Homework 5
Ling495

Robin Clark

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Due: December 10, 2018 by 5 pm

1. Hand in the homeworks to Nikita.
2. Neatness is good.
3. Avoid late homeworks at all costs!

Even the most honest person doesn't tell the truth 100% of the time and the most fluent liars don't say false things all the time. An honest person could be mistaken, might believe a falsehood due to self-deception, or might decide to tell a white lie for social reasons. A dishonest person usually lies for self-serving reasons, but will tell the truth if it serves his purposes.

Suppose that 90% of the population is of the honest type. They generally tell the truth; let's estimate 90% of the time, what they say is true, the rest being mostly mistaken beliefs and white lies. The rest of the population—10%, in fact—are given to deception. Still, they only lie about 20% of the time.

Suppose that you meet someone who you catch in a lie (although you say nothing to him about it). Calculate the posterior probability that that person is of the dishonest type.

Suppose, next, that the very same person gives you a piece of information which, if true, could benefit you if you act on it. Given your calculation above, calculate the posterior probability that what the person said is true.

On the last homework, we looked at a signaling game for irony—the case where the person said the opposite of what they meant. My intuition tells me that irony is different than deception; for example, a person using irony is not lying and a person who is lying is not using irony. That is, the type of individual that uses irony is different than the type of a deceiver. This suggests that different kinds of information are used to detect irony.

Let's suppose that speakers can come in multiple types. For example, θ_{irony} might be the type that employs irony and θ_{honest} might be the type for an honest speaker. Suppose that these two types can distribute independently so that $\text{Prob}(\theta_{\text{irony}} \;\&\; \theta_{\text{honest}}) = \text{Prob}(\theta_{\text{irony}}) \times \text{Prob}(\theta_{\text{honest}})$.

Let's further assume that honest speakers are distributed as above and that 20% of the population is inclined to use irony and they only do it 10% of the time. Suppose you've detected a false statement. Work out the posterior probabilities for the four combinations of types: honest and ironic; honest and non-ironic; dishonest and ironic; dishonest and non-ironic.

We saw that conversational implicature seemed to presuppose that speakers are unfailingly truthful. We now have a more nuanced account honest signaling. Clearly, I shouldn't draw implicatures from dishonest signals. Propose a method for sorting speakers into honest and dishonest types that would allow receivers to compute implicatures.