PROBABILITY & THE LAW – FINAL ASSIGNMENT

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For the final assignment, you will experiment with a literary genre of your choice: paper; experiment report; magazine article; dialogue; (the written version of a) closing argument. You may also come up with your own topic and/or literary genre. Length: 7-12 pages. **Please come talk to me before you start working on your final assignment**.

Deadline for intermediate draft: March 13th [optional; grade does not count]

Deadline for final draft: **March 20th**.

Papers. Each paper prompt gives you an idea of the questions you should address in your paper. You are not expected to address all the questions in the prompt. You are free to focus on certain questions and neglect others.

Option 1. This prompt asks you to think about the relation between the *Collins* case, DNA evidence cases, Bayes' theorem, and uniqueness. In the *Collins* appendix, the Court argues that the probability that a second couple in California would match the description is roughly 0.4. How did the Court arrive at this conclusion? The Court did not use Bayes' theorem, but it used the formula for the *binomial distribution*. What was the Court's calculation here? What result do you get if you use Bayes' theorem? Is it the same result?

Further, as we've seen in class, the *Collins* case is similar to a DNA evidence case. Just like in *Collins*, in a DNA evidence case we should be concerned with the question whether a second individual could have a matching DNA profile. This is what we may call the "uniqueness question." If you were to apply the same method used in the *Collins* appendix, how would you go about addressing the uniqueness question in a DNA case? How would you address the uniqueness question by using Bayes' theorem? Do we need to address it at all? Can we bypass it?

Option 2. This prompt asks you to think about the relation between uniqueness and individualized/specific evidence. J.J. Thomson requires that the evidence against a defendant be individualized. In a similar yet different way, the Appellate Court in *Shonubi* requires that the evidence be specific to the defendant.

What notions do Thomson and the Appellate Court in *Shonubi* have in mind? Are they different notions?

Some argue that the notion of specific/individualized evidence does not make any sense at all because no evidence can uniquely single out an individual (not even DNA or fingerprint evidence). They write:

> Perhaps the most serious error is an epistemological one: the assumption that case-specific information is really qualitatively different from base-rate information ... And, indeed, it seems obvious that background base-rate information is about other cases while particularistic information is about this case. Whatever meaning the distinction may have, *it is not one that pertains to the probability of an accurate decision on the facts.* Much of the testimony that is commonly thought of as particularistic only seems so. It is far more probabilistic than we normally allow jurors (or judges) to realize. This includes eyewitness identification ..., fingerprints ..., and anything else we could name. This follows not from the nature (and fallibility) of these particular techniques, but from the nature of the logic of classifying and identifying. All identification techniques place the identified object in a class with others ... There is little, if any, pinpointed, one-person-only evidence in this world. [Saks & Kidd, 1980, p. 151.]

Do you agree with the above quotation? Explain why you agree or not, or why the issue might be more complicated. What would Thomson respond? As you craft your argument, keep in mind different instances of legal evidence (DNA evidence, fingerprint evidence, eyewitness testimony, statistical evidence of various kinds, etc.). Is any of these forms of evidence an instance of individualized/specific evidence?

Option 3. Is it a crime to belong to a reference class? It shouldn't be. Intuitively, one should not be convicted, nor tried, because of the group, category, reference class she belongs to. While commenting on the *Shonubi* case, Colyvan et al. argue that the statistical evidence against Charles Shonubi is defective because of the reference class problem. What is the problem, exactly?

One issue with the reference class argument is that any evidence whatsoever seems to be subject to the reference class problem, as this quotation suggests:

> Perhaps the most important point to note is that reference-class ar-

> guments can be applied to all sorts of evidential inferences, including ones that are not normally taken to prompt antiliability intuitions. Suppose that ... we have an eyewitness who testifies that the bus she saw hit Mrs. Brown was blue. Standard evidence theory is that this evidence can be used to support a finding of liability only via a generalization such as "most eyewitnesses are reliable." But, just as with Shonubi, the eyewitness is a member of a very large number of reference classes, and some of these reference classes may generate inferences of a different strength. [Redmayne, 2008, p. 287]

Do you agree? Is it the case that eyewitness evidence is prone to the reference class problem? Or is eyewitness evidence different in some relevant respect? Do you think the above quotation demolishes Colyvan et al.'s argument? How could they respond, if at all? And finally, do you think DNA evidence is immune to the reference class problem or not?

Experiment report. Run an experiment similar to one Gary Wells run. You should interview a number of people on campus or elsewhere (maybe 5 or 10 or more, depending on your time constraints) and expose them to the scenarios Gary Wells exposed his subjects. Just pick a couple of Wells' scenarios, not all of them. As you interview your subjects, try to understand why they would convict or not in a given scenario. When you have sufficient material, write a brief report. The report could contain: (i) description of your subjects; (ii) interview questions and answers; (iii) quantitative results; (iv) discussion of the results; (v) comparison with Wells' results. Obviously, this need not be to a fully researched paper in experimental psychology.

Magazine article. It is a fallacy to conflate the probability of A given B with the probability of B given A. This conflation is known as the *inversion fallacy*; in the context of trial proceedings, it is known as the *prosecutor's fallacy*, because it is the prosecutor who typically exploits the conflation to his or her own advantage. The prosecutor's fallacy typically occurs in cases, such as DNA evidence cases, in which the probability of an accidental match is very low, and therefore the probability that the defendant is guilty is quite high—wait, I've just committed the prosecutor's fallacy!

Your task is to write a magazine article which describes this form of fallacious reasoning, in the courtroom as well as in everyday life. You should explain—*in*

simple yet precise terms—what the inversion fallacy is, how it negatively affects legal reasoning, and how we can avoid it. You are writing for a popular audience, so your writing should be crisp, elegant, and captivating, but at the same, precise and insightful. This is the challenge.

Dialogue. Some think it an aberration to quantify standards of proof. They think that a mathematization of trial proceedings would make the law an inhuman affair, although it might make verdicts more accurate (see e.g. quotation from Tribe in Handout, week # 1). Others think that standards of proof do not simply require that guilt be proven with a high probability; something more seems required (see e.g. Thomson's article). All in all, we have seen some arguments against a quantification of standards of proof. Now, try to entertain the opposite view. Some people could say that, after all, we are doomed to make mistakes, and a quantification just makes this transparent; a quantification makes our margin of error precise. But is there any harm in transparency? Is there any harm in making things precise? Don't we value transparency and precision? Come up with the strongest possible case in favour of quantifying standards of proof, which would also entail thinking about what it *means* to quantify standards of proof.

Write a dialogue between three interlocutors. The first dislikes the quantification of standards of proof; the second favours it; the third wants to make up his mind. The undecided one will be the arbiter of the discussion. Make the best possible case for each side. The dialogue might have a happy ending (i.e. the three interlocutors end up agreeing) or not (i.e.. the three interlocutors keep disagreeing and become rancorous to each other).

Closing arguments. Pick one of the court cases we discussed: Collins, Jenkins, Smith, Sindell, Shonubi. Write a closing argument on behalf of the prosecutor and one on behalf of the defense. A closing argument summarizes the evidence and explains to the jury why they should acquit or convict. A closing argument should rest primarily on the available evidence; it may point out strengths and weaknesses of the evidence; it may suggest reasons for questioning the evidence; etc. A closing argument has to be particularly well-constructed, very persuasive, and if possible, logically flawless. Once your closing arguments are complete (3-5 pages each), write a brief comment about them (1-3 pages). In your comment, you should point out the errors of reasoning your closing arguments contain (if any), and you should also comment on their overall strengths and weaknesses.