

Lecture One

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Introduction

The demand revelation procedure is one of the greatest inventions of the twentieth century. It is a system which can be used to get individuals to reveal their true preferences. It's used in auctions, internet advertising, and has many important applications.

Today, we'll study the history behind demand revelation, how Ed Clarke came up with it, and the challenges he faced. I will present an alternative model of innovation which captures some aspects of Clarke's experience. We'll conclude by asking: What can economics teach us about what it means to be human? Then we'll sink our teeth into the demand revelation procedure starting next week.

Syllabus Overview

This course will meet six times during the course of the semester. You will either be required to write three blogs with your own novel applications of the demand revelation procedure, or even better...hopefully you can get published in some computer science or economic journals. We can figure out which you'd prefer (blogs or essays) but I would like you guys to come up with some novel applications of the procedure. One of my ulterior motives is to spread the word about demand revelation, so I would like to see you guys get published.

Review of Economic Terms

In order to understand the demand revelation procedure, you don't actually have to know too much economic jargon. In fact, we only need to review two terms from economics, 1) The Free Rider Problem and 2) Public Goods

Q: Have any of you guys ever come across the free rider problem before?

Carl: I think I read about it in relation to patents...

Alex: I am in a class where the teacher makes participation 15-20% of the grade. Whenever you answer a question, you bear the costs (everyone in the class looks at you) but everyone benefits from your question.

Yes, those are excellent examples!

[I forgot to mention there is a very significant application of the VCG with regard to patents]

The **free rider problem** occurs when someone or a group/community is forced to bear more than their fair share of the costs for a resource.

How many of you have ever had to share a bathroom? I do. About eight of us share a bathroom. But only four of us clean it. The other four have a higher tolerance for uncleanliness. They know we have a lower tolerance; they know no matter what we will always clean it, so they have no incentive to do anything. Four people do nothing and reap the benefits of a clean bathroom, while the other four bear all the costs!

Another example would be pollution control. Say some of you live in McClean, Virginia, and some of you live in Charlottesville. In order to reduce pollution, McClean might pass gasoline taxes on its residents and make expenditures to reduce pollution. Pollution would decline and people in Charlottesville would be better off. Conditions might be so better off, that Charlottesville residents might not feel any need to reduce pollution on their part. Thus McClean would bear all the costs!

The free rider problem is a fairly straight forward concept. The only other term you need to know is **public good**. In its ideal form, a public good is **1) non-rivalrous** and **2) non-excludable**.

By **non rivalrous** we mean that your consumption of the good does not take away from anyone else's consumption of the good. For example, think about this classroom. There are plenty of empty seats. You're being enrolled in this class does not *exclude* any one else from participating in it.¹

* An important caveat. What if the classroom were full? And there were students who wanted to take the class. Then this class would no longer be a public good! Your presence would be excluding others. This highlights an important point: public goods are not rigid as we often think them to be. Whether something is non-rivalrous depends upon the number of people using it. This was pointed out by James Buchanan in a seminal paper titled *The Theory of Clubs*.²

Non Excludible: This means its hard for these goods to be priced by markets. Its either infeasible, inefficient, or perhaps impossible.

It is these criteria – non-rivalry and lack of pricing that define a public good.

Ed Clarke an Alternative Model of Innovation

¹ I got this example from Prof. Coppock

² I thank Prof. Coppock for teaching this to us all.

Ed Clarke was born in Richmond, Virginia. He is the inventor of the demand revelation procedure. He received his undergraduate degree in economics from Princeton, and was pursuing an MBA at the University of Chicago when he set out to solve the free rider problem. Many people, including Nobel laureate, Paul Samuelson had declared that it could *never* be solved. But Ed Clarke thought otherwise. He was able to develop the demand revelation procedure which could be used to get people to elicit their true preferences. It could be used to allocate costs for pollution control projects across communities. He had solved the free rider problem!

The problem however, was that no one would believe him. His insight was so counterintuitive, that nobody believed him! I interviewed one of his classmates, Prof. Tideman at V.a. Tech. Tideman told me initially he had trouble understanding what Ed was talking about. This is not because Ed is inarticulate; after you read his essays assigned for today, you will find that he is extremely articulate. The University of Chicago at that time was extremely conservative, and championed the free markets as solutions to everything. Ed's solution was out of the box, and showed that a government planner could achieve an outcome as efficient as the free market. This was not the type of solution that would be welcomed.

Anyhow, Ed should have received his PhD in 1967, but did not get it until the late 1970s! And after that he was not awarded the Nobel Prize *twice!* *He was never given the credit he deserves.* **THAT'S WHY THIS COURSE IS CALLED THE DEMAND REVOLUTION!** We have to help spread the word about Ed's invention, and help him get the credit he deserves.

Alternative Model of Innovation

How do we explain Ed's ordeal? Dean Radin has an interesting model which describes how scientists accept new ideas. Radin states, "in science, the acceptance of new ideas follows a predictable four stage sequence:

- In stage one, skeptics confidently proclaim that the idea is impossible because it violates the laws of science.
- In stage two, skeptics reluctantly conclude that the idea is possible, but not very interesting and that the effects are weak.
- In stage three, the main stream realizes that the idea is not only important but its more pervasive than previously imagined.
- In stage four, the very people who criticized it, claim they thought of it first!"

Prof. Trindle gave an extremely eloquent overview of Thomas Kuhn's concept of the paradigm. It was so eloquent I'm not sure I can do it justice: Paradigm is a somewhat vague concept. It refers to a prevailing mode of thought which excludes certain answers and only allows certain ones. I believe the example Prof. Trindle used was traditional physics versus quantum mechanics. Alex brought up the example of the heliocentric versus the earth centric universe.

Prof. Trindle pointed out an important weakness associated with paranormal phenomena.

Carl & Alex recognized some truth to this model:

Carl:

Yes in playing chess...I find that often you don't see a move and then later you realize that your opponent did have a good opportunity that you did not see before.

Alex: Arguing with your friends, sometimes they realize they were wrong.

In relation to the VCG, I believe many economists have realized the importance of Ed Clarke's discovery. However, many economists still don't know enough about it, and others write it off as "theoretical." Thus, I believe it is somewhere within phases two & three of Radin's model.

One of the goals of this course is to help further the transition from phase two to phase three and spread the Demand Revolution.

Conclusion:

What Economics Can be About....

If you pick up an elementary economics textbook, it will say that economics is positive—it merely describes what is, not what should be.

But isn't this contrary to creativity & innovation? Don't insights & discoveries come from out of the box thinking? Why limit your solution set to a particular system? In his autobiography, James Buchanan (the "father" of public choice) mentions how one of the keys to the "invention" of public choice was manipulating the rules of a system; not just operating within it.

Maybe economics shouldn't be about what *should be*, but it certainly can be about what *could be*.

What Economics Can Tell us About What it Means To Be Human

If you pick up an elementary economics textbook you will find the phrase *scarcity requires choice*. People have unlimited wants; desires, but resources are scarce. But the fact of the matter is, humans often make decisions by imposing an *artificial scarcity* on themselves. The simplest example of this would be self control. You can hog all you want i.e. eat three chocolate cakes in one sitting, or you can choose to eat a salad. I liked the example Alex gave. If you're wasting too much time playing computer games, then you can destroy the CDs! This involves imposing a constraint on yourself. Alex and Prof. Trindle also mentioned military leaders who burned their ships so the soldiers do not have the option to flee; all they can do is fight with everything they've got.

So all of these examples fit the following definition:

Scarcity does not require choice; choice requires scarcity.

Human beings make better decisions by imposing artificial scarcity upon themselves.

We'll pick up next week with the VCG mechanism; how it works; its limitations, strengths & weaknesses.

Additional Class Discussion

Carl:

What if there was no income tax?

What would that mean for public goods?

Alex:

What about people who buy hybrid cars...they are bearing all the costs, while everyone benefits from the pollution reduction. It would be interesting to research this

Prof. Trindle:

Yes, indeed...Honda has a more humble design in that its hybrid looks like a regular sedan. People will more likely buy Toyotas. Also you need to be considering tax law. You only get benefits if you itemize, and most people don't itemize.

Prof. Trindle: Getting fed up with the status quo, can lead people to change things. almost a moral/ethical impulse.