# Module 4: Heuristics - Anchoring and Adjustments

In the next few videos we're going to look more closely at examples of heuristics. Heuristics are these mental shortcuts or rules of thumb that we use when we're solving problems and making decisions and you will see how they critically influence our thought and decision-making. Specifically, we will discuss three heuristics in this course – anchoring and adjustment, availability, and representativeness.

Let's begin with a discussion on anchoring and adjustment. In many cases of decision-making, people estimate a solution by starting from an initial value that is then adjusted to yield a final answer. The initial value may be suggested by the framing of the problem or the result of a partial computation. In either case, adjustments are inadequate and biased towards the initial values. This phenomenon is called anchoring.

To illustrate this, let's do the following Math problem really quickly. You've got to do this in your head in about five seconds. I repeat, in your head in about five seconds. Ready? Ok, multiply the following numbers:

8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

What's your answer? 1000? 3000? When Kahneman and Tversky asked a group of high school students to estimate the above numerical expression within five seconds, the median estimate was 2,250.

Seems reasonable, isn't it?

Well, now let me give you a different Math problem. Now, you try and estimate the following product:

1 x 2 x 3 x 4 x 5 x 6 x 7 x 8

Now, what's your answer? Again, when Kahneman and Tversky asked another group of high school students to estimate the above numerical expression within five seconds, the median estimate was 512.

So, two observations follow from this experiment. The less interesting observation is that people, in general, get the answer to this question really, really wrong. For both expressions, the answer is 40,320. So, people are off the right estimate by an order of magnitude. The more interesting observation is that people give different answers to
the two problems, even though they're different presentations of the exact same question, the first is a descending sequence of numbers while the second is an ascending sequence.

So, why do we give completely different answers when the same problem is presented differently? First, note that this is an instance of fast thinking. When people have lots of time to compute such an expression, they will get the exact product. However, in thinking fast and rapidly answering such questions, people may perform a few steps of computation, that is estimate the product of the first 2 or 3 numbers, and estimate the product by extrapolation or adjustment. Because adjustments are typically insufficient, this procedure should lead to underestimation. But the magnitude of underestimation varies in the two cases because the anchoring is different in each case. In the first case of the descending sequence, you multiply 8 times 7, and get 56. You then multiply that by 6 and then get a little over 300. You're at this point guessing that the final number's got to be pretty big, bigger than 300, like maybe 2000 or so. In the second case of the ascending sequence, you start with 1 times 2 and 2 times 3 is only 6. So, in extrapolating, you think the answer is going to be pretty small, maybe only like 500 or so. That is, because of the result of the first few steps of multiplication (performed from left to right) is higher in the descending sequence than in the ascending sequence, the former expression is larger than the latter. The first number we see when we do our estimation is the anchor. And once we dock the anchor in our head, we adjust as needed from there but inadequately. Starting at different points or anchors leads is to different estimates.

What is even more interesting is that the anchoring effect can be observed even for anchors that are totally arbitrary. In a demonstration of such an anchoring effect, Kahneman and Tversky asked people to estimate various quantities, stated in percentages. Examples of such questions included the percentage of African countries in the United Nations. For each quantity, a number between 0 and 100 was determined by spinning a wheel of fortune in the subjects' presence. The subjects were instructed to indicate first whether that number was higher or lower than the value of the quantity, and then to estimate the value of the quantity by moving upward or downward from the given number. Different groups were given different numbers for each quantity, and these arbitrary numbers had a marked effect on estimates. For example, the median estimates of the percentage of African countries in the United Nations were 25 and 45 for groups that received I0 and 65, respectively, as starting points. Payoffs for accuracy did not reduce this anchoring effect.

In a similar experiment, Dan Ariely and his colleagues had people pen down the last two digits of their social security number. They were then asked whether they would pay that amount in dollars for a fancy bottle of wine. Ariely and his colleagues found that people in the highest quintile of social security numbers were willing to pay 3-4 times as much for the exact same good. A large anchor significantly increased their willingness to pay.

Anchoring and adjustment have widespread effects in business. Anchoring plays an important role in how we understand and assess prices by changing the value we
ascribe to different objects. In that sense, it is an important tool for price-setting firms as they determine the range of prices for their products and how those prices will be perceived by customers. Firms often set a high anchor price and then subsequently reduce price to increase perception of a bargain and increase consumer demand.

In negotiations, anchoring is used to launch negotiations from an advantageous statement of value, irrespective of whether the position is rational or arbitrary. Opening offers are anchors that have the psychological effect of framing what each side will view as the possible outcomes in the ensuing negotiation.

Studies have also shown that relative to "do your best" conditions, employees in high anchor conditions select higher performance goals and demonstrate greater performance increases. Beyond these economic choices and effects, anchoring has a powerful impact on everyday choices and decisions that we make such as the choices we accord our kids, our life expectancy estimates, our assessment of partners, all of which improve our life satisfaction and happiness.

So, the next time, you are trying to make a decision, consider whether anchoring and adjustment are possibly impacting your choices. Have you explored the full option set? Have you tried to imagine another extreme anchor? In brief, are you considering all information and options or are you basing your selection on an anchor? The answers to these questions will lead you to possibly more effective and efficacious decisions.