

Reasonable Doubt

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Preamble of the U.S. Constitution

We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Judicial decision-making is one of the fundamental duties of any government, and the principles underlying its implementation are crucially important to the success and longevity of a government. Yet, it seems that most people in the U.S. have only a vague understanding of the principles that guide our judicial system, including the meaning of reasonable doubt, the central component of this system. Since the logic behind the principles of judicial decision-making is the same as the logic associated with statistical hypothesis testing, we often discuss judicial trials in our Statistics courses as a way to introduce hypothesis testing. What I would like to present here is a more detailed discussion of the principles of judicial decision-making and their implementation in our system. This discussion will consider those issues associated with the process that governs all trials, not those that arise from a particular individual trial, although there will be some aspects of these principles that could add insight to some of the more controversial trials that have been conducted in our recent history. This discussion is presented from the perspective of a professor of Statistics, not a professor of Constitutional Law. Readers are encouraged to seek out other discussions of these issues from experts in that field.

When someone is arrested and charged with a criminal offense, a decision must be made about the guilt or innocence of the accused. A policy governing the process that is followed to arrive at this decision must address three basic attributes of any system for judicial decision-making:

1. the risk of convicting an innocent defendant
2. the risk of not convicting a guilty defendant
3. time allowed to make a decision

The first two attributes can be represented by the following table:

		Actual State	
		Innocent	Guilty
Decision	Innocent	✓	Error
	Guilty	Error	✓

Two possible errors can occur, depending on the decision. If the jury's decision is not to convict, but the defendant is actually guilty, then an error has occurred. This error, in which a guilty defendant is set free, is something we don't want to happen. The thought of a criminal being set free after committing a terrible crime is very disturbing. Although we may wish to design a policy under which guilty defendants are never set free, the only such policy is one which convicts every defendant. Since we have seen that innocent people are sometimes arrested and brought to trial, that policy also guarantees that every innocent defendant would be convicted. Clearly that policy is unreasonable. A different type of error occurs if the jury's decision is to convict, but the defendant is actually innocent. We don't want this error to occur either, especially if we are the innocent defendants who are convicted under that policy. Also, for every innocent defendant wrongfully convicted, there is a guilty person who actually committed the crime and who has, in effect, been set free. The only way to guarantee that an innocent defendant is never convicted is not to convict anyone. But as this would allow every guilty defendant to be set free, it also is an unreasonable policy. **Therefore, the only sensible policy for judicial decision-making is one under which, from time to time, innocent defendants are convicted and from time to time, guilty defendants are not convicted.**

Sixth Amendment to the U.S. Constitution

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defense.

Since we must design a policy under which both types of errors may occur, it would be desirable for this policy to guarantee that these mistakes happen very infrequently. However, there is a third component to judicial decision-making that makes this impossible: the time needed to make the decision. Because these three attributes of judicial decision-making are interrelated, we can control only two of the three attributes; the third is a function of the other two. Therefore, the only way to ensure that both types of errors occur very infrequently is not to place any boundary on the time required to reach a decision. For example, it is very likely that some crimes more than 25 years old could have been adjudicated with significantly less risk for error if the trials for those crimes had waited for today's DNA identification techniques. We can reasonably expect that 25 years from now

there will be new technologies available that would allow correct adjudication of some current trials if we deferred making those decisions until that technology becomes available. The problem associated with having no set boundary to the time allowed to make a decision is how to treat the defendant while waiting for that future technology. If the defendant is imprisoned during this time, the effect would be just the same as though the defendant were convicted and sentenced to at least 25 years in prison. If the defendant is not imprisoned, the effect would be the same as not convicting the defendant. Therefore, the Sixth Amendment places a limit on the amount of time allowed between arrest and trial.

Fifth Amendment to the U.S. Constitution

*No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without **due process of law**; nor shall private property be taken for public use, without just compensation.*

Fourteenth Amendment to the U.S. Constitution, Section 1

*All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without **due process of law**; nor deny to any person within its jurisdiction the equal protection of the laws.*

We are left with a choice: design a policy under which time to make a decision is limited and the rate of convicting innocent defendants is kept low, or design a policy under which time to make a decision is limited and the rate of not convicting guilty defendants is kept low. The choice encoded in our Constitution is to require that the time to make a decision is limited and the rate of convicting innocent defendants is kept low. To implement this policy, juries may only convict defendants if they determine that the evidence is very strong for guilt. That is, a jury may convict only if it believes that the doubt concerning their decision to convict is reasonably small. This is the Common Law interpretation of the clause, **due process of law**, in the Fifth and Fourteenth Amendments. If the evidence points towards inno-

cence, if it is inconclusive, or if it is only somewhat strong for guilt, then the jury cannot convict the defendant. Likewise, the jury cannot convict if no evidence is presented. This implies that only the hypothesis of guilt is required to be proven, not innocence. That is, the burden of proof in a trial is placed on the decision to convict.

Since the error which occurs when innocent defendants are convicted is the error we are concerned about and whose rate of occurrence we want kept small, that error is referred to as a **Type I error**. The other error, in which a guilty defendant is not convicted, is referred to as a **Type II error**.

		Actual State	
		Innocent	Guilty
Decision	Innocent	✓	Type II error
	Guilty	Type I error	✓

There is a direct consequence of placing the burden of proof onto the decision to convict. Since we cannot believe a defendant is guilty until after the jury makes a decision to convict, then prior to that time we must presume that the defendant is innocent and treat the defendant accordingly. In particular, this implies that a person who is arrested is not a criminal until a jury returns a guilty verdict, and therefore is entitled to the rights of all persons as defined by the Fifth, Sixth, and Fourteenth Amendments: the right to remain silent, the right to an attorney, the right to a speedy and public trial, etc. This also implies that the strength of the evidence for guilt that is presented during a trial must be assessed under the presumption of the defendant's innocence. That assessment can be thought of as an answer to the question, "how likely is it that the incriminating evidence presented by the prosecution and rebutted by the defense could accrue against an innocent defendant?" This likelihood represents the juror's assessment of the strength of the evidence for guilt. It also represents the likelihood that an innocent defendant has been convicted if the jury decides to convict based on the evidence of the trial.

To follow the **due process** clause of the Fifth and Fourteenth Amendments, each juror must determine his or her standard for **reasonably small doubt**. Reasonable doubt represents what the juror considers to be acceptably small for the risk of convicting an innocent defendant. When put into the context of all trials held under our system of justice, the definition of reasonably small doubt represents what a juror considers to be reasonably small for the proportion of innocent defendants who are wrongly convicted for the crimes in question. A decision to convict or not convict is made by comparing the definition of reasonable doubt to the juror's assessment of the strength of evidence for guilt. If the juror's assessment of the strength of evidence for guilt does not satisfy his or her definition of reasonably small doubt, then the decision must be: do not convict. This decision

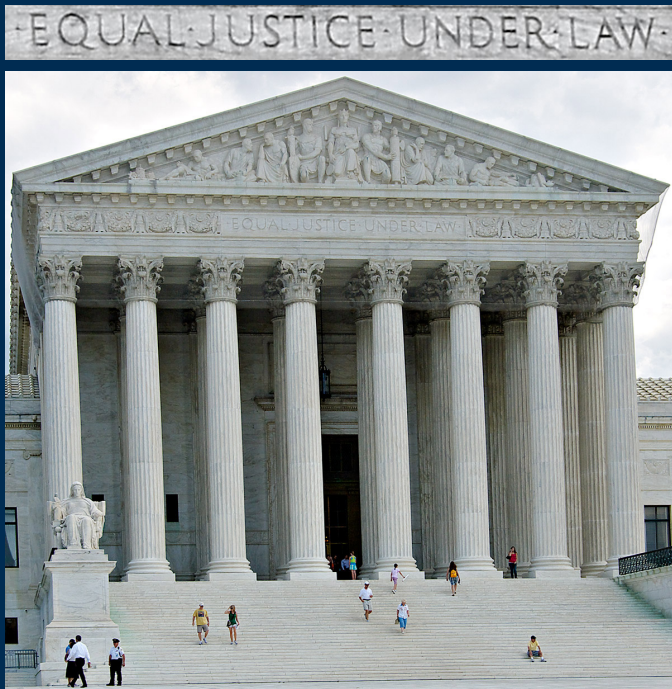


Figure 1: *U.S. Supreme Court Building*

would be reported as: **the evidence is not sufficiently strong to prove guilt**. If the juror's assessment of the evidence meets or is stronger than the definition of reasonable small doubt, then the decision should be to convict. In that case, the likelihood that the evidence has accrued against an innocent defendant represents the chance the jury would be making a Type I error. Note that if the evidence is not sufficiently strong to convict, this does not imply that innocence was proven.

The standard for reasonable doubt should depend on the consequences associated with a Type I error. For example, if a defendant is on trial for simple misdemeanor theft and the punishment is a \$500 fine, then the consequences of a Type I error in this case would be that an innocent person would have to pay this fine unnecessarily and would have a police record of this conviction. If a defendant is on trial for capital murder, then the consequence of Type I error could be that the State would execute an innocent person. Clearly, our standards for reasonable small doubt should be different in these cases.

There is one aspect of judicial decision-making that is not present in statistical decision-making. Reasonable doubt is defined in terms of what is considered to be acceptable for the proportion of innocent defendants who are convicted. If the experiences of some jurors are such that innocent defendants are arrested and brought to trial relatively infrequently, then those jurors would not be inclined to set an extremely stringent standard for reasonable doubt. To such jurors, a moderately small risk of convicting an innocent defendant would still guarantee that few innocent defendants would be convicted since, in their

experience, only a relatively small number of innocent defendants are brought to trial. However, other jurors may have experiences that have convinced them that the number of innocent people who have been arrested is not small. Those jurors would be expected to set a much stronger standard for reasonable doubt to ensure that the **number** of innocent defendants who are convicted is kept reasonably small. Those different experiences could account at least partially for cultural differences in the reactions to some recent sensational trials such as the O.J. Simpson trial.

One conclusion that can be made from this discussion is that we must make every effort to ensure that the process of arresting and charging individuals with crimes does not result in the arrest of innocent people very often. To achieve that, the collection and presentation of evidence for trials must not be abused. All of the rights granted by our Constitution must be strictly enforced and applied to all who have been charged but not yet convicted of crimes. Finally, impartial review of evidence and trial procedures must be available for defendants who have been convicted. If any abuse of these processes is tolerated and influences the outcomes of a few selected trials, then it would be natural to expect that such abuses would continue to affect other trials. Ultimately, faith in our system of justice would be seriously eroded.

Note: the opinions and interpretations presented here are solely and entirely those of the author. Readers are encouraged to explore these and related issues on their own. An excellent resource for such investigations is the Library of Congress, and a visit to the Library is highly recommended to anyone who plans to visit Washington, D.C.



Figure 2: *Library of Congress*