

Derek Reed – Session 17 of The Behavioral Observations Podcast

Matt: [00:00:00] This is the behavioral observations podcast with Matt Cicoria session number 17.

Intro (Kim): [00:00:11] Welcome to the behavioral observations podcast stimulating talk for today's behavior analysts.

Intro (Kim): [00:00:19] Now here's your host Matt Cicoria.

Matt: [00:00:24] Everybody is Matt here and I decided to come back in session 17 to hear real observations podcast. And I want to open the show with a question for you. What does risky sex excessive alcohol consumption drug use an indoor tanning have in common.

Matt: [00:00:47] I'm not exactly sure what that answer is but I'm more sure after having this discussion with Dr. Derek Reed of the University of Kansas has applied behavioral economics laboratory behavioral economics is his area of expertise and he joins us today to give us I guess in part one of our tutorial on all things behavioral economics and in part two we talk about some of those you know kind of excessive or problematic societal behaviors that I listed out in that question. And I think that part is a real fascinating aspect of what behavioral economics provides in terms of a mechanism for understanding you know things like impulsivity decision making and things like that. So you know a lot of this stuff is stuff we don't often talk about and applied behavior analysis. And so I think Derek's parents on this program is going to be helpful because he really makes the case as to why we should understand these concepts and how that it might inform our practice. I mean not to that we're going to be going around doing behavioral economic research or or using some of the procedures that they use but more of as perhaps a world view or a way of understanding consumption of reinforcers so I don't want to spoil the interview too much more than that but I wanted to place our discussion in context. So I'm going to get to the interview here in just a bit before I do so though I do want to mention that this podcast is sponsored by beside 21 dogs. Outside the box training series you can check out their C-u offerings at beside 20:00 forward slash CGU.

Matt: [00:02:33] And then thirdly I do want to thank folks for again submitting some iTunes reviews I'm going to try to read a couple every once in while. I'll read one. I've got a couple of here from some international friends. I think these are from either the UK or Canada behavioral. I R L they write here she writes easy listening and perfect for all people in the domain of behavior analysis keep up the good work. Well thank you very much behavioral. L. Yes I can. Yes they are from outside the states because they spell behavior with a U. So that's that's one clue I guess. Let's see. 1:47 Dunlop's says really great to hear a variety of Abiah related conversations. I especially enjoyed the OBM discussion with Manny. Very informative and enjoyable. Thanks Matt. Well thank you 1:47 Dunlop. I will be having Manny Rodriguez back on the show and with his co-authors Shannon Biaggi and Dan Sunbird that we're going to talk about their book that just came out on all things. Obm So if you like that show and continue tuning in and you'll hear those guys shortly.

Matt: [00:03:46] In the meantime please enjoy this conversation with Dr. Derek Reid. Hey Dr. Derek Reid thanks for joining me today on the behavioral observations podcast. How are you doing today. Great. How are you. I'm doing fine.

Matt: [00:03:59] I have been wanting to have someone on the show to talk about behavioral economics and I've been told by some mutual friends of our friends of ours that you were just the guy to do it. So I am really psyched to have you here on this show. Behavioral Economics is something that was pretty hot when I was in graduate school it was kind of hard to avoid. And there

were a lot of people both in terms of graduate students and faculty members at Auburn who were really into it at the time and so it was like I said something you couldn't avoid but it's not a topic that's I think as prominent as other issues and behavior now also so I want to bring you on to perhaps enlighten some of our listeners and for those of our listeners who do have a background in behavioral economics. Talk about what are some of the applied aspects of these types of you know economic theories of how of responding and so forth. So how does that sound to you.

Derek: [00:04:57] Sounds great. Love to talk about this stuff so I can go on for days I'll try not to.

Matt: [00:05:01] OK. So before we get into that tell me about how you first encountered behavior analysis. You know was it just an in a class or you know tell me kind of the story of how you came into the field.

Derek: [00:05:14] Sure.

Matt: [00:05:15] Like most behavior analysts and pretty much everyone you've had on your podcast my path was rather convoluted. So I had never heard a behavior analysis or I was studying at a community college and was an engineering student and I really enjoyed physics and calculus and hard science and doing laboratory research and cause in fact waffle missing in the physics lab which was really really got me thinking about experimental work and and really enjoyed you know math and that sort of stuff and not most people do.

Matt: [00:05:52] But I loved it and I took the history of math to get a get out of taking calculus. That's actually it would be really fascinating.

Matt: [00:06:00] It was hard. It was I should have just taken calculus and set it up. It was very or it was very very hard. But anyway that's neither here nor there.

Derek: [00:06:09] You know I just really love like the you know the way math can describe things happening in the world that can predict things and eventually I realize I didn't want to build bridges or design roads. And in my sophomore year I took an intro psych course and the instructor made a comment you find yourself at a mall or at the airport and you just sit and watch people and try to figure out why they do what they do. Then you might consider going into psychology. And so of course this is the semester before I'm transitioning to university and I decided change my major and went to state university my junior year and realized really quickly that I have to get a graduate degree in psychology if I want to have a job.

Derek: [00:06:53] Absolutely. And so I kind of panicked and tried to join any lab that would take me.

Derek: [00:07:00] And serendipitously I ended up in a non-human lab with Valerie farmer Doogan and she was doing some really cool rat research with cocaine some ideal for redistribution matching last stuff very basic.

Derek: [00:07:15] I ended up in Tom Critchfield human operant lab the same semester and we were studying choice and decision making delay discounting matching or with humans. And I also ended up being a behavior therapist in an autism clinic. And again I never heard a behavior analysis and found myself basically doing the entire continuum of behavior analysis. My first semester in psychology. Wow. So it just turned me on and it just made sense. And the rest of psychology you know we're learning all these theories and explanations for why people do what they do. But always going back to this very simple parsimonious behavior analytic approach made a lot of sense. And I remember Tom Critchfield taking me aside one day and saying you know hey you mentioned you

were an engineering student before there's this whole area of behavior analysis called the quantitative analysis of behavior. Boy. Yeah. And I was like oh cool. And it was a way to like take what I learned in engineering and apply it to behavior and it all made sense. And so from there on out. That's what I decided to do. And that's what I've been doing ever since pretty much I had stints in clinical work.

Matt: [00:08:25] But now I'm right back at it you know it's not uncommon for I think some of the folks mainly in the EAB world to have engineering backgrounds and have that same kind of aha moment in applying that quantitative perspective to behavior now.

Matt: [00:08:46] So I can think of a couple of people that were you know who were professors at at Auburn and also as an undergraduate at the University Hampshire couple of the folks I studied under there you know were so it's more it's more than just an anecdote I think. I think that there is some you know if I think if you hang around school of this probably you know you know guys like Randy Grace Tony and Chris Newland you know all those guys Jack Maher I think if anything I may be mistaken about that but a lot of those guys were engineering majors and somehow found their way into pay for analysis for it so I think that would ever hear someone have that background.

Matt: [00:09:29] It reminds me of that. So. So Tom's the one who kind of turned you on to all this.

Derek: [00:09:36] Yep yep absolutely. He's a great guy great mentor great analyst.

Matt: [00:09:42] I took some courses from him. And you got a chance to hang out with them a lot before he went. He was at Auburn before he went up to Illinois. Yes I like that he's a he's a he can get you pretty psyched up about stuff. So it's sort of an attribute of his cool. So where do you end up doing your graduate work.

Derek: [00:10:04] I went to Syracuse University and studied school psychology at the time. I really wanted to do the quantitative stuff but I also wanted to address issues of societal importance and being applied behavior analysts. And back when I was looking at graduate programs Brian Martyn's at Syracuse was doing some matching law research in the classroom. And so it was really the only place I could find that had a pretty rigorous applied element but also was interested in translational quantitative analysis. So I ended up there and spent a few years at Syracuse did my master's degree on the matching law my Ph.D. was on delay discounting with children and everything we were doing was basically applying it to classroom behavior and academic related behavior. So was kind of neat translating what we were learning in school psychology to kind of these basic you know EAB sort of phenomena. And so that is where I you know basically took the course work to become a board certified analyst. So I basically you know my backgrounds went all over the place which has been fun but you know I don't do anything related to school psychology anymore which is kind of odd.

Matt: [00:11:19] And so people look at my CV and like wow you don't know who you are so that they don't they know you're productive because you know you're you're a young man and you're in your CV is about the size of the Concord New Hampshire phonebooks.

Matt: [00:11:35] So at the very least the they know you're not a slacker. So and So you're at the University of Kansas right now correct. Yup. Cool cool. And how long have you been there.

Derek: [00:11:49] Been here since Fall 2010. And fortunately they had a there was a position open for a developmentally oriented behavior analyst. So my wife and I are both in clinical work at the time and thought Wow an opportunity to work. You got to try this. We're able to in clinical work in developmental psychology and we both applied to compete with each other. So I was kind of rough

that is.

Matt: [00:12:13] And that's odd that that yes that made for some interesting dinners or something in contingency planning what are we going to do.

Derek: [00:12:21] One person gets the job. And fortunately Heming big loss to kill you. But Greg Madden left and went to Utah that same year.

Derek: [00:12:29] And so it opened up a second position and I am doing basically a more human oriented version of his line of research and so that created a new position and we were able to both get scooped up.

Matt: [00:12:43] And just to kind of fill in the blanks for some of the listeners Greg Madden is one of the names in behavioral economics right. Absolutely yes. OK. All right. So just so that's just to kind of point out then that perhaps the natural opening if you will for for your work. So cool.

Matt: [00:13:03] I want to kind of return to your work at Kansas but before we get too far into this conversation what I'd like to do is acquaint the listeners to some of the basic behavioral economic terms because that is kind of what I want to talk about or least that's the topic area want to kind of you know kind of tee off of if you will so if you can kind of give us a tour or an overview of what behavioral economics is and things like that and then we can kind of a new a couple of different directions.

Derek: [00:13:33] Sure absolutely. So behavioral economics is this catch phrase right now and a lot of psychology social psych and or experimental psych. And it means something very different to traditional psychologists than it does to us. Operant psychologists. And so when you hear behavioral economics being discussed in more traditional psychology what they're looking at is this idea of you know bounded rationality or irrational behavior. And you know there's very prolific authors like Dan Ariely with Ted Talks on you know being predictably irrational and it's this whole idea that humans have cognitive biopsies or you know these decision making systems that you know inner inner interact with the environment and cause us to do strange things. Well the general premise and way where I think we might have some overlap is that there are environmental influences that cause you to deviate from what you'd expect. And so for instance you know if we think about the value of a dollar it does we think about it being delayed over time. You would think that if we were completely rational human beings. Number one it wouldn't ever get devalued retain its value. Number two it does become devalued over time. It would happen in a linear sort of function. But that's not what happens at all. And we'll talk about delay discounting it a bit but we find that humans don't behave like they're human calculators rather you know we have very complex reinforcement histories and our biology interacts with our decisions and so we do engage in irrational behavior.

Derek: [00:15:14] But the difference is when we're talking about behavior analytic approaches behavioral economics we're not looking at you know these kind of mysterious cognitive biases or these sort of latent decision making systems. All we're looking at is the way the environment is structured and how these constraints on reinforcement will change the way we access our environment. And so when we talk about it in behavior analysis what we're really studying is the effects of constraint on reinforcement. And you can manipulate different dimensions of reinforcement. So quality of a reinforcer the effort the delay the density at which that is being delivered and we know those can impact behavior. So behavioral economics is all about modeling how that works. So we can stack the deck to make sure our treatments are most efficacious. So you know one place to start is to focus on what we call demand and that's basically how organisms value certain commodities and behavior analysts who do behavioral economics we're not as focused

on rate of behavior as we might typically see in the journal *Applied Analysis* in terms of the dependent variable. We're more interested in consumption of reinforcers. And there's many reasons for that. It's complex it's beyond the scope of talking about it today. But the idea is if we look at consumption of re-inforce reinforcer we're better aligning with kind of traditional approaches to economics. So behavioral economics is where we take these ideas from micro economics so like the very simple principle of law and demand and then apply it to what we know about human behavior. And so consumption of a reinforcer mimics the consumption of goods and in our economic system. So that's kind of a nice segue to to make sure that we're studying the same sort of phenomena.

Derek: [00:17:16] And when we're looking at consumption of a reinforcer what we're trying to figure out is how an organism human or non-human will defend its baseline consumption. The idea here is if you provide an organism with a low effort low cost reinforcer how much of it will they take. And that kind of tells us our basic you know the complex name would be the hedonic asset value. But the idea here is that it. It's just like you know your demand intensity. How much do you value this. If you can have it for free. And so we complot that and then we can start layering on different constraints on a reward and we can see how an organism defends its ability to access that reward. And so what we do is we start manipulating unit price and so we can place a unit price sort of contingency on a behavior. And so unit price is basically your cost benefit ratio of a reinforcer.

Matt: [00:18:17] So that will be like if we're talking about you know the schedule of reinforcement terms that would be how many responses per unit of reinforcer.

Derek: [00:18:29] Absolutely. And so all you're doing is taking you know the the requirement divided by the number of units that you're accessing and so typically you know if you're earning 1 unit than unit price is simply equivalent to the ratio requirement or the work requirement. The requirement that you're imposing but sometimes things get more complicated where you might earn a couple of tokens for doing four math problems. And so when you have a system like that that unit price would be for math problems divided by two tokens so then your unit prices too. And the interesting thing about unit price is that we find that humans and non-humans both are relatively insensitive to us you know unit price when it's held constant. And so if we have for graphing and we say you know what are the effects of giving one token for two math problems versus four tokens for eight math problems and rearranging the contingencies that way we see that they don't really change. So unit price is kind of a you know it's a standardization procedure to look at how a reinforcer might operate. And so that's a that's helpful in many ways because we can manipulate unit price by either increasing a requirement so we increase the number of math problems or students expect to do to earn one reinforcer or we might actually change unit price by changing the amount of reinforcement that's being delivered and holding the work requirement constant. And so unit price is a very simple way to just kind of categorize what the contingency is. And so we plot out different unit prices so that unit price increases in a demand curve.

Derek: [00:20:10] And what we see is how the consumption of a reward changes as unit price increases and what we see is that early on small changes in unit price don't really affect responding. So think about purchasing gasoline at the guy.

Derek: [00:20:26] I was just going to mention that it's a classic it was just like the what about a year and what happens is you know they're incremental price changes.

Derek: [00:20:34] It doesn't really change your behavior all that much. So when that's happening your behavior is considered to be in elastic. So it's not changing as a function of unit price so you're persisting in defending your access to that commodity. But eventually the law of demand from just straight economics will tell us eventually that unit price will hit a point where it will change your responding and then your behavior becomes elastic your consumption becomes elastic meaning that

a unit change in reinforcement is met with a greater than 1 unit decrease in oh sorry greater than one unit decrease in consumption is happening when there's only a 1 unit increase in the effort or the unit price. And so what's happening is the demand starts to drop very quickly.

Matt: [00:21:24] OK so what will be a qualitative way to just describe what you just said.

Derek: [00:21:28] Sure. So I think it this way and the the technical term for this is unit elasticity. So that's basically that price point where your behavior goes from inelastic to elastic. And so if you look at the demand curve it's usually a flat line and then it slopes downward very quickly. Okay.

Matt: [00:21:46] So what would what would be plaudit on the X and Y axis of the demand curve.

Derek: [00:21:51] So on the x axis we would have unit price and on the y axis we'd have a number of reinforcers consumed. And now the important part of understanding a demand curve is that we usually plot it and log coordinates and that always confuses people and complicates things. But the idea here is that you make you want to make sure that you're putting reinforcement and the effort on onto the same scale.

Derek: [00:22:17] So that way you could see how does a one unit change in reinforcement of the contingency effect a one unit change in consumption of the reinforcer. And so we want to try to find that balance. And so a way to think of it is if you are to think about the slope of the line as it goes across when it hits negative one. So you're a one unit increase in price is met with a one unit decrease in consumption. That's the that's what we call unit elasticity or PM X is the really technical term. Well that's the point at which your year demand goes from an elastic to elastic.

[00:22:55] So if I were to say I know this is so tough to ask you these questions on an audio format so I apologize. But so far just think about this. You know basically an inelastic consumption would be kind of like a straight line kind of going up. And then once that line starts heading south once it turns or once it starts bending if you will and consumption starts going down that's when it becomes elastic is that the Reader's Digest version of that pretty much so the it's elastic it's a almost a horizontal line.

Derek: [00:23:31] So it's just kind of chugging across the number of re-inforce are consumed is not decreasing but eventually it does. And it kind of takes a nosedive. And that point at which that inflection point where it takes that nosedive is what we call unit elasticity and that's that point is actually very important because that tells us kind of a target for setting contingencies. So if you want to think about you know token production schedules and you want to say you know how much baking Can we get for our book how much behavior can we get for this child to be motivated to earn one token the demand curve will tell us that and we could see at what point they might stop responding because the contingencies are just too high. And this way you can kind of map out and strategically set your contingencies so that you're not you know overestimating your contingencies you're not underestimating how much work you can get. But you're really isolating that point at which you're going to get the most bang for your buck.

Matt: [00:24:33] So you're not you're not giving away the farm on the one hand or on the other hand you know inducing ratios strain Yep.

Derek: [00:24:40] Exactly. Exactly. All right. And so if you're sending a contingency that's way left of your of your point of elasticity then you're not getting as much behavior out of the organism as you could. They are willing to admit a lot more responding than what you're asking them to do. And so you know that's kind of a lost opportunity. So we want to make sure that you're maximizing that relationship.

Matt: [00:25:11] And so for practitioners who are listening to this as they're you know you know maybe driving around their cars or at the gym or walking their dog or whatever. What would you test this by just progressively increasing the schedule of reinforcement.

Derek: [00:25:28] Good question there's there's actually some debate about this. Progressing in a kind of what we call progressive ratio where you might earn a reinforcer and far one and then we increase the requirement to an up or two men earn a re-inforce of the year go up to an F or four. And so that's what we might do in a progressive ratio schedule. There's some debate about whether or not that's a good idea to do with vulnerable populations because you're basically trying to induce extinction at some point you're checking the boundaries of that which in some ways might just be you know.

Matt: [00:26:03] Evoking problem behavior and putting someone at risk.

Derek: [00:26:07] And so another way to do it is just to basically sample you know on day one different if our schedule so different ratio requirements to earn a token and see what you get and basically across sessions or across days just kind of randomise which ones you're doing and then plot them where unit price is going up and see what you find. I you know I always want to make sure that people know I'm not advocating that we're asking practitioners parents caregivers to go out and start doing quantitative analyses behavior and fit exponential functions.

Matt: [00:26:42] No that's that's not necessary at all. Yeah I was a liberal arts major So that makes me feel very very good so yeah.

Derek: [00:26:51] And so just graphing it and visually looking at it and seeing like OK well when the ratio requirements are over here on the left side of the demand curve there earning lots of reinforcers. But once it gets to a certain point they're not earning anymore. So that might tell me I need to test out another unit price for that token or that reinforcement contingency somewhere in the middle to see you know how we can fill in those gaps. And it basically allows you to kind of titrate back and forth until you find that sort of perfect contingency that's going to get the most behavior I see.

Matt: [00:27:25] Cool cool. So what are some other concepts from behavioral economics that the practitioners should be aware of yes.

Derek: [00:27:35] So one of the one of the big ones that we talk about is delay discounting or discounting in general. And I know that's been discussed in the show previously.

Matt: [00:27:44] And very very briefly so feel free to use more than indulge.

Derek: [00:27:50] So basically the idea of discounting is that rewards are diminished because they're delayed or the probabilistic.

Derek: [00:27:58] And so we're talking about delay discounting. What we're seeing there is that as the delay increases a reward value will decrease and as I mentioned earlier it doesn't happen linearly. Instead it happens in this hyperbolic function.

Matt: [00:28:11] And you know who who cares about that.

Derek: [00:28:14] Well it's interesting because we find it basically across organisms that there's a sort of hyperbolic decrease in value because of these delays are probabilities. And this is very

important because this allows us to kind of rectify this idea of preference reversals. And I'll explain an example of that in a moment. But this allows us to understand how this process is working and this allows us to then better conceptualize treatments that involve delayed reinforcers. So this whole idea of a preference reversal.

Derek: [00:28:49] An example of this that's perhaps very timely at least this for me because of all the candy I have sitting around Halloween.

Derek: [00:28:56] So suppose someone offering you one Reese's Peanut Butter Cup today and two tomorrow like right now someone did that I would take one and whatever I don't want to wait for tomorrow I'll just have one right now.

Derek: [00:29:09] However if you were to ask me Would you take one peanut butter cup in 365 days or two and three hundred and sixty six days. I would say all but one day difference. I'll take two. And so there's a switch in preference there and the the relative difference is the same. It's one day difference between one or two. But when you add that additional delay in front of it you see that it basically switches your behavior. And this is because this hyperbolic way that we value things and that's important to recognize because we can't assume that things like tokens are going to retain value when the token exchange might be delayed. And so for my dissertation at Syracuse and school psych we did a classroom management procedure and we looked at whether or not this classroom management procedure for being on task differed with children if the tokens were available at the end of the lesson or available just 24 hours later and we had actually done a monetary delay discounting procedure where we ask questions like Would you rather have \$50 now or a hundred dollars in a month.

Derek: [00:30:23] And you know you can assess how people make their decisions what they value the smaller sooner rewards are those larger later awards. And so we were able to find children who were high discounters so very steep discounting meaning value goes down very quickly. So they're more quote unquote impulsive.

Matt: [00:30:40] OK so that would be kind of one operational definition of impulsivity.

Derek: [00:30:44] Absolutely so yeah.

Derek: [00:30:45] The preference of a smaller soon to reward over a larger later reward and then kind of the flip side of that if we were to operationally define his personality construct of being self-controlled. It's the idea that we're delayed rewards retain their values relatively well.

Derek: [00:31:04] And so if offered the choice between a smaller center wart or a larger later award people with more quote unquote self-control will choose that larger later reward.

Matt: [00:31:13] Now within an individual is there any research that suggests that they discount different commodities differently or is it a unitary type of way of. Interacting with reinforcers in other words they you know if looking at you know candy versus alcohol versus what you know I did you know I just kind of popped in my head but I just kind of. Is this a universal type of thing or. Or how does that work.

Derek: [00:31:47] Yeah. The research is really starting to come out about this topic of is it a state or is it a trait. Is it a commodity specific.

Derek: [00:31:56] And yeah I guess the commodity specific thing is really what you would would money be you know different than candy riches. You know I don't know.

Matt: [00:32:06] Craft beer. Yeah.

Derek: [00:32:10] It's it seemed like a simple question and people were finding that yes certain reinforcers primary reinforcers were discounted more steeply and so things like food water shelter things like that are just kind of steeply so basically people want to hoard that stuff right now. I don't want to wait for the future because perhaps from an evolutionary perspective doing that was not a good idea. Yeah. As things that you know arent you know they're still valuable. Right. Money for instance that is discounted less steeply than say primary reinforcers.

Derek: [00:32:49] But someone who is discounting one steeply is likely to discount the other steeply as well maybe not as deeply as a primary reinforcer. But we see that discounting is kind of this the phrase that we use it's a trans disease process. So if you're you know very impulsive with money we also can find that you are very impulsive when you're making decisions about delayed cigarettes or alcohol. And that correlates with all sorts of other impulsive kind of face value behavior.

Matt: [00:33:22] So you know people have found that I was going to mention our mutual friend Steve lawyers us risky sex risky sex. Absolutely. The study showed back up here. OK. Add some context I guess. Yeah.

Derek: [00:33:37] I mean that's also a very interesting line of research that's coming out now is this idea of risky sex.

Derek: [00:33:44] So waiting to get access to say a condom. And so Matt Johnson at Johns Hopkins is doing some research on this with people who also use drugs and so might you know carry different diseases because they share needles and finding that basically imposing any delay on a condom will result in someone saying well I just won't use one. And that's that's problematic. So understanding those delays are incredibly important.

Derek: [00:34:12] And so what we're finding if you discount money steeply then you're more likely to engage in these risky behaviors and there's this laundry list that keeps growing that we all use in our PowerPoint presentations whether or not you engage in distracted driving use SPF when you're on the beach use a seat belt. The list just goes on and on and on. And this delay discounting is like the holy grail of a predictor in identifying this behavioral pattern that is associated with pretty much everything bad that anyone started a study with. So it's pretty cool from a research perspective.

Matt: [00:34:50] I got to get my hands on that slide then. That sounds. Yes. Pretty cool. So you know we talked about some some some examples having to do with let's see less than healthy behaviors I guess what about some everyday examples that kind of characterize these principles we know we talked about gas. I know you've you've done some work with indoor tanning do I have that right. Yes. Yeah. Talk a little bit about that. And while you're right it can describe your research program.

Derek: [00:35:27] Yeah certainly. So my lab here at the University of Kansas where the Applied Behavioral Economics lab and when I started here it you is well-known for its history and applied behavior analysis.

Derek: [00:35:40] So you know labs doing high quality work on problem behavior child development and I've always been interested to be able to get nomics is why I wanted to come to you and and become an academic and I realize there's kind of this niche area that no one's looking at which is just everyday behavior and behavioral economics is kind of most famous for what it's done

in behavioral pharmacology and the addiction sciences and kind of helping us understand not only why addictions might emerge but also how you might treat them. And so I looked at this and I thought well you know we have lots of students at K you they engage in lots of dangerous behaviors of behavior analysts aren't studying. So we decided to look at things like environmental sustainability distracted driving indoor tanning is a big one and that one is always kind of weird so I'll kind of back up and explain why we're studying that.

Derek: [00:36:35] One of my students was doing a dissertation on discrimination and generalization gradients and can humans identify shapes that are changing on a computer screen and still the basic stimulus control stuff.

Derek: [00:36:50] And we happen to use moles as an example. So kind of just benign moles that most people have on a screen but they would morph into melanoma and it wasn't a research study on melanoma but it was a research study on generalization gradients and we didn't tell the participants that these were moles. But we were able to show some interesting facts that's not the point where I'm going. But that led us to discover this whole line of research on you know tanning and how it's related to skin cancer.

Derek: [00:37:21] And I was kind of shocked to find in the literature these these you know these statistics so the first time someone engages in indoor tanning before the age of 25 their relative risk of skin cancer goes up by 102 percent.

Derek: [00:37:37] That's that's incredible. And every additional trip to the tanning salon is another 2 percent increase. And we're finding that there are just these absurd rates of indoor tanning and diagnoses that are happening and we hear analysts aren't studying it. And so when we started digging in the literature we found that the number of cases of skin cancer related to indoor tanning is greater than the cases of lung cancer attributed to smoking. So that's a profound. And what's really crazy is that 60 percent of college students use indoor tanning. And so really of yoga and hundreds more are like k you. So what we know the the highest risk factors are being in the Midwest middle income Caucasian white females that are college educated. And so you know the University of Kansas apply be real science department features many of that demographic. And so we do our studies in a lab. We find that probably you know over 80 percent of our participants when they thought some surveys have engaged in ultraviolet indoor tanning. And it turns out that dermatologists are discussing this as an addiction. And so that you know quickly raises some red flags. Well what does that mean. Well there is this theory of behavioral economics that addiction is kind of this interaction between excessive demand and excessive delay discounting. And this is something that warm because coined a reinforcement pathologies model. And so this notion that if you are steeped this counter we know that's associate with all those bad stuff and you access we value an addictive commodity.

Derek: [00:39:18] More than likely what we find in our research is that if you fit that pattern then you have a substance use disorder for that commodity. And so we went through the literature and found kind of examples of this in the dermatology literature about indoor tanning. And now my lab is focusing on kind of directly taking data on this. So we have undergraduates come into the lab and they do hypothetical demand for indoor tanning.

Derek: [00:39:43] So we'll ask them you know how many times do you go to a tanning salon in a month if it was you know five cents to go. So we started increasing the unit price all the way up to like \$600. And we can plot their demand curve for indoor tanning and we find that people have pretty excessive demand which is incredible how much money undergraduates are willing to spend on it or indoor tanning. So we looked at the literature on addiction it's like well what do we know about ways to behaviorally assess some addiction in one area is Hugh evoked cravings are q evoked

motivation and there's some research with cigarettes that if you put someone in virtual reality and show them pictures of cigarettes they will actually have increased behavioral economic demand for cigarettes and the presence of that cue relative to a control condition or baseline.

Derek: [00:40:35] One of our colleagues did a study using this with alcohol and he created a simulated bar at his university. And so we had had people come in and they would go into a neutral room. There would be some posters on the wall some cups of water. They were asked to pick up a cup of water put it up to their nose put it up to the lips put it back down. Look at the posters do this repeatedly and then they're assessed on their demand for alcohol.

Derek: [00:41:00] They then go into another room where it's the same thing except the posters are related to sports teams or advertisements for liquor. It's the simulated bars and other sitting at a bar and instead of it being glass of water it's a glass of beer or their favorite liquor. And so they've got to put it up to their nose. Put up your lips put it back down.

Derek: [00:41:19] So you're basically trying to really get them to crave access to this commodity and they showed that and it increased behavioral economic demand for alcohol.

Matt: [00:41:29] So is that kind of like when I watch the Food Network. Yes. And all of a sudden I rummaging through the cabinet for chips or something like that. That is absolutely yeah.

Derek: [00:41:39] When you see pictures of you know barbecue in your mouth start salivating like Pavlov's dogs. You know it's. That's exactly what it is.

Derek: [00:41:47] And so we set up a simulated tanning salon where we do the same thing and so they you know fill it out in a neutral room and then they round the corner and we have them look at coaster's related tanning so we basically created a fake tanning salon.

Derek: [00:42:02] There's not a panic that but there's a computer that has LCD lights around it and they have to put tanning lotion on their hands and smell it that the lights go off and it's dark. There's these blue halogen lights around them there's a heater that blows against their legs. We have a white noise machine to sound like a tanning bed.

Derek: [00:42:21] And what we have found is that not only are we seeing increases in demand behavior economic demand for tanning. There's also clinical scales on cravings for tanning and those kind of shot through the roof too.

Derek: [00:42:33] We actually had participants leaving the study saying oh I'm really excited to go tanning right now this really made me want to do it. It's like well no please don't do that brochure about why tanning is bad. Just the idea that you know within subjects these things going back to is this a trait or a state you know within subject. We're seeing a simple access or seeing cues that have been conditioned in your environment to be related to the consumption of that commodity. Just those cues alone will elevate cravings and be able economic demand.

Matt: [00:43:08] OK. So I got a question. I've got a question about the hypothetical. Yes is this. But before I get to that. Is there a way to reverse that. You know to abolish those cravings or you know have you guys kind of reverse engineered that or is there anything in the literature that points to all right we can induce this heightened desire if you will to consume this commodity that that is you know perhaps not all that great. Can is it or can you do it in the other direction.

Derek: [00:43:43] Yeah. Yeah.

Derek: [00:43:44] And so you know one way to do that you might typically do with drugs would be to decrease the dose. But in the presence of the same cues until you're you know titrating it all the way out. And so that therefore you basically counter conditioned it with tanning. What we're thinking about doing is you know kind of this the same thing there's these filters you can get that you can put on top of the lamps and it blocks the ultraviolet radiation that comes out. And so one thing that we're hoping to do in the future is to actually have people expose ultraviolet tanning people who are already tanning. So there are some precedents for this and other research and you know introducing these filters and having them you know accessit and kind of wean them off. Some studies have shown that if you do it too quickly with indoor tanning you actually get withdrawal effects so people will get nauseous jittery they'll get headaches. So this kind of suggests that indoor tanning might be addictive in the sense that you're seeing these withdrawal effects when you're kind of blocking that the actual reinforcer which people have identified as actual endorphins that are released when you're tanning.

Derek: [00:44:53] And so the other thing you can do is you know maybe interject some of these cues in more benign situations and make them just kind of less correlated with only indoor tanning. And you know one of the things I think is important and there might be some connection is this idea of you know resurgence in how do we prevent resurgence in behavior when you take a treating behavior and you're treating it outside the lab or in the lab outside the natural setting and putting them back into the environment where the natural cues are there that are associated with those contingencies whether it's for problem behavior self-injury or even you know alcohol use or tobacco use.

Derek: [00:45:33] We see that this resurgence thing can happen. And so. I'm trying to find ways to conceptualize ways to treat indoor tanning from you know a resurgence perspective. So there's been some interesting connections there with EAB and basic research. So it's really fun for me because it's a valid topic. Undergraduates are fascinated by studying this stuff so it's a nice way to bring undergraduates into behavior analysis was something that you know they're exposed to on a everyday basis unfortunately and they can kind of see these principles in action without having to expose them to having you know heroin addicts come into the lab and they can do assessments on them rather you know they're seeing their roommates come in and doing demand and stuff like that. So I say pretty neat and cool.

Derek: [00:46:19] So let's talk about the hypothetical piece. To what extent is the other hypothetical choices how can you not. Obviously it sounds like convenient because of let's look at the like the monetary discounting piece you know a you don't have to pay out those funds and b you don't have the time to wait you know which you know which would you want five grand in you know in a year or you know a year and a month or something like that you know you don't have the time nor the money to do that.

Derek: [00:46:55] But how confident is the literature it as it relates to these hypotheticals versus what is borne out in reality yeah that's an incredibly important question and we get it a lot especially from our behavior analyst colleagues are always skeptical of hypotheticals because we know self-report isn't the best and you know there's there's some research on both alcohol and cigarette consumption where people will come into a lab they do the hypothetical and then they might actually then do another demand analysis where now they actually get a budget and they say you know you're in a walk away today with \$20.

Derek: [00:47:40] You have the opportunity right now to allocate some of that money towards alcohol or cigarettes that you can actually consume in the session. And what they find is that the demand curves look the same. So they're highly correlated.

Derek: [00:47:56] Another way people do it is just like him delay discounting creating a potentially real choice. And so we would say we're into this hypothetical procedure but now we're going to randomly pick one of your choices and you're going to experience that purchase.

Derek: [00:48:12] So we're going to give you again you know 50 bucks for being at the session today. What if you said you're going to spend 40 of it on cigarettes then that's where you're an experience. And so know that when you fill this hypothetical out where it randomly pick one and then we're going to take it out of your budget and what people have shown is that when you do procedures like that they look identical within subject to when you have purely hypothetical. And so there's just like in the latest County it's it seems to be related. But more research is definitely necessary to do that and I think that the hypothetical demonstrating that it works is important but we've kind of started there with a lot of these commodities because it's either you know not very feasible or potentially unethical to expose people to these commodities. So getting my aier be to allow me to have people come in and get in a tanning bed and expose themselves and increase their chance of cancer by a known percentage for the sake of validating the purchase task. I don't know that that's an ethical dilemma. Official already doing it. But what we're doing here is basically trying to show that these procedures are capturing this clinically relevant phenomenon and we're kind of documenting the same sort of effects that you would get. And the EAB labs in terms of how you work with unit price or what you might do in terms of you know what you're presenting to people in terms of the price increases.

Derek: [00:49:44] Now we're showing that those all replicate known effects and now now that we have that we feel that we're comfortable that we're assessing this thing called Demand. But is it really their demand. And that's where we have to step back and try to validate these using real outcomes in some capacity. So the research is still out across the board. I think you know DeLay discounting is a good example. It's still not perfect because it's still all kind of simulated analog sort of environments but we know that it's correlated with things that should be correlated with actual consumption. And so it's a pretty safe bet that this is a good proxy. Is that a perfect proxy. Probably not but it's pretty good. And for the sake of clinical work and clinical approaches to addiction it's working very very well. And so that's why people are kind of going with it even though it's not as validated as behavior analysts would like.

Matt: [00:50:39] Sure. So there's there's a comfort level with that. But if you ask well at the same time acknowledging there's more work to be done. Absolutely. All right cool. So I want to come back to the notion of you know how some of these concepts can be used by what I like to call you know your everyday BCVA you know someone who is you know providing treatment generally to kids with autism or a related developmental disabilities or working in schools and things like that. We talked a little bit about re-inforce or assessment. But the article that you had shared with me that old posts and show notes from behaving else practice mentioned something about you know perhaps incorporating some of these things into functional assessment practices. Can you talk a bit about that.

Derek: [00:51:28] Sure absolutely.

Derek: [00:51:30] One of the things we're finding is that most of what we do in Applied Behavior Analysis and you know it's fine. Some of them I am a board certified behavior analyst so I've done a lot of this work and now I'm doing you know kind of EAB stuff so it's fun trying to bridge that gap and seeing the disconnect is you know kind of profound. So when we typically do a preference assessment or even you know our final analysis we're putting things on basically continuous reinforcement schedules and you know pick one they pick one of the experiences or we create a contingency in the session room where it's you know far one. So you engage in behavior we're going to deliver the consequence. Well what we're finding in the preference assessment literature is

that. Preference hierarchy's will change across the demand curve. So if you're only looking at continuous reinforcement the preferences the preference higher you have is what it is. But as you start imposing different unit prices sometimes these preference hierarchies shift and something that was most preferred is no longer the most efficacious and something that was lower preferred actually retains its value quite well. So it's kind of a weird thing that's happening in preference assessments. So the idea that we could look at problem behavior in this perspective is kind of provocative. I mean I'm not really doing this work but it's something that people could consider. So you know if we look at problem behavior that might be evoked because of task demands. Well what is the actual test. Is it really just one trial.

Derek: [00:53:06] So here do this or could we actually use more of a behavioral economic demand analysis where we try to evoke problem behavior using different ratio requirements or different unit prices. In terms of you know how much work is going to happen before we see problem behaviors start to emerge. And so it's just kind of a more of a heuristic I think for practitioners is to think about the contingencies in a behavior economic way. I'm not expecting that people are going to go out and plot demand curves but we are hoping that people will go out and relook at what they're doing and look at how a reinforcer for appropriate behavior stacks up against a reinforcer for problem behavior. What are the qualitative differences in praise versus a reprimand. You know that could influence how well these things persist as reinforcers. What are the differences in the immediacy of delivery. So again these behavioral economic principles with quality rate effort delay of reinforcement those are happening regardless of whether or not you're studying it regardless of whether or not you are systematically testing out different variables any type of behavior analyst is using a reinforcer.

Derek: [00:54:25] They're. Engaged in behavioral economics principles like it or not. Well so rather than be ignorant let's like let's let's focus on what we know.

Matt: [00:54:33] Sure I could see how having this and mine would inform us you know if you have a kiddo who's working on you know and part of your intervention is some sort of non-contingent strategy whether that's escape your attention or what have you. You know not knowing how much and how much water goes under the bridge if you will how much responding occurs before that before before they have historically acted out to obtain reinforcement. Wouldn't you know that it sounds consistent with certainly the economic analysis. Another thing I was thinking about that what you were saying in terms of the quality of reinforcement of the things I've always thought about is the difference you know just in practice you know you're speaking to lay people you know I was talking about you know is different flavors of attention when we talk about kids who are acting out for their acting out in a positive reinforced by attention and things like that to that whole qualitative factor of whether you know whether it is a reprimand or whether it's you know a mild redirection or you know if it things like that so there's a lot of those factors to consider. So I appreciate you kind of running through those things. I know we are. Is there anything else in that regard at least in terms of either preference or or functional assessment. Before we move on.

Derek: [00:56:00] No I would just I would just caution and say you know this is still just you know fear rising a little bit. And I'm not you know I would never overstep and say I'll go out and try these be overly economic things. Sure sure it's something that we you know applied research might want to start to address and just people we just need to be thoughtful about the principles in action and doing that I think would be an improvement in and of itself because you're using these resources that you know both basic and applied economic research has provided. So it's just another you know attribute that we need to consider.

Matt: [00:56:35] Well I think I think it's I think it's on the one hand it might be a little daunting for folks at least for someone like myself who who is not necessarily the strongest stem student if you

will. But on the other hand I go back to what you said earlier that there is so much there's so many everyday examples of you know these these factors just getting back to the example of gas prices and things like that it makes it inherently kind of fun to kind of you know map these concepts out on to what's going on. So yeah I would agree that you know that doing actual behavioral economic research or are designing interventions around those concepts you know might be you know something we don't want to contemplate right now but certainly keeping those concepts in mind and how they interplay with everything else that's going on is certainly worthwhile to think about. So so I want to ask a kind of a different question going a different direction or longtime listener of this show know that I am one of my areas of interest is acceptance of therapy and I. I'm not sure how familiar are with that stuff.

Matt: [00:57:47] But one of the things I was thinking about is the idea of and I asked this to a couple of guests who are experts both in discounting and act.

Matt: [00:58:03] And one of the things I always wonder about is you know is discounting related to the concept of psychological flexibility. In other words the he could think of people who haven't heard some of the previous episodes on act and can go back and check that out particularly session 6 with Jim Moran. But you know the the idea that psychological flexibility you know high levels of it as you know is measured by various instruments is you know is related to you know thriving if you will and low levels of psychological flexibility you know is correlated with all sorts of you know kind of negative health or mental health outcomes and things like that are you aware of. And so when I start thinking about that the concept of discounting does come to mind. You know if you neglect if you if you're not able to persevere and accept what's going on diffuse You know what. Any type of private events and still work towards in a committed way towards long term values. You know that that is one way at least in my view. Thinking about self-control. Right.

Matt: [00:59:21] Yeah I think some great examples of this actually and when you had Erin Rassmussen on sessional Levin she was very good very good.

[00:59:31] Jim I was there. Yes. The passion of her in everything.

Derek: [00:59:36] Now she's she's done some cool research in this regard the mindful eating. Yeah. Very neat. There's some research out of Utah State University looking at acceptance space procedures and self-control. So those are more like explicit direct systematic accounts of this. So it does suggest that you know kind of taking a mindful approach and being present in the moment to the contingencies does help your self control which manifests in these studies as improved discounting.

Derek: [01:00:10] There has been some other studies on this and I don't remember the exact citation but I know James McKillop was one of the authors and it was a kind of a review paper going through things that correlated with impulsivity. And while there weren't a lot of direct studies relating psychological flexibility to delay discounting they all seemed to correlate with the same stuff. And so I thought that was kind of neat. And so they've actually shown that certain traits and I don't exactly remember what they are.

Derek: [01:00:39] We're correlated with psychological flexibility as well as DeLay discounting and sort of you know kind of that inverse sort of relationship so high highest psychological flexibility those people also seem to have. You know but that profile is also related to lower impulsivity. And so I think there's hints of this.

Matt: [01:01:00] You know it makes me wonder like you know if you put them through an act protocol for you know X Y or Z would match and you did a pre and post kind of discounting task or

procedure you know would you see change in both that and say measurement on the a cube. I think that's what it's called I forget what they used to measure psychological flexibility but it will be an inch. I don't know if that works been done. I think one of the studies you mentioned is one of the ones that Aaron referred to in our discussion. But you know it would perhaps elucidate whether or not these things are stable these so-called personality features or malleable.

Derek: [01:01:48] Exactly. And I would I would put money on them being related and that improvements in psychological flexibility would result in improved away discounting.

Matt: [01:02:00] So now we're just now we've brought gambling into the discussion.

Derek: [01:02:05] Gambling is a big part of discounting to throw out. Yeah and I think that you know if we look at things that act has been very successful in treating those problems are often related to the way wait is coming as well. And so people who kind of enter enter the clinic with those problems are typically shown to have steep rates of discounting. So you know is a correlation because all more research is needed to kind of show that. But I think it should be fleshed out and I I'm sure it's probably there. They seem so related. There's a kind of a related theory with all of this and it's this warm Bickle has a competing neuro behavioral decision theory of addiction and it's the idea that you can get addiction or steep discounting if you either have hyperactive impulsive systems. So now we're hitting the brain stuff. Or if you've got hypo active self-control.

Derek: [01:02:59] So basically an imbalance of one or the other could push you towards favoring smaller center or larger later rewards. And so if we start looking at you know taking the more present focus in delay discounting we see improvements in self-control. So there's been studies about working memory about you know trying to just train your brain to use that loosely. That's been shown to help improve self-control. There's also been some research on something called episodic future thinking which is where you kind of reflect on your values and think about yourself in the future and what you need to do now to kind of retain those values down the road. And when people go through those exercises and it's a very brief just kind of questionnaire that you can provide. It changes the way discounting. And so I think that's very related to this idea of psychological flexibility.

Matt: [01:03:54] Very cool. Very cool. Well.

Matt: [01:03:58] We've talked about alcohol risky sex testing intravenous drug use gambling. So the book that we're coming up on at the time here that we've got booked out for this show before we add anything else to that list. I do want to kind of work and my last question here DERSE has been fascinating. So I guess in terms of my parting question you seem to have a really unique perspective and it is very reminiscent. You could tell that you were mentored by Tom because he does have this kind of renaissance view of behavior analysis knowing a lot about a lot of different aspects of the field so. So given that perspective that you have do you have any words of advice for students of behavior analysis or you know a newly minted BCB someone out there you know just getting their feet wet in the field absolutely I think it's really important to recognize where behavior analysts fit onto inners disciplinary teams or in collaboration.

Derek: [01:05:10] And my work has led me to collaborate with people from all over the place in terms of research. So working with dermatologists on the indoor tanning I work with cognitive psychologists on distracted driving. And it's it's easy to think well you know though this is cognitive psych mumbojumbo. But to really be effective in the Get Heyburn else is out there we have to recognize that we use different language and maybe have different theories about why the same thing is happening. But functionally we care about the same thing and we're kind of hoping to get the same goals and maybe we're interpreting things slightly differently but all too often I see people

get dismissive of things outside of the field. And I think that's unfortunate because we need to get outside the field to really make a difference. And so one way I think students can do that is to talk more with people who are doing interesting research and then maybe not with that person but maybe later with their friends try to re translate that stuff into behavioral principles and behavioral concepts. It's kind of a fun thing to do but it's also I think an important way to stretch the boundaries of what we're comfortable discussing as behavior analysts. We I never thought I'd be talking about hypothetical indoor tanning when I was doing basic research as an undergrad. So that seems so weird. The other thing I would recommend is to kind of get comfortable with reading other disciplines work and it doesn't matter what area behavior analysis you're in.

Derek: [01:06:36] It's important to do that and getting comfortable with statistics I think is unfortunately something we don't train enough and you don't need like a degree in statistics but maybe an intro class would be helpful. We're picking up a stats book just being able to read information about how this other research is being evaluated because you don't want to just rely on the discussion section because people are biased. And what they're saying is just to be able to understand what those numbers mean. It will help you working you know on a on a case reading other people's case reports and understanding what a z score is or what an IQ score represents or something like that. Yeah that's good. That was very important.

Derek: [01:07:17] And I would hope i'm highly involved with society for the quantitative analyses of behavior and I'm a big fan. We offer resources available online for people who want to get more information about quantitative analysis and how it can relate to abs.

Matt: [01:07:36] And so the Society for the quantitative analyses of behavior the website is as. Q A b dot org. And on that site we have some links.

Matt: [01:07:45] We have a youtube page an iTunes account where you can pull up tutorial videos that show kind of the breadth of what quantitative analysis can offer. And this year at ABH I. For people who might be attending. We're actually doing some collaborative panel discussions with applied behavior analysts in the areas of obesity as well as resurgence. So we're getting quantitative basic people literally at the same panel discussion table with 88 people and hoping that really kind of bringing people together in this and the squad board right now. More than half of us have BCBS. Really. Yeah. And so yeah I think it's a it's an interesting time where I think squad is coming around and becoming much more interested in these large scale issues in trying to find ways to bridge the gap with Abiah. We're seeing more and more people attending our conference and hopefully we'll see more of that in the future because there's something there for everybody.

Matt: [01:08:46] Very cool very cool. Well that's good advice so I appreciate that. Derek we'll have to have you on again because I know this is going to generate a lot of questions and so maybe we can do a follow up Q&A episode or something like that or feel free to come back on whenever you have kind of new Divell I think you know just the kind of whole indoor tanning thing is definitely cool. So you know as as results come in and you want to talk about that stuff. The door is always open. So Dr. Derek Reid thank you so much for joining me today. It has been a fun conversation. Thank

Derek: [01:09:25] you so much appreciate it. All right. Take care. Bye. Well

Matt: [01:09:30] guys I hope you enjoyed that interview as much as I did. Some really thought provoking stuff from Derek. You know if you have other questions about this stuff feel free to shoot me an email that at behavioral observations dot com. And like I mentioned at the end of the interview perhaps we can have Derek back on the show for a question and answer or update us on more research from his lab or anything else that's I guess strikes for interest if you will. So again

and feel free to send in feedback. Just me speaking for myself personally this is a pretty fascinating topic. And again I believe that Derek is in a very unique position knowing a lot about a lot if you will in terms of the field of behavior analysis in general. So Also don't forget to check out squad dot org. I believe that squad with out you unlike the the bird but I think that's as Q A b dot org and I would put that in the show notes as well. Yes. Q A b dot org or just double checked. Yeah I'll put that in the show now so you can check those out of behavioral observations. Dotcom. And just look for session 17 and I think I think we'll call the show around. Thanks for listening.

Outro (Kim): [01:10:55] Behavioral observations good folks thank you for listening to the behavioral observations podcast with Matt scoria.

Outro (Kim): [01:11:06] You can find Matt's notes on this episode at W W W behavioral observations dot com. We also invite you to stay connected with us on Facebook at Facebook dot com forward slash behavioral observations and on Twitter at behavior podcast