

Dirty Harry proves the point

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The contributions of year's Nobel prize winners in economics can best be summarised by recalling Clint Eastwood's famous threat "Go ahead, make my day." This, he uttered while brandishing a gun to a criminal as Dirty Harry in *Sudden Impact*. Famously, the criminal releases his hostage and surrenders.

To understand the full appeal of that incident to a game theorist, one needs to put themselves in the shoes of the criminal. The criminal thought that, by taking a hostage and threatening her harm, Eastwood's character would back off. The problem is this, as a threat, was not credible. Eastwood convincingly demonstrated this to the criminal by himself credibly threatening to shoot the criminal should the threat be carried out. Thus, taking the hostage gave the criminal no power as to carry out the threat would be suicide.

A threat is only credible if the person doing the threatening will, when push comes to shove, actually carry it out. If not, say because the threat is just too costly to them, then the threat loses all power. The criminal's threat to kill the hostage was not credible precisely because Eastwood's threat was.

Of course, part of the pull of that famous line is precisely the fact that if you or I were to utter it, the result would likely be much different. No self-respecting criminal would believe with such certainty that I would happily shoot them even after they shot an anonymous hostage or at the very least have sufficient aim to do so. So there is a bit more uncertainty in the situation than dry game theory would predict.

Thomas Schelling and Robert Aumann, the recipients of this year's Nobel were among the first to really understand the importance of credibility in strategic situation. Schelling, whose work was born out of the arms race and the cold war, provided path-breaking analyses of bargaining and brinkmanship. He influenced a generation of military strategists ultimately on the risks of the nuclear build-up and the dangers of mutual deterrence. Put simply, building up arms while making use of those arms costly also creates risks due to the vagaries of human behaviour.

Schelling's work also influenced a later generation of business people on the importance of bringing competition to another level by making pre-emptive investments in capabilities, brand image and capacity. These notions are so ingrained in Business School teaching that Schelling's name is rarely mentioned or his original work read. But, for the discerning business person, his *Strategy of Conflict* is a must read.

But what happens when a good outcome requires trust but trusting isn't credible? Aumann had the answer here. If you intend to be dealing with someone on an on-going basis, trust can be established because the threat to withdraw trust if it is not honored

itself becomes credible. Put simply, taking advantage of someone's trust is a whole different equation if you are going to have to deal with them again.

The problem, of course, is how to establish trust when in an on-going relationship. Sometimes it happens and sometimes it doesn't. In game theory, we refer to this as the problem of multiple equilibria. From any starting point, many outcomes may be possible and the issue is how to get to the good ones as opposed to the bad.

Schelling worried about this too. He demonstrated that phenomena such as racial segregation could be a stark outcome from a few bad prejudiced seeds or very mild prejudice. Like butterflies causing hurricanes, he showed that a slight bias could aggregate up into 'macrobehaviour' that looked like extreme bias. But a mild push the other way and those small biases could be swamped.

His most famous example has proven one that mathematical game theorists have yet to model (even after almost half a century). Schelling asked his students (in New York): you need to meet a friend at 11am but don't know where, where will you go? Most of the class answered New York's Central Railway (under the clock tower). (By the way, for my students, it is the Flinder's Street steps; that is, once we get around the discussion of whether the whole problem matters these days with mobile phones!) In this example, Schelling introduced the notion of a focal point as the resolution to the problem of multiple outcomes. And a focal point being based in history, culture and a shared understanding is just not something capable of precise modeling. Maybe that is just as well.

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