Chapter 12: Micromedical and Macromedical Perspectives

Economists make a distinction between microeconomics and macroeconomics: they call the large-scale, top-down approach macroeconomics and the small-scale, bottom-up approach microeconomics. Analogously, there are macromedical and micromedical views that we should understand.

Making Decisions

The Macromedical Way

The macromedical approach is familiar to most of us. A new drug, X, is tested on thousands of people and the results are statistically analyzed in an attempt to find true differences between X and a placebo. The therapeutic benefits are then judged against the risk of adverse events, considering the groups most likely to take Drug X. The FDA employs a macromedical view, generally considering the overall situation.

If Drug X is seen to be a positive addition, the FDA approves it. If not, the FDA rejects it.

The Micromedical Way

Patients, doctors, and other clinicians generally focus on the micromedical view, considering the health of one individual patient, because that's the mountain they need to summit. A physician takes all the data available and applies it to an individual patient. Therein lies both a problem and an opportunity.

What really matters to you, as an individual, is whether the drug you are about to take is safe and efficacious for *you*. The fact that a drug works for 40 percent of strangers increases the odds that it will work for you, but those odds are what you rely on *before* you put Drug X to the test; those odds help you decide whether or not to try Drug X. Once you do consume Drug X and resolve your conundrum, the success of those strangers becomes academic.

The micromedical approach focuses on the good of the individual in question and relies heavily on decision analysis, trial and error, and personal introspection. We've touched on some of the building blocks of decision analysis and will now put those pieces together.

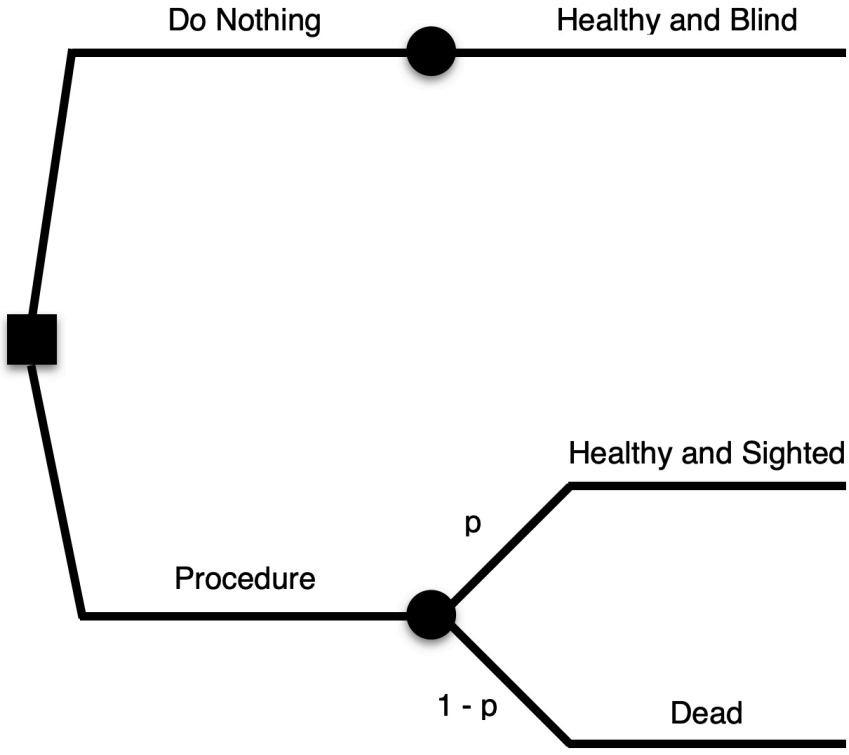
Decision Analysis

Decision analysis is the study of decision making within uncertain and sometimes risky situations—in other words, almost all situations.[1] For example, buying a house is an uncertain and risky venture. Things might turn out really well or you might rue the day that you signed on the dotted line. Decision analysis is forward-looking and relies on a clearly defined decision maker.

The following medical example from Stanford University's Ronald Howard demonstrates the micromedical/decision analysis approach.

Imagine that you are blind but otherwise healthy and are offered a free procedure—someone else will pay for it—that will leave you in one of two states: healthy with good vision or dead. The probability that you will end up healthy and sighted is *p* and the probability that you will die is 1 – *p*. At the moment, we don't know *p*, but it is a key factor in determining which alternative you will choose. How high must *p* be for you to accept the procedure? Fifty percent, 80 percent, 99 percent, or 99.9 percent?

Figure 1: Vision Procedure?



How high must *p* be to accept the procedure?

Two very reasonable, thoughtful people could give very different answers.

If one person's answer is 50 percent and another's is 99 percent, then the first person might happily join a clinical trial for some new, but risky, vision procedure to get a benefit quickly. The second person, however, might prefer to wait many years, until the procedure has matured through usage by numerous patients, and thereby reduce the risk. These two people face the same decision, but they have different preferences and may, therefore, take different paths.

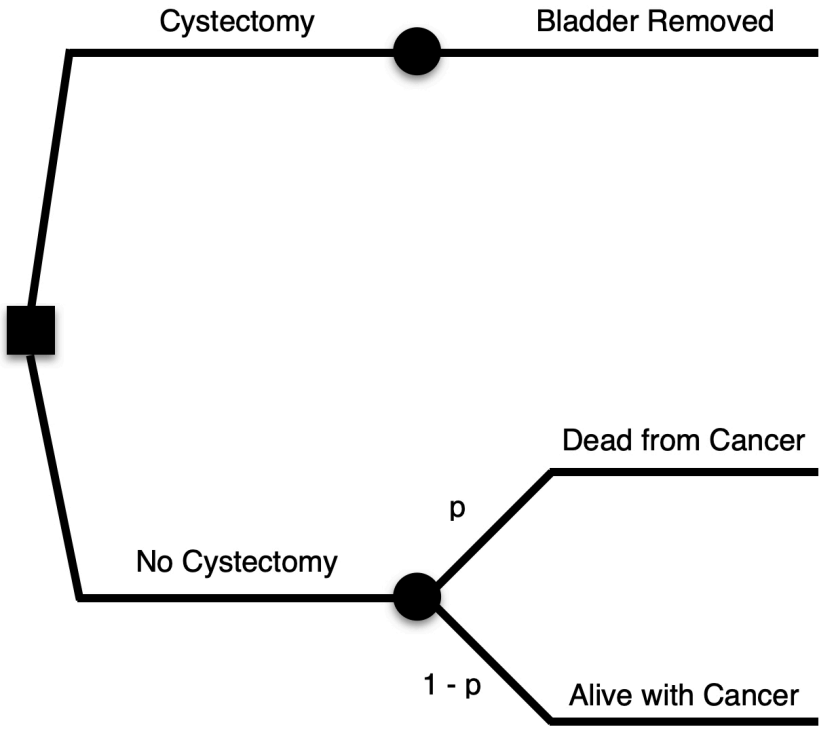
The square box on the left of Figure 1 represents a decision. You can do nothing or have the procedure. If you do nothing, you will remain healthy and blind. If you have the procedure, one of two things will happen: you will end up healthy and sighted or dead. The circle represents an uncertainty node. Once you pick the "Procedure" alternative, you will have a probability of p of ending up healthy and sighted and a probability of 1 - p (the two branch probabilities must add to 100 percent) of dying.

Here's another example, shown in Figure 2. You have bladder cancer and are not responding to the standard treatments. The normal next step is a cystectomy—a surgeon will remove your bladder. As part of that procedure, your surgeon will create a urinary diversion—a new way to store and expel urine. If you decide against the cystectomy, there's some chance your cancer will metastasize and kill you. Neither outcome is appealing.

The probability that the cancer will metastasize and kill you is p and the probability that it won't is $1 - p$. Again, we don't know p at the moment, but how high must p be for you to accept the cystectomy procedure? Twenty percent, 50 percent, or 80 percent?

People who would strongly prefer to skip the cystectomy and keep their bladder, even if it kills them, will require a high percentage, perhaps 80 percent to push them toward the Cystectomy alternative. People who are

Figure 2: Cystectomy?



How high must *p* be to accept the cystectomy?

willing to cope with the difficulties of living without a bladder and strongly want to live a longer life will require a lower probability, perhaps 10 or 20 percent, to push them toward the Cystectomy alternative. Again, these two people face the same decision, but they have different preferences and may, therefore, take different paths.

Preferences

There are two important points about preferences: first, they are often discovered more clearly via actions than statements; second, they aren't right or wrong—they just *are*.

Economists have noted that our preferences are revealed, not expressed. If you ask a 16-year-old girl whether she will ever have children, she might give you a confident-sounding yes or no. It will probably be something such as, "of course," or "no way!" However, if we check back in 15 or so years, we might be surprised at the actual result. People often find that they can't really appreciate a situation until they are actually faced with it. That 16-year-old has a limited appreciation of what's involved with having or not having children. None of us will ever exactly know what's involved until we *actually have* children, but those of us making the decision at 24 or 34 can much better estimate the tradeoffs and consequences than we could have at 16.

This "we can't know until we're there" can partly explain how every generation looks at the younger generation and asks how the world can survive with these lazy, selfish, self-centered, unaware, fill in the blank, _____, kids. But, of course, our parents' generation said that about us and our grandparents' generation said it about our parents, etc. "That kid, George Washington. He'll never amount to anything!" Let's face it—it's only when we get older and come face-to-face with the problems and opportunities of adulthood that we tend to grow up and act as adults. And that growth manifests itself by revealing some behaviors and preferences that we weren't aware of as children.

That means that we can't simply survey a representative sample of Americans and ask them what probability of success they would need to accept the vision surgery alternative described in Figure 1. Most Americans are *not* blind, and those who are know their answer needn't be authentic because the situation is hypothetical.

Further, preferences are not right or wrong—they just *are*. Because of this, it is problematic to judge a person based solely on his or her expressed or actualized preferences. As you've probably noticed, we humans do quite frequently make such judgments. To judge others is normal; we see that "those people" are different from us, and their different choices force us to