[SQUEAKING]

[RUSTLING]

[CLICKING]

FRANK SCHILBACH: So the quizzes are not meant to be difficult. They're mostly meant to provide some incentives for you to, A, keep up with the class, B, to do the reading, C, to come to class. Are they actually a commitment device or not? Yes?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: In general, are the quizzes a commitment device or not by the definition that we had?

AUDIENCE: Yes.

FRANK SCHILBACH: Why is that?

AUDIENCE: Because we [INAUDIBLE].

FRANK SCHILBACH: Right. But I guess one condition that we have in the commitment device-- and that's more like a question of definition-- is like it's chosen by the agent to actually engage in this, and I guess you don't have the choice.

So in some sense, if I offer to you to choose quizzes versus not and you could particularly only do worse by doing the quizzes, I could offer you the choice either you'd always get 5 on the quizzes, or you can opt into saying you do the quizzes, then you choosing the quizzes would very much be a commitment device. But if I sort of just impose it on you, then, strictly speaking, it is not, even though it sort of functions in the exact same way as if you had chosen it.

OK. Mostly we are discussing empirical questions related to hyperbolic or quasi-hyperbolic discounting. I want to have a short intermezzo very briefly about sort of telling you about how to solve problems with quasi-hyperbolic discounting in part because that's relevant to the problems set. I already talked with you briefly about how do you deal with fully naive agents and how do you deal with fully sophisticated agents. In some sense, it's fairly simple in these two cases, in part because these are special extreme cases.

Now, the third case is, what do you do when you have a partially naive decision-maker? And that's a little trickier, and we tend to not have that many problems related to partially naive decision-makers. [INAUDIBLE] is a little tricky to do. So essentially, what you do is you kind of do the same as you do for the fully sophisticated decision-maker. You do start by doing backwards induction. You essentially solve for what does the person think they're going to do in the future.

For that-- I'm speechless. For that, what do you do is you use people's beta hat, and beta hat is essentially what the person believes they will do in the future. And then, essentially, solve using backwards induction what the person thinks they will do. This is the exact same thing as you do for a sophisticated person, except for that you're using now people's beta hat as opposed to people's actual beta. The difference is, of course, it's always the beta hat. It just happens to be for the sophisticated person that the beta hat actually is the beta.

So then, essentially, you start at the end. You do backwards induction. You go back in time, work yourself [INAUDIBLE] period two, so then the person using the beta hat knows what they're going to do in the future, thinks they know what they're going to do in the future starting in the next period.

Then you're going to start solving for the first period, like what is the person actually going to do? For that, what you need is the person's actual beta because that's essentially what determines people's actual choices. And then you go to the next period and do exactly the same thing. Again, you do sort of backwards induction. You already have solved that from the previous step.

But then, essentially, in period two, then, the person actually uses again their actual beta for making their decisions. So the beta hats are guiding people's beliefs about what they think they will do in the future, but then you have to go back and actually look at what does the person actually do. And that often differs, in particular when you get to like period two, three, and four in the future.

Sorry, this is not-- The second thing I wanted to say is-- and this is mostly relevant for problem set two. So far, we have essentially looked at continuous choices. It's like going to a movie versus not, or at some point you have like one movie that you can go to which essentially is sort of following the O'Donaghue-Rabin papers and examples. You have one problem set you need to do at some point. This is essentially a discrete choice. Do you do it, or do you not do it?

Of course, many choices in life so exactly like that, like, essentially, when do you do the problem sets and so on and so forth, but other choices in life are continuous consumption savings or continuous choices. It's about like how much do you eat, how much do you consume, and so on and so forth.

And sort of the canonical thing to do in economics are consumption savings choices. You have some amount of money. You think about how much should you consume in this period, how much should you save. There's an interest rate. You're going to get more money than in the future if you save more and so on and so forth.

The same principles here apply as well except for now you're not comparing discrete choices, but now you do, essentially, [INAUDIBLE] conditions the same what would you do in any optimization problem as you would do in 1401 or one or any sort of intro micro class where, essentially, you optimize using [INAUDIBLE] conditions, et cetera, subject to some budget constraint.

In the recitation, you get some additional guidance how to do that, and particularly, the TAs will walk you through a previous problem from like a few years ago that essentially is sort of doing exactly that. I just want to sort of flag this so you're not surprised. This is essentially sort of 1401 basics that we discussed in the first recitation. There's also some handout on some refreshers for that, but that'll come as well.

But the same principles apply here. That's exactly the same thing as we do here in the other choices that people make except for now we have, essentially, continuous choices. Any questions on this?

OK. All right. So then we're going to talk about other applications, starting with credit card teaser rates or credit card behavior. This is an old paper by Ausubel [INAUDIBLE]. You can have any concerns about it, but in some sense, it's sort of nicely illustrates very simple behaviors that are very nicely fitting into the quasi-hyperbolic discounting model.

So this is evidence from using real-world credit card usage. So essentially, there's a company who has a bunch of data on credit card usages, and as you might be aware, credit card companies send out all sorts of mailers about getting people to sign up for a credit card. In particular, once you're out of school and gainfully employed, you get all sorts of mailings and so on asking you to sign up for credit cards.

Now, in this particular example, the company mailed out randomized credit card offers of the following types. There was like a standard credit card offer, which was a 6.9% interest rate for six months and 16% afterwards, so there's already, in some sense, a teaser rate built-in in the sense it's starting to be looks like it's really cheap. You might sort of think, oh, I'm going to just bar for a month, and then eventually, it gets more expensive. The hope of the company, of course, is that you keep borrowing from them once it actually gets more expensive.

And then there's two randomized conditions. There's what they call the teaser deal, which is 4.9% followed by 16%, and then there's what they call the post-teaser deal, which is 6.9% followed by 4%. Notice that if you borrow a given amount for quite a while and that these two conditions are pretty much similar, depending a little bit how long you borrow, if you borrow for something like a year, then it's about similar or the same. If you borrow for more than a year, then you know option three is probably better than option two for you for a given amount that you borrow.

But what the company then has is response rate and people's 20-month borrowing history for individuals who take up the card. Now, these are kind of selected, so you want to be a little bit careful how to interpret that. But the response rates surely are the right thing to look at because they'd be randomized across people who read which letter.

What they find is that the response rate is about 2.5 times larger increase in take-up in the second relative to the third group. Now, given subsequent borrowing behavior-- and that's kind of endogenous. You want to be a little bit careful with that.

But essentially, if you look at people's behavior, the latter is a much better deal. So you'd much rather have-- as I said, you'd much rather have like deal number three compared to deal number two. And particularly, if you borrow for, say, two years like $1,000, you're going to pay much more interest in deal number two compared to number three. Yes?

Now how do we think about this from the quasi-hyperbolic discounting model? How do we explain this behavior? Yes?

AUDIENCE: [INAUDIBLE] the one with the [INAUDIBLE].

FRANK SCHILBACH: Yeah, exactly. So let me just repeat what you said. So you said, people think they will not borrow in the future, or they're like, I'm going to borrow for a while. I'm going to borrow for a few months. I just need some money right now.

In the future, surely I'll be patient. I'll pay everything back, and so it doesn't really matter what the interest rate is after six months. Therefore I'm just going to optimize according to the six-month period that I see. The third deal is cheaper than the second, so let me just pick that.

And then so, surprise, people actually then keep borrowing, and it ends up being a lot more expensive than it is. That's exactly right. That's what I have here as well. Now, if people are sophisticated, why would they choose option two? Yes?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: So there's sort of the idea that, essentially, if you don't like your future self to borrow, you might want to actually choose a high interest rate to protect you from doing that. Now, that's a very sophisticated type of behavior. My guess is, at the end of the day, that will not be particularly successful because, at the end of the day, the 2% difference is probably not making a huge difference.

But in principle, the data are sort of consistent with that. We cannot rule this out. Now, there's other issues with like substitution to other cards and so on, so you might sort of-- that might backfire in various other ways, but in principle, at least, that's exactly right.

Now, what evidence can be collect to separate these stories? I show you this data from the paper that they have. Now, as I'm telling you, I can't really disentangle these stories because there's no other data available. But what other data would you want to know, would you like to collect to sort of disentangle from these two stories or disentangle these two stories? Yes?

AUDIENCE: Whether people continued borrowing.

FRANK SCHILBACH: So you could look at their boring behavior, and then what would you conclude, or what data-- what would you--

AUDIENCE: So if they stopped borrowing, that would imply they are sophisticated and they continue [INAUDIBLE].

FRANK SCHILBACH: Yes. I think a little inconclusive in some sense, but yes, I think that's right. What else can we collect? Yes?

AUDIENCE: [INAUDIBLE].

FRANK SCHILBACH: Yes, exactly. So if you ask people, what do you think you're going to do, that would be helpful. And then in some ways, it will also be nice to have some form of like demand for commitment. We don't quite have this here because neither of these options is actually dominated. You could sort of tell stories either way.

But once you have a dominated option, the naive person would not pick that anymore. I think it's also right that looking at people's borrowing behavior-- we can also learn from that in some sense. It can't be that you keep doing stuff that's bad for you if you're really sophisticated. Sorry.

So two things I think that you can potentially collect clearcut evidence to rule stuff out is, one, collect beliefs about for borrowing behavior. So there's one very nice paper, a recent paper by Hunt Allcott, and Dmitry Taubinsky, and co-authors that looks at payday borrowers. This is like payday lending at really extremely high interest rates where people essentially borrow against their future paycheck, and they keep doing this over and over again.

And what they do there-- they actually elicit people's beliefs and say, what do you think is the probability that you're going to borrow again? You can ask several people and then, essentially, just look at what are the actual beliefs-- sorry, what are the actual borrowing rates, about what fraction of people are actually borrowing again compared to the perceived fraction.

And what they find, in fact, is payday borrowers seem to be quite sophisticated. So these are people who actually know, I'm going to like borrow again in two weeks from now and so on, and I'm going to roll it over and over again. Now, they also find that that is more common among repeat borrowers, so like somebody who has like rolled his over five times-- they actually don't have a lot of illusions of what they're going to do in the future. They know they're going to roll it over again.

When you look at people who are like first-time or second-time borrowers, things are different. There people tend to think, I'm going to do this only once or twice, and then they sort of surprised themselves by borrowing again. That's consistent with some story of learning in a sense of they can't really necessarily nail that, but I think they find, essentially, that or they interpret their evidence as people do seem to be learning over time.

They also offer some form of commitment device. Essentially, they offer him to say, if you don't borrow again, we'll pay you $100 or versions of that. Or you have to pay or you can forego money if you commit to not borrowing again. They also find some evidence of that sort of suggesting that, again, these payday borrowers seem to be quite sophisticated.

Now, of course, it's a different type of sample, a different type of population. So credit card people, particularly who got credit card mailings, in particular, people who just started their jobs and so on and so forth, might be not as sophisticated.

Now, if you are a credit card company, what would you do? How would you react to that kind of behavior? Suppose you believed what I showed you earlier, the evidence that I just showed you about from the Ausubel paper in terms of people seem to be either naive or sophisticated quasi-hyperbolic discounters. What do you do as a credit card company? Whom do you target, and how do you do it?

Yes?

AUDIENCE: Perhaps you could map some kind of characteristic of the person, maybe demographics like education or socio-economic characteristics with possible naive/sophisticated and then almost price [INAUDIBLE] target each person based on those characteristics. So the sophisticated person would have the lower teaser rate and then the higher interest rate towards the end, and you could do the same for those who are naive.

FRANK SCHILBACH: Exactly. So what you kind of want to know in some sense-- you want to know who are the naive people, who are the people that we can essentially exploit because the naive person is the person who is going to be the person who signs up and then ends up paying really high interest rates surprisingly. So you can essentially figure out some ways of making a lot of money from them.

The exponential discounters or even the sophisticated people-- they will not be helpful for you because either they will, essentially, just optimize in some sense. They use some offers. They get some bonus points or whatever for signing up in the first place and then essentially just drop the card and not use it anymore. Even a sophisticated person you can't really exploit that much because if you could, the sophisticated person would understand that and then would just not sign up in the first place.

And this is kind of the answer to what Lauren just said about, if somebody if you can make a lot of money from that person, it can't be that person is perfectly sophisticated because then, otherwise, the person would never sign up in the first place.

Now, credit card companies-- there's some evidence, at least, that credit card companies do exactly what you just said, which essentially is-- so they don't have a lot of information of people that they actually mail to. The one thing that they have is zip code-level information, very often about education and some other characteristics from some other data sets.

So there's a very nice paper by Ru and Antoinette Schoar at Sloan, at MIT that looks at, analyzes a detailed data set of mailed credit card offers. So essentially, there are people who are paid to collect all the mailings that they get from different companies, and just collect them, and have them analyzed. And there's sort of a data set doing exactly that.

And so what they did is they analyzed this data set specifically and looked at how some of the details of these offers relate to things like education, zip code. So you look at sort of education-level data, like where do the highly-educated people, and where do other people live, and what they find is that education levels are systematically related to things like backloaded and hidden fees, teasers, stuff that's written in small font, having more photos, color print, and so on and so forth, essentially a bunch of stuff that's trying to trick people into things that are bad for them.

So what the credit card companies are doing-- they're essentially sort of saying, here's some stuff that is exploiting potentially naive customers. Now, you only want to send that kind of stuff to naive people or mostly to naive or less sophisticated customers, the reason being that, A, it's costly to do it. So if you send it to people who are exponential discounters or who are more sophisticated, you're just wasting money, or they might actually exploit your offer by optimizing and getting good deals out of it in some ways.

So what do you kind of want to do is you want to focus on the naive customers and sort of exploit them as much as you can. Now, actually, it's not that you want to exploit them as much as you can. There are some constraints. What are the constraints here? What is a credit card company, in some ways, worried about? Yes?

AUDIENCE: They want to make sure that they can actually pay the [INAUDIBLE].

FRANK SCHILBACH: Exactly. So this is a pretty cynical view of the world, but I think it's a pretty correct one in some ways, which is, the credit card company wants to exploit people but only to the extent that they can actually repay. The last thing the credit card company wants is for people to default, not because a credit card company actually cares about the people who might default but rather because the credit card company has, then, trouble actually getting their money back. So there's, essentially, some form of a participation constraint.

And so what Ru and Schoar find is that, at times-- and maybe this is suggestive evidence, but it's pretty neat in some way. At times when unemployment insurance from the government increases, essentially, as more people have more money available, a lot of these fees, et cetera tend to be higher, and so one way to interpret that is, essentially, there's a participation constrained if you want an optimization problem. That is to say, they try to exploit the customers, but it's subject to the constraint that the person doesn't default or just doesn't use the offers at all.

Now, that participation constraint gets relaxed now that people, due to unemployment and other types of insurance, have more money available, so essentially, you can exploit them more. This is sort of a pattern, I think, that's general for many cases. I think when you, for example, think about gyms, you might sort of say, well, people choose in gyms the offers that gyms give to people. In a way, they are meant to exploit customers.

Or do you really want what I showed you last time? You really want to offer people these monthly fees or whatever? Like you want people to sign up but then actually not show up very much to your gym because you have a certain capacity. You'll then hit your gym capacity.

But some people might say, well, why not just ask people to give them even more and more expensive contracts that they sign up so they really sort of-- to screw them over more and more? The problem is there's again a participation constraint. If the person realizes, I'm spending way too much money on this and I'm not actually going to the gym ever, that person is just going to quit.

So you kind of want-- there's this game where, essentially, you want your customer to be engaged. You want your customer to come back sometimes and feel good about going to the gym sometimes and not feel terrible about not coming, so that's why the gyms and other companies are always trying to be very motivating. We choose the best contract for you. We're trying to help you with this and that.

But really, it's, in some sense, making the appearance of trying to help the customers, keeping them happy while you can exploit them at the same time. Now, that's a very cynical view of the world, and I'm sure there are some companies who are actually care about their customers. But in some sense, I think it can explain quite a few patterns that we see in the world. Any questions on this? Or comments?

OK. So then next is-- and this is sort of, again, almost like a classic paper now because it's from quite a while ago. It's a paper by Nava Ashraf and colleagues in the Philippines. And these are clients of a Philippine bank, and they are randomized into three different groups to be receiving three different kinds of savings product.

The first one is essentially like a very simple-- sorry. The first one, number three, is like a control treatment, or it's just a standard savings account. Here's an account that you can open, and you're going to get some interest rate for saving in this account. The second one is like a marketing treatment which essentially is encouraging people to sign up. Otherwise, it's like the same, essentially trying to get people to do it.

Number one-- and this is, I guess, the treatment of interest-- is what's called the SEED Treatment, which is encouraging people to sign up, plus a commitment offer, which is clients can restrict their access to the deposits upon opening the account. So what you can essentially do is you can set some goals. These goals are either date-based or amount-based. So you can say, I want to save $1,000 or some amount, and until I've reached that amount I cannot withdraw any money.

Alternatively, you can say, I would like to save until my husband's or my wife's birthday or some other-- child's graduation and whatever you want to save for, Christmas, et cetera, and only then you can withdraw the money. As you can see, most people seem to be choosing date-based types of goals, but others also have a amount-based. You can see about 70% here are date-based, and 30% are amount-based.

Now, what they find is, A, there's quite a bit of take-up of this account, and again, when you think about this, there's not a good reason to take up this account unless you want to restrict your future self. So there's some evidence of demand for commitment.

Second, offering just kinds of account increases people's savings, so on average, people save more. I'm going to tell you a little bit about the distribution of that. Is actually everybody better off from doing that? But on average, people do save more, so essentially, it's kind of similar to the evidence that I showed you earlier. Commitment devices, at least on average, can improve outcomes or affect outcomes in some way.

And then number three-- and that's a little bit suggestive-- but essentially saying, if you look at money now versus later, a question that I showed you earlier in the class, they actually do predict commitment take-up consistent with some form of-- this is really about time preferences as opposed to maybe other things like demand effects, social-desirability bias, essentially customers maybe just wanting to make the bank happy in some way because they feel compelled to do it because they get some marketing treatment and a particularly strong one. Any questions on this? Yeah?

AUDIENCE: [INAUDIBLE]?

FRANK SCHILBACH: No, I think it's taking it-- I think it's taking it up and putting some money in it. Yeah, the take-up is put in like, once you put in some money, it's counted as using or taking up the account. Otherwise, it would be like, yeah, that's not really anything now, essentially restricting your choices in some way by putting in some money into this account.

OK. So next is some work that I've done in India on alcohol consumption, and this is a very common issue among low-income workers, in South India, in Tamil Nadu, and Kerala, and other places. It's also an issue in other countries, in Uganda and so on. So large fractions of low-income workers drink large amounts of alcohol, often daily.

What do I mean by that? They drink something like five, six standard drinks per day. What's a standard drink? It's like a small beer or like a shot of liquor, so five, six standard drinks are a lot of alcohol.

Now, they also spend large amounts of their money of their income on alcohol on the order of magnitude of 20%, 30%, 40%, so think of these as like families of five or six. Sorry, families of four or five often. What they earn is something like 300, 400 rupees per day. That's usually, often, the family income. Some earn a little bit more, but that's something like $5, $6, $7 per day. And often they spend $1 or $2 on alcohol.

And so when you ask people, when you ask women, when you ask men about, how does alcohol affect your lives, you get sort of this uniform response of people saying like, well, if only liquor stores closed, my life would be so much better. I would love for liquor prices to be higher, and I would like to find some way to reduce my drinking. But I have trouble doing so.

When you ask people, OK, now you would like to reduce your drinking. It would be great for you the liquor stores to be closed. Why is it difficult for you to reduce your drinking? The common response is always, A, addiction, which makes things tricky anyway, but B, people say they have physical pain, physical pain from work.

Particularly, these are people with very low levels of education, so often they're illiterate and so on. So it's very hard for them to get any job or the like, so what instead they have to do is, essentially, do physical labor, hard physical labor. These are like construction workers, rickshaw drivers, sewage workers, and so on and so forth. This is really hard work, and they tend to have, then, lots of physical pain from their work.

Now, why is it that, then, the pain exacerbates, potentially, people's self-control problems? Why is that making things worse? Yes?

AUDIENCE: [INAUDIBLE] you might have been drinking for instance social reasons or alcoholism. Now you're also self-medicating for [INAUDIBLE].

FRANK SCHILBACH: Right. So what are you saying, essentially, is you can do self-medicating physical pain, in addition to maybe some other reason, social reasons and so on. It turns out, in this setting, at least, specifically, people tend to not drink so much for social reasons. There's some social function. There's like funerals or other sort of festivals where lots of people drink, but they're drinking-- in particular, in rickshaw is often people drink on their own, essentially to numb their pain in some ways.

Now, when you think about self-control problems, often where self-control problems arise is when you have short-run benefits and long-run costs. Essentially, that's sort of the consumption good that people over consume. Now, when you think about physical pain, what does physical pain do? It very much increases the short-run benefits of drinking while keeping long-run costs or anything else constant.

And so if you think about, you have lots of short-run benefits now of drinking because there's lots of pain that alcohol helps numbing-- and alcohol is a very powerful anesthetic as it turns out. So then, essentially, it sort of increases the short-run benefits, and that's sort of the short-run desire to drink. And then any long-run costs about health and so on and so forth are very much in the future, and that's where, essentially, the self-control problem potentially arises.

Now, people not only drink a lot overall in Chennai and in surrounding areas, but they drink also quite a bit, in particular rickshaw drivers, during the day. So what I was doing there is essentially just randomly walking around in Chennai-- our RAs would do that-- walking around in Chennai and just breathalyzing people more or less randomly, offering them, essentially, would you like to do a breathalyzer test for some small amount, regardless of the result.

And about half of these rickshaw drivers-- and these are all cycle rickshaws, so it's not particularly dangerous to do that. But about half of them are showing positive breathalyzer scores. So essentially, half of them are at least somewhat inebriated. About 20%, 25% are pretty drunk, as in their blood alcohol content is about 0.1 or higher, which is above the US legal driving limit overall.

Now, this is during the regular work hours. These are people who are actually at work. Now, then sort of seeing that and sort of having people report about their self-control problem, I was then sort of wondering, OK, now, what kinds of commitment devices could be perhaps offered to people to reduce their drinking given that they tend to report self-control problems, or physical pain, or self-control problems related to physical pain are a key issue and preventing them from reducing their drinking if they desire to do so, of course? What could we do?

Yes?

AUDIENCE: We could just tell them you're going to randomly administer a breathalyzer test, and if they haven't been drinking [INAUDIBLE].

FRANK SCHILBACH: Yeah, so we could, essentially-- exactly. So you could essentially say, I'm going to try and find you. I'm going to call you sometimes randomly, and you get some reward if you're sober, so essentially incentivizing people to be sober. That's exactly right. You could do that.

Now, is that a-- so what would be a commitment device? What would a commitment device for that look like? So what you just mentioned is essentially just providing people incentives, incentivizing them, and that could truly work. How would I show that these are, in fact, self-control problems or people have quasi-hyperbolic or similar preferences?

AUDIENCE: So if they choose to enter into this study, they're [INAUDIBLE] for example maybe [INAUDIBLE] they've been drinking [INAUDIBLE].

FRANK SCHILBACH: Right. Essentially, you have to give people choices, and some choices are potentially dominating. So what does that mean? I'm giving you some choices. You can choose to either receive the incentives, and you only receive these incentives if you're sober. Alternatively, I'm going to just pay you some amount, and that amount, ideally, is like higher than the amount that you could get from these incentives.

Now, then if you choose the incentives, what does that mean? Essentially, that means you want to increase your future prices of drinking. That would be, essentially, demand for commitment.

Now, the other thing we could potentially do is what I showed you earlier, which is the drug that's called Antabuse which, essentially, is a drug that you can take to prevent yourself from being able to metabolize alcohol. I was actually thinking about that for quite a while. The reason why I wasn't doing that was the tricky part here is that, once you actually start drinking while you're on this drug, that's very dangerous.

And particularly if you have been drinking for quite a while, withdrawal symptoms related to alcohol are very dangerous, so if you have been drinking alcohol for 10, 20 years like many of the people in the sample have, abruptly reducing your drinking is dangerous because you can essentially get what's called delirium tremens, very severe withdrawal symptoms that could even-- you could even die from that.

Now, one thing you could do is when you get withdrawal symptoms, you can actually start drinking, and that helps. Now, the problem is, when you have taken Antabuse, you can't do that. So essentially, there's the issues, and then you get this alcohol-Antabuse reaction which is really bad. So I ended up not doing that for various ethical and other reasons.

But what I did do is essentially give people the option of dominated choices. So what does the experiment look like? It's a three-week field experiment with the rickshaw drivers in Chennai. We didn't do the random breathalyzing in the field, in part because it's really hard to actually find people if they're sort of roaming around on their rickshaw. Not everybody has their phone, or answers their phone, and so on.

So instead, we asked people to come to the study office between 6:00 and 10:00 PM every day. It's between 6:00 and 10:00 PM because breathalyzer tests can tell you about drinking during the previous something like six to 10 hours, so if you breathalyze me now, what you can tell is what I have been drinking in the last, let's say, eight hours or something. You cannot really tell whether I have been drinking yesterday. So if we did the breathalyzer test in the morning, that would not be particularly helpful because, really, it can't tell you very much about the drinking on the previous day.

And then we provided financial incentives for sobriety for a subset of individuals. What do these financial incentives look like? They look very simple and something very similar to what you just suggested.

So option A-- these are the financial incentives-- are people are given 60 rupees, which is about $1, just for showing up. So just come to the office, and show up. Do a breathalyzer test, and do some survey questions. And you get like $1 for doing that. And then if your breathalyzer score is 0, you get another dollar, 120 rupees. That's essentially the incentives for sobriety.

Now, option B-- and people were given choices for that. Option B was-- there was like three different versions of that. The first one is where option B was 90 rupees, which, essentially, is, come to the office, and you can choose to get 90 rupees. Just come to the office. Whenever you show up, you get 90 rupees, regardless of what your breathalyzer score is. You are breathalyzed, but it doesn't matter what your scores for your payment.

Now, when you choose the incentives over option B, is that a commitment device, or how do we think about this choice? What do we learn from that choice?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: Why?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: So let me give you an example of a person who might choose this. Suppose there's a person who is actually mostly sober, is an exponential discounter, and wants to be drunk just once a week. So-- sorry-- these are choices for six days for like the following week. So the person is perfectly rational. The person has perfect foresight and knows that they're going to be drunk once next week, and they're going to choose option A because they think it's a great deal.

And so they actually don't want any commitment. The only reason why they choose that is because the expected value of the money that they will get will be higher if they are, at least half of the time, sober. So that choice, in fact, is not a commitment device.

However, moving towards choices two and three, now we get into territory of dominated contracts that, in fact, are commitment devices. So the key part here is that, when you look at the second choice, when you choose, now, option A over option B, you can actually only do worse. The only reason why you choose option A is because you want to have incentives.

Now, you risk showing up drunk on some days, in which case you get less money, but the benefit of that now is that then now you have these incentives. So essentially, you want incentives, but what you take into account is that, potentially, if you don't show up sober all the time, you might lose some money. So this kind of contract or this type of choice we cal a weekly-dominated contract or choice in terms of steady payments. So if people choose option A and the second choice, that is some demand for commitment.

Now, when I look at the third choice, now option A is strictly-dominated. So now, if you choose option A, you will do worse for sure in terms of how much you will be paid. Every day, you got like 30 rupees, which is about 10% of people's daily incomes. Every day, you got 30 rupees less, and the benefit, again, is like incentives for sobriety. So if you want to choose these incentives that will be costly for you for sure-- and now you have a sort of weigh whether you like those or not.

So what I find is and what you see here is, essentially, the fraction of people choosing incentives for choice one, two, and three. So in black you see choice one, which is a 90 rupees choice. In dark blue you see the 120 rupees choices. You see the weekly-dominated choices, and then you see, in light blue, the 150 rupee choices.

These are the strictly-dominated choices, and there's like three weeks. And people will do this. So each week, they choose for the following week what incentives they would like to set themselves for the next six days. So these are the three options again, and you see the choices over time.

So what we find is or what I find is that, in fact, quite a few people, about half of the individuals, choose the incentives when they're weekly-dominated, which have some evidence of demand for commitment, but perhaps more strikingly, about a third of individuals choose the incentives when they're strictly-dominated.

So these are people who are willing to forgo three times in a row, not just once but in the second week and also ir the third week, and then if anything, the fraction of people choosing these incentives goes up over time. People are willing to choose these incentives and willing to give up about 10% of their daily incomes for like an entire week to receive incentives to be sober. So that's very strong evidence of demand for commitment.

Now, what we also find is, when you sort of randomize just the incentives themselves for some people versus unconditional payments overall, these incentives are, in fact, successful in reducing people's day drinking. So people actually show up more sober when they receive incentives. However, as you might have expected as well, the problem is the breathalyzer incentivizes during the day, the time before 6:00 and 10:00 PM, before people come to the study office. It is not incentivizing the time after that's in the evening.

And as you sort of-- this is some work by-- Holmstrom and others would say, if you have multitasking at different times of the day or different actions that you can take, if you incentivize one thing, what often happens-- people follow these incentives, but then they substitute to other things in their life.

So then what, in fact, happens-- overall, people's overall drinking does not decrease very much. So while people seem to have quite a bit of demand for these incentives, in fact, it is helpful for increasing their daytime sobriety but not helpful for decreasing their overall drinking. So then I was looking at the impact of that treatment in the sense like, now people are more sober during the day.

In fact, somewhat surprisingly, I find very little evidence on labor market outcomes. It's not like actually people are working better, but I do find people make different savings decisions. People are willing to save a lot more when they're sober, even when you take into account that they also might have more money overall, or at least more money available. Yes?

AUDIENCE: I was wondering if there was [INAUDIBLE] but they may drink at night

FRANK SCHILBACH: So I spent quite a bit of time thinking about demand effect and making sure that people are-- some of the people in the setting have much less concerns about what other people think when they drink. They're very happy to tell you, yesterday I drank six drinks. They're also very happy to tell you, yesterday I spent a third of my income on alcohol and so on.

People are very open about this, so it's not like people misreport in surveys and so on. People's reported drinking is also very much consistent with the actual breathalyzer scores, so if you sort of matched that up in terms of how much have you been drinking today versus what the breathalyzer score says, that seems consistent as well.

Now, there are some studies looking at social-desirability bias and demand effects, and often what you find is that when choices are not incentivized, when they are very weak incentives, there is often evidence for demand effect and social-desirability bias. But when you make things very costly in a sense of like, this is a very costly thing for you to do to just make the experimenter happy-- we spent a lot of time essentially being very clear about like, you can do whatever you want and so on and so forth.

And what we tend to find is that, in the first few days, people seem slightly uncomfortable in this. There's more to the study, but there's like a baseline period of about a week, and the first few days, people seem to be slightly uncomfortable of being drunk in the office and so on and so forth and sort of having positive breathalyzer scores. That goes away very quickly, so people are very happy to show up as drunk as they are.

So overall, I would think, if this is one choice, and you're like, maybe people are making mistakes, or people maybe want to make you happy, once you make that choice once, for a whole week you get, essentially, a lot less money than you would get otherwise. You make that choice again. Again, you get, like for a whole week a lot less money than you would otherwise, and then people choose it yet again.

So while I can't entirely rule out this explanation-- there's a discussion of that in the paper. While I can't rule out this entirely, it seems unlikely, at least in the second and third choice, given that it's really, really costly for people.

AUDIENCE: My question was also related. If they know that the [INAUDIBLE] device is not working because they are drinking at night, why do they keep--

FRANK SCHILBACH: Right. So the second question is like, OK, now why are people making these choices? So one broad question is like, OK, so-- when talking to people, a lot of people would say, well-- they would come, be like, last week it was really difficult. I didn't really succeed and so on. And then they would be like, from tomorrow onwards, things will be different.

So there is lots of people who, in fact, seem naive in the sense of they really think, going forward, they will change their behavior. Often, I think what they are reasonably clear about is how often they will actually be sober going forward. What they have trouble with is, essentially, predicting their behavior later in the day. So they seem to think like, OK, tomorrow I'm not going to drink, and then I'm also not going to drink at nights. That doesn't seem to change.

Now, there's a second explanation that's also in the paper and discussed in more detail that I can't really necessarily rule out. There are actually some benefits of reducing people's drinking. These are all kind of small benefits, but they actually sort of add up.

So one part of that is savings. People save a lot more money. They get more interest from saving. That's actually quite a bit of money that they make from that, so they potentially make better decisions. Second, they have like-- so while it's not significant, people have somewhat higher earnings. People also have somewhat reduced costs of drinking and so on. So there's some, essentially, evidence of several benefits in the order of magnitude of like 5, 10 rupees per day.

So when you have somewhat increased earnings, somewhat reduce expenditures on alcohol, increased savings-- and then on top of that, people would also tell you they like to be what they say, like a sober man. These are all men. They like to be a sober man, and so they have some value of, actually, sobriety during the day.

So I think it's a mixture. My guess is-- when we've had to best explain the evidence that we have, it's a mixture of there actually being some evidence of benefits of being sober that you can weigh against like 30 rupees forgone benefits from the study. And there is also some naivete in a sense of people desires, people's beliefs about wanting to drink glass also in the evening, and that's just not necessarily working out.

I want to say another comment to this, which is when you see people choosing commitment devices that fail, you can't necessarily rule out that people are reasonably sophisticated, the reason being-- for example, if I were a smoker that smoked a lot and the value of me stopping to smoke is really high-- suppose I think if I just could stop smoking I would live like five years longer. That's a huge value in terms of the benefits.

If somebody came to me and said, there's a commitment device with a 1% chance it's going to work. Would you like to buy it? And it costs $100. I might actually choose this commitment device because the expected value of that is actually higher, even if 99% of the cases I'm actually going to fail.

So then you're looking at the data. You might say, look, these people are essentially making a bunch of mistakes. But I think from their perspective it's rather-- they have been drinking for so long. They struggle with this, and they try to reduce their drinking. There is a chance that maybe this will work. Maybe it will not. So let me really try and do this and see. Unfortunately, as it turns out, it's, in fact, not successful, at least when it comes to their drinking overall.

Second, speaking of smoking, as a second paper on commitment devices related to sort of addictive products, this is a voluntary commitment product for smoking cessation. Smokers are offered a nonstandard savings account. This is the same setting as in the Philippines where these are clients of a bank. These are smokers selecting on actually somebody being a smoker.

And they are offered the following commitment device. You can deposit funds for six months, and then you can take a urine test for nicotine and cotinine, which apparently tests pretty well, whether you haven't been drinking-- sorry, not been smoking for the last week or so or a bit longer.

If you pass, you get the money back that's in your account. If you fail, the money is gone, essentially. Now, do we think this is a good commitment contract? Or do we like this or not? Or how do we think about this commitment contract? Yes?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: Yeah. Exactly, you could lose quite a bit of money and make people quite unhappy, but do we think-- actually, suppose you were sophisticated. Would you sign up, or how would you behave? Like suppose I offer you the contract. You have it now. What would you do?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: Right. So you put money in it, but I think the one key part here is that the actual quitting only occurs in like six months from now. It's to say, it's sort of a little bit of a funny thing in the sense of saying, look, you really want to quit smoking. It's like, in six months from now, you already have lots of long-run benefits-- sorry, lots of long-run costs of smoking, which is lung cancer, health issues, and so on and so forth. Now I'm sort of adding long-run incentives in like six months from now, which is a little bit far away.

So what it sort of needs is-- in a way, you would not start quitting to smoke right away. You would say, well, in five months from now, I can sort of stop. And now, of course, you can then build your own commitment device by putting in a lot of money and then really ramping up these incentives. But in some sense, what you kind of want is a commitment device that-- I sign up for it. I'm like really excited to stop smoking, and now you want to provide incentives almost right away to get people going.

But instead, it's this commitment device that requires quite a bit of sophistication, in a sense, of saying, now, I know that in like six months from now I want to stop smoking. I kind of don't want to stop smoking right now. I can always do it tomorrow, because people like to delay, depending on how naive they are and so on. And so I can see lots of people then saying, yeah, in three months from now I'm going to do it. And then they're going to put in some money and so on, but they end up not doing it eventually.

It turns out, empirically, it works reasonably well in a sense. There's like 10% of take-up. Like 10% of people actually put in some money. There is also like an impact on smoking of 3 percentage points. That sounds kind of small, but that's actually pretty sizable in terms of getting people to stop smoking is pretty hard.

Also, these effects persist in surprise tests like 12 months later. So when you sort of surprise people later and sort of say, hey, surprise, here's a test, you get some money for doing it, turns out that people who offered this commitment, smoking a contract or product are, in fact, less likely to smoke.

Now, a second question related to that is to say, if people are unhappy about their smoking in the future, if people would like to reduce their future smoking, there's some arguments that taxes can be some form of not quite commitment devices but ways in which you could reduce your smoking.

So the rickshaw drivers in Chennai would of tell me, I would love for alcohol prices to be more expensive because that would help me reduce my drinking. So if they could set prices, quite a few people would say, I would set prices really high, so that would help me reduce my drinking. So if people could choose their own prices and if they would set high prices, that would be, essentially, a form of a commitment device to reduce your smoking or drinking.

So when you look at smokers, there's lots of people who say they would like to quit. About eight out of 10 US smokers say that. If you have friends who smoke, you will get this common patterns. So lots of people say, I would love to quit, lots of quit attempts that often are not successful.

Now, one way you can sort of reduce smoking potentially or accomplish your goal is to say, prices might be higher. Again, higher prices-- essentially, that's the law of demand. Like if prices go up, people smoke less, and that's true for smoking, drinking as well. And so that might help curb people's self-control problems.

Now, one simple question that John Gruber, who was in the economics department, and Sendhil Mullainathan we're asking is like, well, once we increase taxes, now smokers are actually happier. And so if it's true that people have self-control problems, people might be happier because it helps them, essentially, reduce their smoking. It helps them deal with their self-control problems.

You could even say, once prices become infinitely expensive, as long as people can't substitute in certain ways or get around these rules, they might even be happy about banning smoking because that would be the simplest way of getting rid of their smoking habit if they really want to do so.

Now, Gruber and Mullainathan have an empirical test of this in the US and Canada, and in fact, when you look at variation over time, higher cigarette taxes are associated with higher self-reported well-being, in particular among those who are likely smokers. Now, you could also say, well, other people are happier as well, but that's not that interesting because there's externalities from smoking.

And if you are not a smoker, you should be happy about smoking taxes because, A, they're going to reduce your externalities. People are going to smoke less in your face, and you might sort of like that. Second, there's going to be revenues from taxation. You're also going to be very happy if other people pay higher taxes.

But what they do is they look at, essentially, households particularly that are likely smokers, and that helps then identify-- or that's much more interesting a result than households who are non-smokers. There's some caveat that some of the respondents might be spouses of the actual smokers.

Again, that's, in some sense, less interesting from the beta-delta perspective because if the husband or wife wants to get their spouse to smoke less, they might be quite happy about it, but it's more like because the spouse thinks their husband or wife have a self-control problem as opposed to they have one themselves.

Or it could be even-- like for lack of self-control problems, it could just be the husband likes smoking, the wife does not. If prices go up, the husband might still smoke less, and the wife might be happier or the other way around and nothing to do with self-control problem. Just like if prices go up people, consume stuff less.

To be clear, such effects are not possible and not consistent with exponential discounting because if you're an exponential discounter, you would either smoke because you like smoking or you would not smoke. There's no scenario in which you are smoking but you really would like to quit. If you would like to quit and if it's worth for you to quit, you would actually do that, so you would not be happier about higher prices the same way as you would not be happy about higher prices for apples and bananas. People don't like high prices because, essentially, they have to pay more, and that sort of reduces their budget. Any questions on this? Yes?

AUDIENCE: [INAUDIBLE]

FRANK SCHILBACH: Yes. So I think you're bringing up a very good point, which is often a big discussion for so-called "sin taxes," which is essentially taxes on either cigarettes, on alcohol, on sodas, and so on. So there's different objectives often. One is essentially helping people who potentially have self-control problems. Second, there is sort of redistribution as a goal or a problem in some sense.

And that's the same case in India, in some sense. If you increased the alcohol prices in India, on the one hand, people would drink less, but the elasticity of drinking tends to be fairly low, meaning that if you increase the price of alcohol, or cigarettes, or the like by 1%, usually the consumption only reduces by less than 1%, which means that overall expenditures-- while people actually drink or smoke less, overall expenditures actually go up.

And so if you're worried about the poor, then, in particular, A, they tend to consume these types of goods more when it comes to smoking, drinking, but also sodas, in particular in the US-- when you're worried, then, about increasing taxes and then expenditures and then, essentially, having a particular high burden among the poor--

So then there's questions on how to deal with that. So one potential "why did you do this" would be, in some sense, to refund, then, the taxes that are actually incurred, in particular, then in some form of transfers. That's often not necessarily feasible, but that's exactly the problem when you think about, for example, soda taxes.

There's a very nice paper by Dmitry Taubinsky, and Hunt Allcott, and so on-- I can add this to the slides-- that essentially looking at exactly that in the US. When you think about soda taxes, how do you deal with two different objectives? One is helping people to consume less sodas if they desire to do so and second, redistribution dealing with the fact that the burden is particularly high among the poor in terms of how much money to pay.

You kind of want it to be the opposite. You want the rich to pay more taxes rather than the poor, and some of these taxes do the opposite. And then there's a question of, how do you weigh these two objectives, and how you can maybe undo some of the effects that you're doing? Yes?

AUDIENCE: [INAUDIBLE]?

FRANK SCHILBACH: I think these are simple-- these are just simple surveys about people's happiness and so on and so forth. Is that your question?

AUDIENCE: [INAUDIBLE]?

FRANK SCHILBACH: Oh, I think this is just trying to predict it using the demographics. So I think one of the key-- the key weakness of the study is two things. They just do not have data on like, does the respondent actually smoke, so they only know, essentially, household characteristics, how rich are they are, and so on and so forth from, essentially, a bunch of survey questions. But there's no actual question of, do you smoke or not?

And so that's why, in part, this paper, in fact, is not published in a top journal, the reason being that exactly that's the issue. A, you don't actually know whether the person smokes. B, it could be that it's a spouse of a smoker that's answering the question.

So we kind of know that the propensity of that household to smoke from other data sets when we try to just predict smoking using these demographics is high, but we don't actually know in the specific cases are people smoking, which makes it sort of vulnerable to these kinds of concerns, yeah.

OK. Let me talk briefly about a fertilizer and then summarize a little bit the evidence that we saw. So this is a paper by Esther Duflo and Michael Kremer, who recently won a Nobel Prize in economics. Esther Duflo is in the Economics Department at MIT as well, and Michael Kremer is at Harvard. It's a paper with John Robinson from 2011 in the AR.

What this paper looks at is fertilizer used in Western Kenya, and this is one of these technologies in developing countries where there's quite a bit of evidence, and people think the returns to using fertilizer are high. That's a thing that farmers could use. Essentially, it would increase your yields. The returns are on the order of magnitude of like 50%, 100% often over the course of like a few months.

So it's a really highly profitable type of investment. It's also like a divisible investment. It's not like a cow, or like a tractor, or something where you have to save a lot of money to actually buy it. This is a thing where you can buy like a kilo or 5 kilos of fertilizer. You can lose very small amounts of money and then start saving. And if the returns are really that high, people are just using it and then become richer over time.

Now, there's a persistent finding that fertilizer use, in particular in sub-Saharan Africa, tends to be low, including in Western Kenya and the area of this study. Now, one explanation that people often say is that farmers would like to purchase fertilizer. When you ask them around the time of harvest, which is when they have a lot of money-- so there are these harvest cycles.

Farmers farm maize in this area. When you ask them around the time of harvest when people have lots of money and ask them about their plans to purchase fertilizer, they would say, oh, yeah, I'd love to put this fertilizer, it's great, and so on and so forth.

But then lots of stuff comes up. Lots of expenses pile up, school fees, and friends ask for money, and other festivals and so on and so forth. So then when the actual new season comes, when the planting time or the top dressing time comes when the maize is a little bit higher and you're supposed to add fertilizer to your maize, then people don't have any money left.

Now, one way to overcome this issue was-- essentially, the best kind of commitment and some sense is to just do the thing that you're planning to do, and that's exactly what they're doing in this experiment. So what they're doing is they vary the timing of the purchase decision and offer people time-limited discounts around the time of harvest. So around the time of harvest, they give a very small discount and say, you can essentially buy fertilizer, and that's going to be delivered to you around the time of harvest. But you have to buy it right now.

And they get these different forms of discounts, but essentially, the discounts tend to be small. And the key part here is that these discounts are time-limited, as in like it's only around the time of harvest, so you can only do it right now. You cannot procrastinate it in any way and say, oh, next week, or in two weeks, or three weeks from now, I'm going to do it.

And so that's essentially a form of a commitment device in the sense of, in some ways, the best commitment device of, when you want something to get done, you can just do it, and then you're essentially done. So people do these early purchases of fertilizer, and nobody resells it or the like. That's just not a thing people do. In principle, they could obviously do that, but that tends to be not the case.

And what they find, in a sense-- they find very large effects of this type of commitment device or the early purchase option. Even when the discount is very small, very minor-- often it's just like delivery to people's homes from the fertilizer store, which is not very hard to do. So even when this discount is relatively small, there's large effects on people fertilizer use.

And the effects are much larger than like offering people discounts around the time of planting. So they have another condition where they say, around the time of planting, when the time comes to actually use fertilizer, they have a 50% discount around that time. But essentially, that discount almost does nothing, the reason being that, when people have run out of money, it doesn't matter what the price is. You can't buy any fertilizer because you're cash-constrained and can't buy it.

Now, that's a very interesting finding, in part for policy, because there's also quite a bit of concerns about over-adoption, about fertilizer subsidies being very expensive, and so on and so forth. And now, when you provide time-limited discounts around the time of harvest that are very small, you can potentially, essentially, not spend a lot of money, have large increases in fertilizer use among the people who have self-control problems, among the people who would actually like to use fertilizer.

If instead you provide discounts around the time of planting of 50% or higher, A, that's really expensive to do, and governments, in particular in Kenya or sub-Saharan Africa in general, tend to not have a lot of money. So it's a very expensive thing to do.

Plus, you're also distorting a lot of decisions among exponential discounters. What you're doing is, now I'm giving you-- I'm making fertilizer much cheaper for you. If you don't have a self-control problem to start with, you're going to overuse fertilizer because now, essentially, fertilizer is like artificially cheap for you, essentially. So you push some people to overuse fertilizer using an actual discount around the time of planting.

Instead, what this policy does-- essentially, it gives very small discounts that are very cheap, and it mostly affects people with self-control problems. Those are the people who, essentially, would procrastinate buying fertilizer. They buy it right now. They don't spend a lot of money on it, and you could have potentially large effects, as they have shown in this paper. Any questions on this? Yeah?

AUDIENCE: Did they do a part where they show that farmers become more sophisticated?

FRANK SCHILBACH: No, they do not. They have, essentially, one-shot decisions for farmers, and they sort of have some effects over the course of several seasons. But it's essentially not the same choices and so on. So this is, in some sense, an early paper that doesn't quite look into that. Some of their work on sophistication and naivete comes a little later.

So let me briefly summarize and talk a little bit about people feeling when it comes to using commitment devices. So I've shown you several examples and there are quite a few more examples of demand for commitment in different research studies. These are all research studies that people have done one way or the other.

Often, there's a significant share of people who demand commitment one way or the other. That's [INAUDIBLE] there's a significant share of people who struggle with self-control problems in some way, and they also are at least partially sophisticated because they sort of understand it and demand commitment.

Now, there's also like a very high variation in the fraction of people demanding commitment. In some places, it's very high, as I showed you in the alcohol examples and in some other examples that I haven't necessarily shown you. In other examples, like, for example, in the smoking example and so on, the demand for commitment tends to be, actually, quite low.

So why is that? Well, we don't actually know necessarily. There's a few explanations that people have. One of them is uncertainty. People might be really worried about the risk. So if you have lots of uncertainty in your life, if you don't know whether next month you're going to be smoking or not, or you might have a really-- you might have a really stressful month next month and you don't probably know whether that's going be stressful or not, you might not want to choose a commitment device because it's very costly for you, potentially, because you might start smoking again or do other things for reasons that are not necessarily related to self-control. It's just out of your control.

Similarly, for example, in the data entry example that I showed you, people might not choose to have a positive target because they're really worried about risk, and in particular, one characteristic that was very much predictive of whether people choose these commitment devices, whether they have kids-- the reason being that the kids-- they might be sick. They might have really bad nights and so on and so forth, and so that's an increase-- that's the risk of data entry productivity in the future.

So one part is uncertainty. A second part is naivete. Partial naivete can get people to not purchase or demand certain commitment devices, and naivete might vary it quite a bit across settings. It might be that you might just be like a first-time customer or a first-time user of either payday loans or of drinking, and smoking, and so on. You might be quite naive. In contrast, in my setting in Chennai when I looked at drinkers, there people have been drinking for many, many years. In some sense, they're not as naive about their drinking, at least overall.

Another aspect is experience with commitment devices, and this is what your question was about. Like when you provide people commitment devices, maybe it requires some learning over time. And again, if you look at different settings, people have different types of experience. Overall, we don't know the answer to these questions. In a sense, we don't actually know exactly what's going on why is demand for commitment quite different across settings.

A second question that we don't really know is like, well, so there are these research studies that look at commitment device and say, OK, commitment devices, at least in theory, should help some people. But we see actually very few real-world examples that actually help.

Yesterday, you mentioned some of them that seem to be at least helpful for some of you. By the way, if you would email me those, I'd like to collect them and report back to David Laibson who says uncertainty is the issue. But we don't have it really figured out in some sense. If commitment devices were really that great, you would think that it really would take off. There would be a company that would really make a lot of money with using them.

There are some companies that we see in the world, but it's not really-- it can't really say it has really fully taken off, perhaps some companies related to cell phone usage, or computer usage, and so on, but it's not as prevalent and widely used as we might expect, given the theory literature that we have.

Now, one important part that's really another potential contributor to [INAUDIBLE] demand for commitment is that people might not only be naive in a sense that they might not understand the value of commitment devices and then that might prevent them from taking them up, but even conditional demand commitments they might fail.

And there's a couple of examples here. For example, in the Philippines savings accounts example that I showed you, the SEED commitment savings account-- and John has a very nice paper that shows that. In fact, when you look at the same setting, a similar experiment, offering people this commitment contract has positive effects on people's savings. So people do actually save more on average compared to a control group.

However, there's also a pretty large fraction of people who fail in reaching their goals, and then often they have to pay some penalty for doing that. Now, that's really bad marketing for your product. If you think about selling this product, if half of your customers are really unhappy about it, that's going to be very tricky to do. So there's lots of questions about how to best design commitment devices, how can we perhaps target customers who might not fail and perhaps design them differently for different people, but we haven't necessarily figured out how to do that.

Liang Bai and Gautam Rao and co-authors have a similar example of a health commitment product in India where, essentially, they're trying to incentivize people to go to hypertension doctor visit to get checkups for their hypertension. Lots of people say they would like to go and so on and so forth. You offer them commitment devices to essentially provide themselves incentives to go.

Pretty few people actually sign up in the first place, which is also consistent with some form of naivete and so on and so forth, but even among the people who sign up, lots of people actually fail. So you end up having people who essentially set themselves incentives to go to the doctor. They're willing to pay for going in the future or setting themselves incentives to go to the doctor in the future, and then they have these incentives. And then the incentives are actually not successful, and they end up not going.

Again, that's very much consistent with naivete or at least partial naivete or partial sophistication. And there's many questions now about, if that's the case, how do we design better commitment devices that work for more people that are more successful for people, and how do we avoid that some people sign up for them when they, in fact, are doing worse because, again, that's really bad marketing for your product. And of course, it's bad for the people who are doing worse. They would be, essentially, better off if they had never been offered this device, at least ex post. Any questions on this?

So then, very briefly, there's a second view that you might have is to say, well, maybe commitment devices are just not that helpful. In some sense, we have not figured out how to do this. Companies have had lots of time to figure this out. Researchers have not figured this out in a sense of like-- well, we have lots of evidence of demand for commitment in terms of people wanting commitment devices. We have, actually, not that much evidence of commitment devices being useful in the real world in the sense of persistently showing that they make things better.

There are some examples, to be clear. For example, the data entry example does show that people are more productive at work, and probably employers should do that. But another view would be like, well, if commitment devices are not really helping-- so think of commitment devices as a way of providing people some choice options for given self-control problems or given naivete.

Now, there's different things you could do. You could do some things in terms of trying to address people's naivete, and the problems ask you a little bit to think about that. How do you actually get people to be less naive if that depresses demand for commitment? Another way to say is you could try to essentially try to reduce people's present bias or get at the sources of people's present bias overall.

There's different ways, and we have only started thinking about or coming up with some potential explanations, but for example, a paper that we have on sleep finds that when people are napping in the afternoon, which some of you do also in my class-- that reduces your present bias and [INAUDIBLE] task and also savings.

So that's to say, perhaps sleep, perhaps alcohol consumption, perhaps other sort of factors might affect people's present bias, so if you could understand these underlying factors and if you could tackle them, that would be another way of getting around, potentially, self-control problems causing trouble by getting at the root of this particular issue if you think that's an issue overall.

There's some other research that I find quite interesting, which is the idea that present bias is very much related to attention in the sense that people pay too much attention to the present compared to the future. So now, if you could sort make the future more salient in certain ways, if you could make people think more about the future, how things will be like, they might behave more patiently.

So Hal Hershfield has a series of papers, and Hal Hershfield is the guy on the left, the picture that you see, who used computer software to make people look older. So on the right of the screen, you see Hal Hershfield like another 40 years old or something, and so what they did is they tried to show people, essentially, pictures of their old ourselves. And this is how you're going to look like in 40, 50 years from now, and then think about how things might be like in terms of your health and so on and so forth. And then get people to make savings choices.

And there's some evidence, at least, that increasing people's focus and attention to the future might actually make them more patient, and there's quite a bit of work of people trying to do that right now.

So just to give you a brief summary-- I think I said already almost everything that's to be said-- exponential discounting is like a workhorse model of modern economics. It's extremely important. And just to be clear, it's helpful for many applications, and it's been a very successful model.

There's some limitations and some things that we cannot explain, so quasi-hyperbolic discounting or some forms of different discounting models might be able to improve the predictability of our models. Commitment devices, in particular, may help improve outcomes, but we haven't quite figured out how to make them actually most useful for the world. There's lots of research going on in this area.

Next week, we're going to talk about risk preferences. In particular, I'd like you to read the paper by Rabin and Thaler, 2001. In recitation this week, there will be more on time preferences, in particular related to the next problem set, and then sort of an introduction to risk preferences. If you don't remember what risk preferences are, you should very much come to recitation and get a refresher of that. Thank you very much.