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Trump has been putting a lot of stock in denials, and believes them until forced not to. Early last week when Saudi Crown Prince, MBS, “totally denied” knowing what happened to Jamal Khashoggi, the Washington Post journalist, Trump judged the denial “very strong”. After Saudi Arabia finally acknowledged that Khashoggi died in the Saudi consulate, but claimed that he died accidentally in a fist fight, Trump proclaimed the new Saudi story credible. He thereby accepted their continued denial of premeditated Saudi-sanctioned murder. Only with mounting evidence has Trump expressed doubt.

This summer in Helsinki, Trump emphasized that Putin denied interfering in the U.S. election, and Trump has himself repeatedly denied collusion. And of course Trump has credited Kavanaugh's vehement denial of Christine Blasey Ford's accusations.

What are we to make of all these denials? Do we weigh them equally with the accusations?

Kavanaugh's testimony raised a related issue. He asserted several times, including his opening testimony, that everyone Ford alleged was at the gathering where she claims he assaulted her denies being there. But, except for Kavanaugh, the other alleged attendees didn't actually deny being there, only remembering being there. Nit-picking?

As law professors and economists (one of us teaches and writes on criminal law) we study exactly these issues. Something called Bayesian analysis tells us a great deal about these various denials.

First, the fairly obvious. MBS and Putin and Kavanaugh's denials are worth nothing if you believe that they would make the denial even if they were guilty. According to Bayesian statistics, you should update your beliefs toward “innocent” based upon the ratio of the probability of a denial for an innocent person to the probability of denial for a guilty person, symbolically $\text{Prob}\{\text{denial} \mid \text{innocent}\} / \text{Prob}\{\text{denial} \mid \text{guilty}\}$. If guilty people typically deny their guilt, then denial doesn't move the needle much. And, as with Saudi Arabia, guilty parties typically deny everything that they can.

This is one reason than defense attorneys don't put defendants on the stand. Although jurors don't implement Bayesian statistics formally, they have good instincts. Jurors expect that

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defendants will deny the accusation so little is gained from a denial. And there is the chance that in cross examination the juror will make some kind of admission. The admission would increase the chance of guilt because $\text{Prob}\{\text{admission} \mid \text{guilt}\}$ is much greater than $\text{Prob}\{\text{admission} \mid \text{innocent}\}$.

What though about a strong or vehement denial? Kavanaugh gave an impassioned and angry denial and Trump has emphasized that MBS initially gave a “very strong” denial. To be sure, this would be evidence if a guilty person were less apt to make a vehement denial. However, if such denials are more likely to be believed, then a guilty person will have ample incentive to make their denial exactly that way. A vehement denial is as apt to support guilt as innocence. Remember that Shakespeare wrote in Hamlet: “the lady doth protest too much, methinks”. Perhaps Kavanaugh did as well.

Accusations are not on equal footing with denials. The reason is that a guilty person is more likely to be accused than an innocent one.

As a lawyer, Kavanaugh no doubt understood all this. That is why he repeatedly asserted the denials of the two supposed attendees that had not been accused of wrong doing. These two, PJ Smyth and Leland Ingham, seem unlikely to falsely deny being at the gathering. This implies that actual denials by Smyth and Ingham, unlike denials by Kavanaugh and Mark Judge, would make Ford’s story fall apart.

But Smyth and Ingham did not deny attending the gathering. They simply said they did not recall being there.

One could honestly deny being there if one remembered being in Europe that summer, or never going near alcohol, or always staying away from Brett Kavanaugh and Mark Judge. But, simply not remembering an event is very different from denying it occurred. We were at many gatherings with a handful of friends in high school or college, but because that was 30-40 years ago, we specifically remember very few of these gatherings and could not list the attendees of any.

For a Bayesian statistician, the critical question is: What is the probability that a person would remember a given gathering that she attended 35 years ago if she did not observe anything notable occurring (remember we are not discussing Kavanaugh or Judge here). Our estimate is two-three percent, but to give Kavanaugh the benefit of the doubt, assume that the probability is ten percent. In that case, even if the gathering occurred, the chance is roughly 80% that 35 years later two attendees would not recall what for them was an unremarkable event.

If there were no gathering, there is a 100% chance they wouldn’t remember it, so the ratio of these two probabilities is 80% (technically this is called the “likelihood ratio”). Suppose that after Ford testified, but before knowing about Smyth and Ingham, you thought there was a 90% chance that the gathering occurred (the “prior” probability). The failure of two innocent people to remember the gathering should from a Bayesian perspective only deflate that prior probability

to roughly 72% (80% times 90%). In other words, if you believed Ford prior to hearing the Smyth and Ingham evidence, then their lack of memory should not shake that belief much.

In contrast if these people actually denied that the gathering occurred for reasons like those mentioned above, then the probability that the gathering occurred would be near zero assuming they are truthful.

Denial and not recalling are rough equivalents with regard to a gathering last night, but very different for an event 35 years ago.

If Kavanaugh understood the important difference between denial and lack of recall, then he committed perjury, by knowingly telling a falsehood when he misrepresented a lack of recall as a denial. It would in some ways be worse though if Kavanaugh didn't understand this difference and thought the two equivalent. That would mean he is a judge who fails to properly weigh different types of evidence and to understand the meaning of denials.

Denials by interested parties like MBS, Putin, and Kavanaugh mean very little. Denials by uninterested parties like Smyth and Ingham would mean a lot, though simply not remembering means little when there is ample time to forget.