1 - \theta_2)}$. But the assumption $\frac{1 - (\theta_2/\delta_3)}{1 - \theta_2} \geq 1 - \frac{\theta_2/\delta_3}{1 - \theta_2}$ implies $q_2 = 1 - \frac{\delta_2 - \theta_2}{\delta_3 (1 - \theta_2)} \geq 1 - \frac{\theta_2/\delta_3}{1 - \theta_2} = q_3$. It follows that the set of jury’s responses for which suspect 2 would find deviation to speech profitable is larger than the set of jury’s responses for which suspect 3 would find such deviation profitable. The jury must therefore believe that deviation to speech comes from suspect 2 and therefore always acquit a suspect who speaks. This, in turn, upsets the proposed equilibrium.

**Proposition 4.1(a)**

Assume that $1 - \theta_3 > u > 1 - \delta_3$ and that suspects do not have a right to silence. Then if

$$1 - \frac{\theta_2}{\theta_3} \leq \frac{\delta_3 (1 - \theta_2)}{\delta_3 (1 - \theta_2) + \delta_3 (1 - \theta_2)}$$

the following strategy profile constitutes the only Perfect Bayesian equilibrium that survives the Universal Divinity refinement: Suspect 2 speaks, and suspect 3 speaks with probability $\frac{p_2 \delta_2 (1 - \theta_2)}{p_3 \delta_3 (1 - \theta_2)} \cdot \frac{D}{1 - D}$ and otherwise confesses. The jury convicts the suspect if the evidence contradicts the suspect’s statement and the evidence is not incriminating with probability $1 - \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)}$ and otherwise acquits the suspect. The jury’s out-of-equilibrium beliefs are that a silent suspect is guilty with probability greater than or equal to $D$; accordingly the jury always convicts a silent suspect off-equilibrium.

**Proof.** We first prove that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. We then show that this equilibrium outcome is unique.

Let us begin by showing that suspect 2 cannot profitably deviate to confession. Given the jury’s equilibrium strategy, suspect 2’s equilibrium payoff is $1 - \delta_2 + \delta_2(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)}$. Observe that $1 - \delta_2 + \delta_2(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)} > 1 - \delta_2 + \delta_2(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)}$ (since $\theta_2 > \theta_3$). Now, the right-hand side of the inequality above simplifies to $1 - \delta_2 + \delta_2 \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)}$. Factoring out $\delta_2$ we get $1 - \delta_2 (1 - \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)})$, which is equal to $1 - \frac{\delta_2}{\delta_3} (1 - u)$, which is strictly greater than $u$ (since $1 - u - \frac{\delta_2}{\delta_3} (1 - u) > 0$). Thus, $1 - \delta_2 + \delta_2(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)} > u$, as required.

Next, we prove that suspect 3 is indifferent between speech and confession. Given the jury’s equilibrium strategy, suspect 3’s payoff from speech is $1 - \delta_3 + \delta_3(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_2)}$, which is equal to $u$, as required.

Finally, we show that the jury is indifferent between acquitting and convicting the suspect if the evidence contradicts the suspect’s statement and the evidence is not incriminating. The probability that the suspect is guilty given that the evidence contradicts the suspect’s
statement and the evidence is incriminating is
\[
(P_2 \delta_2 (1 - \theta_2) \frac{P_2 \delta_2 (1 - \theta_2)}{P_2 \delta_2 (1 - \theta_2)} \cdot \frac{D}{1 - D} + P_2 \delta_2 (1 - \theta_2))
\]
\[
= (P_2 \delta_2 (1 - \theta_2) \cdot \frac{D}{1 - D})(P_2 \delta_2 (1 - \theta_2) \cdot \frac{D}{1 - D} + P_2 \delta_2 (1 - \theta_2) \frac{D}{1 - D}) = D. \]
The jury is thus indifferent between acquitting and convicting the suspect if the evidence contradicts the suspect’s statement and the evidence is incriminating. In particular, convicting the suspect with probability \(1 - \frac{u - (1 - \delta_3)}{\delta_3 (1 - \theta_3)}\) is a best response (although not uniquely).

To show uniqueness, observe that there are only two other equilibrium candidates. In one equilibrium, suspect 2 always remains silent and suspect 3 mixes between confession and silence; in the other, both suspect 2 and suspect 3 speak. The latter equilibrium can be ruled out because suspect 3 can profitably deviates to confession, given \(3 > u\). To sustain an equilibrium in which suspect 2 always remains silent and suspect 3 mixes between confession and silence, the jury’s out-of-equilibrium beliefs must be that a suspect whose statement is contradicted by the evidence is guilty with probability greater than \(D\). We will show that the jury’s out-of-equilibrium beliefs do not survive the Universal Divinity refinement.

Let \(q_i\) denote the probability with which the jury convicts a suspect whose statement is contradicted if the evidence is not incriminating so that suspect \(i\), \(i \in \{2, 3\}\), is indifferent between his equilibrium strategy and silence. Notice that (i) \(q_3 > 0\) since \(\delta_3 > \theta_3\), and that (ii) if \(\delta_2 < \theta_2\) then \(q_2 = 0\). Thus, if \(\delta_2 < \theta_2\), then \(q_3 > q_2\). Now, if \(\delta_2 > \theta_2\), then \(q_2\) satisfies the equality \((1 - \theta_2) \frac{u}{1 - \theta_2} = 1 - \delta_2 + \delta_2 (1 - \theta_2) (1 - q_2)\). Solving for \(q_2\) we get
\[
q_2 = \frac{1 - \delta_2}{\delta_2 (1 - \theta_2)} + 1 - \frac{u}{\delta_2 (1 - \theta_2)}. \]

If \(\frac{1 - \theta_2}{1 - \theta_2} \geq \frac{\delta_2 (1 - \theta_2)}{u (\delta_2 - \theta_2) + \delta_2 (1 - \theta_2)}\), then \(1 - \delta_2 \geq \frac{u (\delta_2 - \theta_2) + \delta_2 (1 - \theta_2)}{\delta_2 (1 - \theta_2)}\), which in turn implies
\[
1 - \delta_2 \geq \frac{\delta_2 (1 - \theta_2) - u \delta_2}{\delta_2 (1 - \theta_2)}, \]

Dividing both sides by \(\delta_2\) gives \(1 - \delta_2 \geq \frac{\delta_2 (1 - \theta_2) - u}{\delta_2 (1 - \theta_2)}\). Adding \(1\) to both sides gives \(q_2 = \frac{1 - \delta_2}{\delta_2 (1 - \theta_2)} + 1 - \frac{u}{\delta_2 (1 - \theta_2)} \geq \frac{(1 - \delta_2)}{\delta_2 (1 - \theta_2)} + 1 - \frac{u}{\delta_2 (1 - \theta_2)} = q_3\). It follows that the set of jury’s responses for which suspect 2 would find deviation to speech profitable is larger than the set of jury’s responses for which suspect 3 would find such deviation profitable. It follows that deviation to speech is more likely to come from suspect 2 than from suspect 3. The jury must therefore always acquit a suspect who speaks. This, in turn, upsets the proposed equilibrium.

\[\square\]

**Proposition 4.1(b)**

Assume \(1 - \theta_3 > u > 1 - \delta_3\) and that suspects do not have a right to silence. Then if \(\frac{1 - \theta_2}{1 - \theta_2} > \frac{\delta_2 (1 - \theta_2)}{u (\delta_2 - \theta_2) + \delta_2 (1 - \theta_2)}\), the following strategy profile constitutes the only Perfect Bayesian equilibrium that survives the Universal Divinity refinement. Suspect 2 remains silent, and suspect 3 remains silent with probability \(\frac{P_2 (1 - \theta_2)}{P_2 (1 - \theta_2)} \cdot \frac{D}{1 - D}\) and otherwise confesses. The jury
convicts a silent suspect if the evidence is incriminating, convicts a silent suspect if the evidence is not incriminating with probability \( 1 - \frac{u}{1 - \delta_1} \) and otherwise acquits a silent suspect. The jury’s out-of-equilibrium beliefs are that the suspect is guilty if the evidence contradicts the suspect’s statement; accordingly the jury’s convicts the suspect if the evidence contradicts the suspect’s statement.

**Proof.** We first prove that suspect 2, suspect 3, and the jury cannot profitably deviate from their equilibrium strategies. We then show that this equilibrium outcome is unique.

Let us begin by showing that suspect 2 cannot profitably deviate to confession. Given the jury’s equilibrium strategy, suspect 2’s equilibrium payoff is \( (1 - \theta_2) \frac{u}{1 - \delta_1} \). Since \( \theta_2 < \theta_1 \), it follows that \( \frac{1 - \theta_2}{1 - \theta_1} > 1 \), and therefore \( (1 - \theta_2) \frac{u}{1 - \delta_1} > u \), as required.

We prove next that suspect 3 is indifferent between silence and confession. Given the jury’s equilibrium strategy, suspect 3’s payoff from silence is \( (1 - \theta_3) \frac{u}{1 - \delta_1} \), which is equal to \( u \), as required.

Finally, let us show that the jury is indifferent between acquitting and convicting a silent suspect if the evidence is not incriminating. The probability that a silent suspect is guilty given that the evidence is not incriminating is

\[
\left( P_3(1 - \theta_3) \frac{\delta_2(1 - \theta_2)}{\delta_3(1 - \theta_3)} \cdot \frac{D}{1 - D} \right) \left( P_3(1 - \theta_3) \frac{\delta_2(1 - \theta_2)}{\delta_3(1 - \theta_3)} \cdot \frac{D}{1 - D} + P_2(1 - \theta_2) \right)
\]

\[
= \left( P_3 \delta_2(1 - \theta_2) \cdot \frac{D}{1 - D} \right) \left( P_3 \delta_2(1 - \theta_2) \cdot \frac{D}{1 - D} + P_2 \delta_2(1 - \theta_2) \frac{D}{1 - D} \right) = D.
\]

The jury is thus indifferent between acquitting and convicting the suspect if the evidence contradicts the suspect’s statement and the evidence is incriminating. In particular, convicting the suspect with probability \( 1 - \frac{u}{1 - \delta_1} \) is a best response (although not uniquely).

To show uniqueness, observe that there are only two other equilibrium candidates. In one equilibrium, all suspects speak. This equilibrium cannot be sustained because suspect 3 can profitably deviate to confession. In the other equilibrium, suspect 2 speak and suspect 3 mixes between speech and confession. To support this equilibrium, the jury’s out-of-equilibrium beliefs must be that a silent suspect is guilty with probability greater than \( D \). We will show, however, that the jury’s out-of-equilibrium beliefs do not survive the Universal Divinity refinement.

Let \( q_i \) denote the probability with which the jury convicts a silent suspect if the evidence is not incriminating so that suspect \( i, i \in \{2, 3\} \), is indifferent between his equilibrium strategy and silence. Notice that (i) \( q_3 > 0 \) since \( \delta_3 > \theta_3 \), and that (ii) if \( \delta_2 < \theta_2 \), then \( q_2 = 0 \). Thus, if \( \delta_2 < \theta_2 \), then \( q_3 > q_2 \).

Now, if \( \delta_2 > \theta_2 \), then \( q_2 \) satisfies the equality \( (1 - \theta_2)(1 - q_2) = 1 - \delta_2 + \delta_2(1 - \theta_2) \frac{u - (1 - \delta_3)}{\delta_3(1 - \theta_3)} \). Solving for \( q_2 \) we get \( q_2 = \frac{\delta_2 - \theta_2}{1 - \theta_2} - \delta_2 \frac{u - (1 - \delta_3)}{\delta_3(1 - \theta_3)} \). \( q_3 \) must satisfy the equality
(1 - \theta_2)(1 - q_2) = u. Solving for \( q_3 \) we get \( q_3 = 1 - \frac{u}{1 - \theta_2} \). Now, if \( \frac{1 - \theta_1}{1 - \theta_2} > \frac{\delta_1(1 - \theta_1)}{u(\delta_1 - \theta_2) + \delta_1(1 - \theta_1)} \) then \\
\( \frac{1 - \theta_1}{1 - \theta_2} < \frac{u(\delta_1 - \theta_2) + \delta_1(1 - \theta_1)}{\delta_1(1 - \theta_1)} \), which in turn implies \( 1 - \frac{1 - \theta_1}{1 - \theta_2} > 1 - \frac{u(\delta_1 - \theta_2) + \delta_1(1 - \theta_1)}{\delta_1(1 - \theta_1)} \), or, equivalently, \\
\( q_2 = \frac{\delta_1 - \theta_1}{1 - \theta_2} - \frac{\delta_2}{\delta_1(1 - \theta_1)} > 1 - \frac{u}{(1 - \theta_1)} = q_3 \). It follows that the set of jury’s responses for which suspect 2 would find deviation to silence profitable is larger than the set of jury’s responses for which suspect 3 would find such deviation profitable. The jury must therefore believe that deviation to silence comes from suspect 2; accordingly, the jury must always acquit a silent suspect. This, in turn, upsets the proposed equilibrium. ■
References


