Two-person games and the science of negotiation

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March is a lovely time of year — the weather is turning warmer and strikes are in the air.

Last Sunday I had already set out my set of khakis for the next day, in preparation for walking the picket line at Dalhousie University, only to learn that a tentative agreement had been reached between administration and faculty.

Hurray! I love my job, the teaching and the research, and I would have hated to disappoint my students. And on top of everything, th transit workers and the city reached a compromise as well.

The last few weeks have got me thinking about the science of negotiations, and what math has to say about how hard it is to come t agreement.

The first thing to realize is that everyone has their own scale for how they value things, whether they be tangibles like salary and benefits, or less tangible items like how the sides feel they are being treated.

The field of utility theory is based on the fact that there are no irrational desires — you like what you like, and value what you value. It's not so critical to the negotiations as to why the transit workers want rostering, but how much gain they attach to it. To each their own!

There are indeed mathematical ways proposed for estimating how much worth you place on things and events. What is crucial is to recognize this, on your part and your adversary's, and take it into account.

Negotiations are examples of what are called two-person games, even though there are often many more than two involved. There are inherent problems that arise when trying to come to an agreement in such a game.

For example, in most disputes, the worst outcome is a failure to agree, and the best outcome is for both sides to compromise. In the game of chicken, it is decidedly better to not compromise if your opponent does, and these stakes make the decision to reach agreement all the more unstable.

And if the joint outcome of not compromising is better than being left holding the bag, we have what is known as the Prisoner's Dilemma, where two rational players are led to the worst possible outcome. It leads to the breaking of contracts and intransigence in issues like global warming.

Game theorists work at how to unravel such thorny problems.

Mathematicians love the intrinsic difficulties that arise in contests. I have seen games where the best approach is to mimic what the other person does. This "Tweedledum-Tweedledee" strategy is precisely how to improve the outcome in repeated plays of the Prisoner's Dilemma. I have to say that I find that in arguments with my wife, mimicking her has not always turned out for the best.

There are other games where it is advantageous along the way to give more to your opponent, more than you have to, in order to ge more in the end. And sometimes it is best to throw deliberation to the wind and play randomly to keep your opponent guessing.

In the end, one of the things that mathematics excels at is in having different tacks for different problems. Whether it is sitting at a board game or around the negotiating table, sometimes all you need is one good idea to reach the endgame.

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