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**Lecture 07: Signaling & Counter-Signaling**

1. Signaling
   1. Signaling: conveying information using demonstrative actions
      1. Combats adverse selection
      2. By definition, signaling must be unspoken: merely telling someone that you are a good person does little. Talk is cheap.
      3. Ex: Bringing flowers to a date, listening, getting a college degree, dressing nicely, wedding rings, stock-piling weapons
2. Logic of Signaling
   1. Signaling is a particularly interesting because it’s so subtle and thus crops up in areas we wouldn’t normally expect. In some ways it is tremendously inefficient (people signal their wealth with a nice suit when they could prove their wealth with a bank statement). But yet we do it all the time and intuitively understand its rules.
      1. If you have the quality in question, the signal must be easy to send.
      2. If you lack the quality in question, the signal must be difficult to send.
      3. We thus have a *separating equilibrium*—senders of different types always choose different messages.
   2. Signaling is relative: it’s all about who sends the signal and who doesn’t. If everyone sends a positive signal, sending it doesn’t make you look good. But not sending it makes you look bad.
      1. Example: Social convention says that men pay for the first date. If the man doesn’t pay, he’s going to look bad but his date won’t think he’s special if he does pay.
3. Ordeals
   1. Consider economist Peter Leeson’s paper on ordeals.
      1. Medieval justice sometimes employed *iudicium Dei*, or the belief that God condemned the guilty and punished the wicked.
      2. They would put the accused through an “ordeal,” such as sticking their hand in boiling water. If the accused was innocent, God would protect their hand from being burned. If guilty, he would burn it normally.
      3. Many modern people think this is a horrible way to dispense justice. Leeson, however, argues that it makes sense.
   2. Understanding why requires remembering four facts:
      1. The people of Medieval Europe were really religious. They really believed God was dispensing justice through these ordeals.
      2. The ordeals were only used in difficult cases.
      3. The priests who administered them had control over the intensity of the ordeal (e.g. the heat of the water).
      4. A person could refuse to undergo an ordeal by confessing.
   3. Imagine a difficult case, one that is hard to prove with evidence. Leeson uses the example of an allegedly stolen beast. Suppose you’re accused and an ordeal has been ordered to assess your guilt.
      1. If you’re guilty, you fear the ordeal. You’ll burn your arm and pay the punishment. It would be better to settle with the farmer.
      2. If you’re innocent, you embrace the ordeal. You’ll come out unscathed and God will demonstrate your innocence.
   4. This separating equilibrium existed because…
      1. Priests had control over the ordeal and thus being willing to undergo them was a signal the person was innocent. So the water wasn’t that hot and the person wasn’t burned. A miracle! God has shown himself!
      2. Most people were religious and thus an ordeal was satisfying and believable. And since most people were religious, you probably were as well. So the priests knew you willing to undergo the ordeal was genuine.
      3. It was only used in difficult cases and thus there was no/little chance the results would be contradicted by new evidence.
4. Skeptics
   1. It would be strange if every ordeal ended in an acquittal so Leeson mathematically demonstrates it’s possible to create throw some folks under the bus—so to speak—without jeopardizing the innocent skeptics’s belief that the ordeal will exonerate them.
   2. A person can either be guilt (jg) or innocent (ji). Let:
      1. β is payoff if found guilty through ordeal;
      2. 0 is payoff if found innocent through ordeal;
      3. θ is payoff if confesses without ordeal (thus 0 < θ < β);
      4. p (0,1) is strength of belief that ordeals are Godly (think of it as probability)
      5. γ (0,1) is proportion of innocents that are falsely condemned.
   3. So jg will forgo the ordeal and confess if:
   4. And ji will undergo the ordeal if:
   5. Thus there exist a γ such that:
      1. This math is a little odd since β is actually negative; keep that in mind when you are multiplying by β and it’ll make sense.
   6. Since priest don’t like condemning innocent people (we assume), γ\* will be slightly greater than the right handed part of the inequality. He will find this value, Leeson argues, through trial and error.
5. Counter-signaling
   1. Signaling becomes doubly complicated when you introduce *counter-signaling*—when people shun a signal to show they are better than the people who rely on it.
      1. In reality, there’s a spectrum of quality instead of just good and bad.
      2. High quality people ignore signals medium quality people rely on. They instead focus on other signals to distinguish themselves from the mediums.
      3. “For Nash to deviate from convention is not as shocking as you might think. They were all prima donnas. If a mathematician was mediocre he had to toe the line and be conventional. If he was good, anything went.”   
          **-Z. Levinson, *A Beautiful Mind***
   2. Suppose there are three types of applicants for a job (good, average, and poor) and two ways of judging student quality (grades and recommendations). An applicant may submit grades, a recommendation, or both.
      1. Good applicants always have good grades and good recommendations
      2. Average applicants always have good grades with *either* good or bad recommendations. Average students don’t know if the recommendation is good or bad.
      3. Poor applicants always have poor grades and poor recommendations.
      4. If you are an average applicant, what do you submit?
      5. If you are a good applicant, what do you submit?
      6. Hence counter-signaling is sometimes called “too cool for school.”
   3. Applications
      1. Economist Tyler Cowen suggests to never read a book when the author adds Ph.D. (or other title) after her name.
      2. Don’t put irrelevant work experience on your resume.