PRINCIPLES OF BEHAVIORAL ECONOMICS

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Week 50

Lecture 50

Thank you. Hello everyone, this is Lecture 50 of the course on Principles of Behavioral Economics. We are discussing intertemporal choice models and have nearly finished covering the major works in this field by both neoclassical and behavioral economists. Of course, given the scope of the course, we cannot detail each one of them extensively. Nevertheless, the basic ideas have been presented. Now, in this module, we will discuss some special discounting cases.

The concepts we will cover are 'choosing not to choose' and 'preferences over profile.' This is a feature of human behavior where we sometimes choose not to choose, meaning we take action to prevent ourselves from taking certain actions. For instance, if I struggle to save, I might opt for an auto-deduction from my account, which goes into recurring deposits or systematic investment plans. I am required to set aside or maintain a certain balance in my account so that the money can be auto-debited monthly.

This is how I force myself to save money for the future. I must be careful to spend wisely, ensuring I leave enough in my account so that when the auto-debit occurs, there is no default. This is an example of choosing not to choose. As recounted by Homer, Ulysses famously allowed himself to be tied to the mast of his ship so that he could listen to the sweet but seductive song of the sirens without risking doing anything foolish.

So again, another example of choosing not to choose. Most of us are willing to pay a premium to buy snacks in small packages, soft drinks from overpriced vending machines, and beer in small quantities. Though we know that we could save money by buying in bulk, we fear that doing so would lead to overindulgence, leaving us overfed, drunk, and no better off financially. In a well-known study about procrastination, and pre-commitment, executive education students were allowed to set their own deadlines for three required papers.

At the beginning of the term, almost three-quarters—that is, 73%—set deadlines that fell before the last week of class, even though they knew missed deadlines would lead to lower grades. Apparently, the students were so afraid they would not get the work done without deadlines and external penalties that they were willing to take the risk. This kind of behavior is theoretically puzzling. From the point of view of exponential discounting, choosing not to choose makes no sense. According to this model, if you do not want to indulge now, you will not want to indulge later either.

But such behavior is not obviously entailed by the hyperbolic discounting model either. If you discount your future hyperbolically, you may very well plan not to overindulge but then overindulge anyway. Now, we can give an example of such a situation. Self-control and time preferences as given by or discussed by Thaler in his famous book Misbehaving as well as the book by Thaler and Sunstein, Nudge. Thaler was hosting dinner for some guests and put out a large bowl of cashew nuts to nibble on with the first bottle of wine.

Within a few minutes it became clear that the bowl of nuts was going to be consumed in its entirety and that the guests might lack sufficient appetite to enjoy all the food that was to follow. Leaping into action, Thaler grabbed the bowl of nuts and removed the bowl to the kitchen where it was put out of sight. Now, imagine the following conversation between a human who just removed a bowl of cashews with an Econ looking on. Econ would say, why did you remove the cashews?

Human would say, because I did not want to eat any more of them. Econ would say, if you did not want to eat any more nuts, then why go to the trouble of removing them? You could have simply acted on your preferences and stopped eating. This is what rational individuals should do, that if I do not want to do it, I would not do it. But the problem is that maybe we end up doing certain things, even though we understand that doing such things are not really the best thing for us to do.

Then human says that I removed the bowl of cashews, because if the nuts were still available, you would have eaten more. And then Econ says, in that case, you prefer to eat more cashews. So removing them was stupid. So basically, if the bowl of cashews is in front of you and you are eating from it, then a rational decision maker would think that eating is preferred.

That's the choice. That's what makes you better off. Then why should you remove it? So basically, whatever you are doing as the theory of preference say that this is basically the reflection of your preferences.

Your choice is a reflection of your preference, and that must be giving you the maximum possible utility, which is why you are supposed to do it. So if you do not want to do it, do not eat, and there is no need to remove the bowl. If you want to eat, then eat; why remove the bowl? So these are basically the differences in the thought processes, as probably exemplified or explained through the discounted utility model. Now, however, in reality, Thaler's guests were happy and they thanked him.

In economics, the basic principle is that you can never be made worse off by having more options because you can always turn them down. So having the bowl of cashews was an additional option. Removing it cannot make you better off. Before they removed the nuts, the group had the choice of whether to eat the nuts or not. Now they don't.

So, of course, they are worse off. In the land of Econs, it is against the law to be happy about this. But then, if individuals—the individual who removed the cashews—that is an act of choosing not to choose. You decide to do something, to take a step so that you do not end up choosing the option which apparently seems lucrative to you but may not be the best, taking into future possibilities into consideration.

So, none of the models we have explored so far is appropriate for capturing common behaviors like this. Behavioral economists approach the issue by drawing a distinction between naive and sophisticated hyperbolic discounters. When people are time-inconsistent—meaning they prefer X to Y ahead of time but Y to X when the time arrives—they are said to have self-control problems. Exactly the kind of problem we discussed at the end of the previous module, when the person was considering whether to eat a red velvet cake or not. Naive time-inconsistent individuals, at times are also called naifs for short, are unaware of their self-control problems.

Naifs make their choices based on the inaccurate assumption that their future preferences will be identical to their current preferences. So, exactly in the example of the bowl of cashew nuts, The individuals who were consuming the cashews were naive, time-inconsistent individuals. Now they are enjoying it, not having any control over it. But then when the time will come for the other courses of the meal, they will find that their appetite is being killed and they will not be able to enjoy much of the rest of the meal.

Sophisticated time inconsistent individuals or in short, sophisticates are aware of their self-control problems. Sophisticates make their choices based on accurate predictions of their future behavior. And accordingly, they might not do such things as the naifs would do.

Now an example might help. It is October and you want to save for presents for the upcoming holiday season.

you know that saving in October and November allows you to get some really nice presents for your loved ones in December saving is not a fun but your utility stream from saving is 3-3-27 that is when you save in October you get a utility of 3 when you save again in November you get a utility of 3 but when in December you are able to buy nice presents for your relatives then you get a very high utility of 27. That is when you spend in December, that utility is very high.

So this utility streams 3- 3 - 27 ends on a high note when friends and family open their presents and love you again. You can also save in October, splurge in November and still end up with decent presents in December for utilities stream of 3, 9 and 15. So, here you are saving in October, but you fail to save in November. So, there the utility is 9 and what you can buy in December is somewhat good, but not the best. So, that is why the utility is 15.

Finally, the third option is that you can spend and spend. So, you are not saving either in October or in November. Your utility are 6, 6 and 9. when you buy something in December, you are not actually left with much money. So, the presents are not really that good.

So, your utility is just 9 from that expenditure. Let us first assume that you are an exponential discounter with delta equals to 1. That is a simplistic assumption made just to ease the calculations. The options that you have are First of all, this is in October.

Save, save and of course, in December, you spend. So, your total utility is 3 plus 3 plus 27. See, if we had some other value of delta, say delta equals to half, then we would be having 3 plus half into 3 plus half square into 3, right, into 27. So, this is how you would have calculated. We are not actually much bothered about these calculations and that is why delta equals to 1 is assumed.

Now, the second option is that you save in October, spend in November and buy gifts in December. So, 3 plus 9 plus 15 equals 27. And the third option is you spend. In October, spend in November, and buy not a great gift in December. So, 6 plus 6 plus 9 equals 21.

As you can see, 33 is the largest utility. So, you choose to save in October as well as November. Let us now consider the possibility that you are a quasi-hyperbolic discounter with again delta equals 1. But now I have another discount factor, which is beta. And let us set it equal to 1 by 3.

So in October, again, your options are: save in October and November, then buy. So, 3 plus 1. 1 by 3 multiplied by 1 upon 3 multiplied by 3 plus 1 upon 3 multiplied by 27, delta equals 1. So, we do not need to consider delta, then delta squared, and so on. So, that is why 3 plus 27 multiplied by 1 upon 3, that makes it a total of 13.

Alternatively, you save and spend, you have a utility of 11. The third alternative, you spend in both months, the utility is 11. again 13 is greater than 11 11 so you choose to save so for so good the problem is that having saved in October you may be tempted to splurge in November so what happens When November comes, you can continue to save in November and enjoy the expected 327 utility stream or you can spend in which case you get 915. What happens when November arrives?

The exponential discounter being time consistent would of course continue to save. We can calculate that in November when you save. your utility is 3 plus 27 equals to 30 and you spend in November your utilities are 9 plus 15 equals to 24 30 being greater than 24 of course you save a hyperbolic discounter however would spend because in November when he saves then and spends in December his utility is 3 plus 1 by 3 into 27 which is 12 and if he spends in November then 9 plus 1 by 3

into 15 that gives us 14 so 14 greater than 12 makes him splurge in November he is time inconsistent that is come November there is no way the hyperbolic discounter would stay on the save save path charted in october an unsophisticated or naive hyperbolic discounter is unable to anticipate his future behavior thus he will get on the wagon or in october choose save save but fall off it and splurge in november In spite of the very best intentions, therefore, he will end up with save-spend combination. A sophisticated hyperbolic discounter is able to anticipate her behavior and knows in October that save-save is not going to happen.

So he will do something in order to ensure that he must not splurge in November. So this is like choosing not to choose. Having eliminated save-save from her menu, the sophisticated might as well spend-spend since she is indifferent between the remaining two options. This is bad news not only for the hyperbolic discounter but also for purveyors of expensive goods.

If customers are unable to save for the fancy stuff, nobody will be able to sell it. So it is also in the interest of the marketers to ensure that customers save enough to buy fancy, expensive gifts in December. Department stores and other sellers therefore have every incentive to offer a layaway plan: For a small administrative fee of, say, one, payable in

October, stores will hold onto consumers' savings in November so as to make spending them then impossible.

The fact that department stores offer a layaway plan does not eliminate any of the other options available in October. It merely adds one with the utility stream of, say, 2, 3, 27. Now, you are paying a small amount in October. That is why your utility is now 2 in October. 3, you are not spending in November.

So, it is still 3, and you are spending in December. So, 27. So, this is a fourth option that is coming into the picture. No exponential discounter would choose layaway since in October, a layaway would give him 32. Now, you remember it was 33 when he had this save-save option.

So, this is actually inferior to his original idea and he is anyway going to stick to his idea. So, it is not needed by him. He does not go for it. He sticks to his save save and then spent path. For our hyperbolic discounter, the discounted utility would be from layaway 2 multiplied by

1 plus 1 upon 3 into 3 plus 27 and this is 12 which is less than his save save idea and as a result of which the unsophisticated hyperbolic discounter who evaluates the options available in October without consideration of whether he can stick to the plan in November will note that save save looks better than layaway and choose save save in October fall off the wagon in November and end up with save-spend idea or path. The sophisticated hyperbolic discounter who eliminates save-save from her menu

knowing that she will be unable to stick to it finds that layaway beats both save spend and spend spend because if you remember hyperbolic or quasi hyperbolic discounters utility from save spend and spend spend both were at 11 but from layaway it is 12 so he would be opting for the layaway offer she signs up for the layaway plan is prevented from splurging in November and gets the nice presents in December Notice that the introduction of layaway although inferior to save-save in terms of utilities actually helps the sophisticated hyperbolic discounter to do better than she would have done otherwise. The next thing that we talk about is preferences over profiles.

The model of hyperbolic discounting especially when augmented with the story about naiffs and sophisticates can capture a number of phenomena that are simply inconsistent with the model of exponential discounting. Yet, there are many conditions under which both exponential and hyperbolic discounting fail to accurately capture people's actual

behavior. The following exercise makes this clear. So, now we are going to give an example where we would show that the outcome from both kinds of discounting mechanisms, exponential as well as quasi-hyperbolic,

would result in the same outcome. So this is what we call preferences over profiles, in the sense that some people have certain strong preferences for certain profiles. So their preferences are driven by those profiles, regardless of what kind of discounter they are. The example is called cleaning the house. It is Sunday morning.

So that is time period t. Morning is that time period t equals 0. And you are determined to accomplish two things today. Cleaning the apartment and going to the movies. You can either clean during the morning, which is t equals 0, and go to the movies during the afternoon, which is t equals 1. Or go to the movies during the morning, then t equals 0, and clean in the afternoon when t equals 1.

So now the two time periods are today itself, but one in the morning and another in the afternoon. You hate cleaning. It only gives you a utility of 2. You love the movies. It gives you as much as 12.

Assume that you discount the future exponentially with delta equals to half. From the point of view of t equals to 0, what is the utility of cleaning first and going to the movies later? So, if you clean first, your utility is 2 and you are going to the movie later. So, delta multiplied by 12, there is only 2 periods. Current no discount.

Afternoon there is one discount. So 2 plus half multiplied by 12 gives you 8. What is the utility of going to the movies first and cleaning later? So you first go to the movie and then clean. The total utility is 13.

You decide to go for the movie first. Next assume that you discount the future quasi hyperbolically. Therefore, your values are beta equals to 1 upon 3 and delta equals to again half. From the point of view of t equals to 0, what is the utility of cleaning first and going to the movies later? So, now 2 plus beta alpha multiplied by 12 gives you 4.

What is the utility of going to the movies first and cleaning later? So, 12 plus beta alpha multiplied by 2 gives you 12.33. So, again, 12.33 is much greater than 4. You decide to go to the movie first. What this exercise suggests is that whether you discount the future exponentially or hyperbolically, you will always schedule the pleasant experience first and the unpleasant one later.

This is what is called preferences over profiles. This implication contrasts sharply with people's observed behavior. Personal experience suggests that when choosing between sequences of events, people will make a point of scheduling the unpleasant experience first and the pleasant one later. We must try to make the latter part of the journey better than the first.

So long as we are en route, as the ancient Greek philosopher Epicurus said. In this case, personal experience and ancient wisdom are supported by evidence. In one study, researchers presented people with verbal descriptions and graphical representations of increasing and decreasing salary profiles and elicited preferences over the profiles. The authors concluded that, all things equal, by and large, A large majority of workers prefer increasing wedge profiles over flat or decreasing ones.

This is something we mentioned in the previous modules as well. People often save the best for last. Perhaps they want to end on a high note or hope to get the unpleasant experience over with. Or they rely on the prospect of a pleasant experience to motivate themselves to take care of the unpleasant one. Such a preference for increasing utility profiles could, in principle, be captured by relaxing the assumption that delta is less than 1.

If delta exceeds 1, a rational discounter will postpone pleasant events as much as possible. Now see that when delta is greater than 1, Then for future periods when I have delta squared, delta cubed, delta raised to the power of 4, these numbers actually increase over time. So instead of discounting the future, you are actually expressing increasing preferences for the future. But when delta is greater than 1, then r should be less than 1 because, as you know, delta equals 1 plus r or 1 plus rho.

So, if this is greater than 1, then r has to be less than 0, which is why the resulting preference is called negative time preference. Yet, this solution is awkward—the solution of the example we presented—because people actually brought forward the thing they liked the most. This contradicts the evidence that exists in large numbers in the literature. Because the very same people who clean in the morning and go to the movie in the afternoon simultaneously discount the future with delta less than 1 and r greater than 0—that is, they exhibit positive time preference in other contexts.

So in some contexts they exhibit negative time preference, and in some contexts they exhibit positive time preferences. In addition, there is evidence that people also exhibit preferences for spread. That is, people sometimes like to distribute multiple desirable

events over time. While some children eat all their Halloween candy in one sitting, others prefer to distribute the eating evenly over days or weeks. This kind of preference cannot be accounted for by either positive or negative time preference, at least on its own.

Finally, people often exhibit a preference for variation over time as they avoid choosing to consume the same good over and over again. As a result, people diversify over time. They wish to distribute pleasant and unpleasant events over time, and they value variety. All this suggests that people have preferences over profiles.

They care about the shape of the utility stream as well as about discounted individual utilities. Ideally, what it tries to say is that for many instances, we might not have a typical answer or solution to the evidence we get. For example, alternatively, we can say that certain things exist which are neither explained by the exponential discounting model nor by the behavioral counterpart, that is, either hyperbolic discounting or quasi-hyperbolic discounting. So, we need to bring in different other dimensions, other psychological factors that might help us explain such behavior.

So, choosing not to choose and preferences over profiles are two such instances which are not exactly explained by the so called models they display certain behaviors which are beyond these models. So with this, I conclude this module on certain kinds of discounting that, as I mentioned, are not generally explained by the models we have talked about so far. And with this, I also conclude this discussion or the topic of intertemporal choice models. Next, we are going to begin with strategic interaction.

Thank you.