Episode 15: "Using BI to Tackle Financial and Environmental Sustainability"

with Jiaying Zhao, Associate Professor of Psychology and the Institute for Resources, Environment and Sustainability.

For our final episode of the semester, I'm joined by Jiaying Zhao, who is a co-founding member of UBC Decision Insights for Business & Society (UBC-DIBS) and an amazingly productive researcher at the forefront of applying BI to pressing societal challenges. In sharing some of her favourite projects, Jiaying tells us about the importance of combining lab and field research, the challenges and rewards of working with partner organizations, and tips for encouraging organizations to scale successful results.

Transcript:

KIRSTIN APPELT, HOST: Welcome to this edition of Calling DIBS. I'm your host, Kirstin Appelt, Research Director with UBC Decision Insights for Business and Society, or DIBS for short. Today, we're calling DIBS on Jiaying Zhao. We're, of course, lucky to have Jiaying with us today. She always has an impressive number of projects on the go, so we're fortunate she could squeeze us in.

And of course, you all know Jiaying as an instructor in our program and a faculty member from DIBS, she's also an Associate Professor in the Psychology department at UBC with a joint appointment and the Institute for Resources, Environment and Sustainability. Jiaying is also a Canada Research Chair in Behavioural Sustainability, among many other honours. She does amazing research and I'm thrilled to hear a bit more about some of those projects today. So welcome to the podcast, Jiaying.

JIAYING ZHAO, GUEST: Thank you Kirstin for having me.

APPELT: Can we have you start off by just telling us a little bit about yourself?

ZHAO: Yes, I'm a psychologist. I work on behaviour change.

APPELT: And you did your PhD at Princeton with Eldar Shafir. What led you to a PhD in Cognitive Psychology?

ZHAO: I'm always fascinated with the human mind. And I want to know what, you know, determines our choices. How do we make different choices? That's why I went to Eldar and Dan Osherson and also Nick Brown at Princeton to do my PhD.

APPELT: That sounds familiar to me, and that's pretty much why I ended up doing a PhD in Psychology as well. From there, what led you to a career that's using behavioural insights to tackle real world problems? Because obviously not all academics do tackle real world problems. What led you down that path?

ZHAO: Because I could not sleep at night. I realized that there are many problems in the world beyond, you know, the journals I read, the books I read, that that really bother me on a pretty deep level. So, I mean, I started my PhD working on probability or reasoning. And that was very intellectually stimulating on some level. But I realized that there are other problems, such as poverty and climate change, that kept me up at night and that motivated me to pursue a career on behaviour change or using behavioural insights to tackle challenges in the world.

APPELT: That, yeah, that really resonates with me and underscores a lot of my own reasoning as well. And I think we've got the title for your autobiography, "From Probability to Poverty, the Jiaying Story."

ZHAO: That's a great title. That is absolutely fantastic my first paper is on the provenance of conditional probability. I was trying to figure out how people come up with conditional probabilities in a mind. But as you can see, you know, it's a very kind of narrow, within the lab problem. It's only interesting probably to a handful of people out in the world. And then I think that was my first-year project in my PhD and I realized, “Wow, I should really, you know, maybe broaden my lens and then focus on problems that could impact many lives or actually change policy”. So that's why I also worked with Eldar on poverty.

APPELT: And we're so fortunate that you made that change. And I think one of the things that sets you apart in my mind is that many researchers have a single, major research focus. But you're actually juggling diverse research directions with amazing projects spanning poverty to sustainability. Can you tell us a bit about your lab at UBC, the Behavioural Sustainability Lab?

ZHAO: Sure. My lab uses psychology to change behaviours towards environmental and financial sustainability. So, in a sense, it's targeting real world problems. Some people think it's very applied. But I think it's actually a critical objective of psychology or research, is used to actually benefit society and humanity in some way. My lab tackles mainly, I think two problems. One is poverty, which has to do with financial sustainability. And the second problem is environmental sustainability, issues like waste, pollution and climate change.

APPELT: And I think you've already started to address this a little bit, but maybe you can speak a little bit more about the common threads across your research projects.

ZHAO: The common threads are, I think to me, is the imbalance between resources and demands. That could be physical resources like money, or environmental resources like water, or cognitive resources like attention. I think that's probably the common thread across all my projects.

APPELT: That's a really interesting way to think about those, and I really like that. We might need to steal that for an upcoming grant proposal. And another thing that I love about your work is that you combine lab and field projects. Can you tell us a little bit about that and how those are complementary?

ZHAO: I think that lab and field experiments should be the standard for psychology projects or papers going forward. This means, you know, several things. One is lab experiments are fantastic because they are highly controlled. You can pretty much control any aspect of human cognition, one thing, one factor at a time. So that can lead to several beautiful results or even, you know, pretty big effects in some experiments.

But then the constraints of lab experiments are that one it doesn't reflect real world behaviour, which is messy and complicated. It doesn't reflect the people that we are trying to study, because lab studies usually only involve undergraduate students in psychology. These are, you know, these are the constraints of lab experiments and field experiments can address those issues.

Field experiments involve people in the real world, in a real-world setting. I think that field experiments complement lab experiments. And the nice thing about the combo is that it shows real world relevance, real world impact, but also shows some insight of human psychology that usually comes from lab experiments. I think the combo is really a nice package going forward for psychology.

APPELT: I totally agree. And maybe we could hear a little bit more about that through hearing about one of your favourite projects. Maybe we'll start with a favourite project around environmental behaviour.

ZHAO: Sure. Well, I guess, let's talk about recycling. So how do we encourage recycling and composting behaviours? It's a very specific behaviour. It's always very relevant to people's lives because a lot of us recycle and compost. One thing we did was trying to increase the sorting accuracy. I think this is probably one of the major challenges of recycling composting is we want to do it. We will try to do it as often as we can. But we are sometimes terrible at it. So how can we get people to sort or recycle and compost correctly? So that's the challenge.

A lab study we did was we offered real-time feedback to people as they played a sorting game. This is like a simulation of recycling in the lab. They sort items on the computer screen and we give them feedback right away about whether they got it right or wrong. In the lab experiment, we showed that people can benefit from this feedback. They learned, over the course of a two-minute sorting game, and then they eventually learned to properly sort at the end of the game or even three weeks after playing the game. There's some kind of long-term or longer-term benefit of having the feedback. So that's a lab experiment. It's a simulation of real-life recycling and composting behaviours. And it's only done with undergraduate students at UBC.

So, a field experiment we did after that initial lab experiment was to actually, you know, have residents in Vancouver play this game. And then we measured their, you know, the contamination levels in the recycling compost bins in their building. And we did find an improvement in reduced contamination in the compost bins in actual multifamily residential buildings. To me, that's a clear demonstration of the effect of feedback on sorting accuracy in the lab, combined with a field experiment showing the real-world impact of this feedback intervention on sorting behaviours.

APPELT: Yeah, that's a really amazing one-two combo. And I'm curious, because obviously our students are doing Capstone projects, and we know that real projects aren't always straightforward and easy. Do you have any tips for how you were able to partner with an organization to be able to do the research?

ZHAO: Yeah. That's a great question. I think psychologists or behavioural scientists in general are not trained to work with non-academic organizations or partners. That wasn't in my PhD and I had to learn that you know, as I started my job at UBC, there are several ways of collaborating with partner organizations.

One way is to, let's start with the easy way, is when a partner organization approaches us for a problem. The compost or the recycling experiment I talked about earlier, that was from an organization, a property management company that's dealing with a lot of composting errors or contaminations. They approached us initially and told us about the problems they are experiencing, and asked for our help with addressing their problem. So that's an easier method of collaboration. And I think that usually will result in an experiment, which is a randomized control trial with some data collected in the field. And sometimes that can lead to it actual publication in an academic journal. Not always, but sometimes.

The harder way is, I think, us researchers reaching out to organizations, trying to initiate collaborations. That's harder because usually you have to get, you know, buy ins and you have to get approvals from that

organization and sometimes they are not really interested or they don't have the resources. In those cases, these attempts don't always result in a fruitful collaboration.

APPELT: And I'm nodding along, thinking about certain collaborators we have that will remain nameless, but have raised complications.

ZHAO: But that's a dance. You know, it's like it's a very kind of intricate dance, very much like dating. You know, I think even if an organization is interested in working with researchers, it doesn't really lead to anything sometimes. Especially when there's a change in administration or management, or the company actually went bankrupt. I've had a field that that we're really interested in working on, let's say, energy conservation, and the company ended up going, actually not bankrupt, but being bought by another company. And then the project had to end because of that. It's a very tricky process.

But it's also, you know, I feel like it's a huge learning curve for researchers in behavioural science. Because that's a skill set that I had to learn through experience. There were no clear instructions that I received or training I received as I was doing my PhD. So, yeah, it's an art.

APPELT: Yeah, absolutely. I really wish I had gained the skills as part of the PhD that would have been so useful. But I think it's also interesting because part of what makes behavioural insights unique is that we do partner with so many different types of organizations and each type of organization often has its specific ways it works and challenges. So even just having that toolset, you're still always having to expand it to learn how to work with this different type of partner.

ZHAO: Mm hmm. And each partner is very different. I have I've never had two partners that are almost identical. You really have to consider their needs there, their resources. And in some ways their own personalities. Yeah.

APPELT: Absolutely. And then going back to where we started with research, maybe you can also tell us about a favourite project of yours around the other type of resource scarcity and poverty.

ZHAO: Yeah. So that's a much bigger project, a hub where, you know, we're trying to understand the psychological consequences or the cognitive consequences of scarcity. That, again, is a combination of lab experiments and experiments. One example project that we did was we, in the lab, we demonstrated that people actually showed lower cognitive functioning when they're facing resource scarcity.

We randomly assigned people to have, you know, to face different resource constraints. These are hypothetical scenarios. And then we show that when they're under resource scarcity, their performance on cognitive tests suffered. So, again, that's a highly controlled lab environment. We showed a strong effect in the lab with the restricted sample of participants and to counteract some of these limitations, we ran a field experiment with sugar cane farmers in India in the state of Tamil Nadu near Chennai, where we measure their common functioning before and after a harvest, their annual harvest of sugar cane.

What we found in that field experiment was these farmers cognitive functioning improved after the harvest when they got paid compared to before the harvest, when they were really poor. So that's a nice combo, a compliment to the lab experiments. And that paper, I think, is probably one of the most successful projects we've done and ended up in *Science* a few years later. So that was a successful example.

APPELT: Yeah. That's really amazing that you were able to do such neat replication between such different participant groups, that's fantastic. And what are some new research directions that you're hoping to pursue?

ZHAO: Yes, I'm pursuing two. We actually just got an approval, our grant application on a transformation initiative was just selected to move forward to a full application stage.

APPELT: Congratulations. That's exciting.

ZHAO: Thank you. It's part of the new Frontiers tri-council research collaboration where they're funding high risk, high reward projects. And I wrote a grant application with a large team of collaborators where we're trying to scale a cash transfer model or intervention to reduce homelessness in Canada. This proposal is based on a pilot project that we've just wrapped up in Vancouver where we gave homeless individuals a lump sum of cash and tracked their impact over one year. This is one direction that I think can be very promising. I realize that cash transfer itself is not necessarily a behavioural insight approach because it does alter the incentive structure quite a bit.

But along with the cash transfer intervention, we're offering other BI interventions such as using reminders, giving them, you know, giving them basically, I can say, a resource booklet that offers other options for training or employment and health care. In this grant application, we're proposing again, to use the cash transfer as a major intervention, but we're trying to test a few other BI tools to alleviate homelessness and poverty. So that's one direction.

APPELT: And I think one of the things that's neat about that, as you mentioned, that the cash in and of itself isn't a behavioural insight. But I think it's a nice illustration of drawing on the understandings of decision and behavioural science, that it's not just having the money in and of itself, of what the money can do, but like you said from your earlier research that was published in *Science*, just having the money frees up that cognitive emotional space. So, there is that behavioural science element to it.

ZHAO: Absolutely, yes. It has co-benefits, I think.

APPELT: Yeah, and you mentioned there is two research directions that you want to tell us about the second as well?

ZHAO: Yes. The second one is another grant application, like I submitted recently with David Hardisty at Sauder. In this application, this is actually quite a BI project where we're proposing to build a personal carbon dashboard that will first present a carbon portfolio for each individual. You can actually generate, you know, get a carbon portfolio for yourself. This is the way personalized carbon calculator that we're going to develop. This fills a knowledge gap in people's mind in terms of, you know, how much my carbon footprint is, what I can do to reduce my carbon footprint.

Once you have the portfolio from the dashboard, we recommend, so this is the second BI insight is personalized recommendations. We offer a suite of personalized recommendations tailored to your own lifestyle and your own circumstance that would suggest, you know, oh, you know, to reduce, let's say, 20 percent of your carbon footprint, you can take these actions. So that's the second BI insight.

The third BI insight is we offer people to complete a goal setting exercise where they can set up their personal goals to reduce carbon footprint over the next year. Goal setting is a pretty effective BI tool. And when the goals are set up for each individual, we use another BI tool, which is reminders. We will remind people periodically about their goals and check in with them on their progress. This helps people stick with their goals and actually to move toward their goals over one year.

And then the final one is using social norms. We can, once we have data, as people progress through their norms, and we collect more information about your carbon footprint, then we can tell them, “Wow, you know, let's say 50 percent of our participants, or people in your community, have reduced carbon footprint in the last month”. And that social normative information can also serve to reduce carbon footprint and elicit behavioural change in our participants. These are the set of behaviour insights that we're trying to test in this new climate grant.

APPELT: That's such a great project. I'm really excited to see it proceed. And it's funny for me because I think, you know, reminders are one of those like, so obvious that they'll work, but then they really always work so well that it always surprises me when I use a project where I put in reminders and just huge effect, we all need them. So, not earth shattering, but so useful.

ZHAO: Absolutely.

APPELT: Kind of pulling on this idea of new research, you're someone I always think of as being really up to date on the recent research. What are some new developments in BI that you think are interesting, whether those are new tools, new applications or anything else that's a newer development?

ZHAO: I think you know, BI traditionally, since its inception, has worked on the margins, by that I mean, well, this is actually Sam Thaler's words, not my words. We just nudge little behaviours here and there and show like a five to 10 percent increase in certain behaviours that can be perceived as incremental by others. We're not really making huge changes.

For instance, when, you know, let's say we're not changing policy. We're not changing institutions or infrastructure. To me, this is the biggest challenge as a behavioural insights researcher in an interdisciplinary world where I'm constantly talking to people working on policy, people working on climate technology or renewable energy technology. Their criticism is always well, you know, “Behaviour change is only one tiny piece in the whole pie. We really need to think about how to change a policy infrastructure”.

I think the new direction for BI is to use BI to change policy, to change infrastructure at scale. How can we play a more central role in in development, in policymaking? This strikes me as a new development. There are more BI projects happening at this point that nudge policymakers. That's a great initiative that actually nudge urban planners, that nudge, you know, government officials at different levels. I think that to me, is really interesting and important.

APPELT: Absolutely. And I think one of the things that's been interesting is like these small tweaks, I think have laid the groundwork because you have to get that initial commitment, that initial excitement and agreement about the potential for use, it's hard to just jump in and say there's this new thing called behavioural insights and we're going to try to change policy with it. I think having laid the groundwork over the last 10 years, I think that's an exciting development. Like you said, that's something we can all move towards and aspire towards.

ZHAO: Yeah, I think this is also one of the bigger goals for the BI certificate program is once we equip these, you know, officials, administrators with BI tools and the BI expertise, then maybe in the future they can set up better behaviourally informed policies.

APPELT: Absolutely. We have high hopes for all you listeners. Together we're going to change the world. And so, thinking of BI again, and the BI toolkit, do you have a favorite BI tool?

ZHAO: Yes, but my favorite tool is so cliche is it's just, you know, make it easy. I love that one. I still love that one to date because this one is perhaps the most effective tool I've seen so far.

APPELT: Yeah, and it's like shockingly hard to do sometimes, like even when we're producing our own writings or whatever, you know, our first draft is often not easy. It's something that we all need to remind ourselves of.

ZHAO: And then also what's easy from the choice architect is not easy sometimes for the audience.

APPELT: Yeah.

ZHAO: Something that's like straightforward, yes, obviously this is going to work, but when you run it, it did not work for the target audience.

APPELT: Absolutely. And I think that underscores something we've talked about in some of the other podcast episodes, which is the importance of that context and that user research so you're understanding things not just from your own perspective, but the user's perspective. We got here before on a tangent when I just jumped in to talking about your work with partners, but going back to that theme, we talked a bit about some of your tips for working with partners, and I think that built a little bit on some of the challenges.

I was wondering if we could also talk a bit about when you're working with partner organizations, it's often on an initial trial and then sometimes it can be in my experience, challenging to have that trial actually be scaled up across the organization or across multiple organizations. What challenges have you had with that idea of scaling?

ZHAO: Yes. I think that the number one challenge is just the failure to scale or the reluctance to scale. Now, this does not necessarily mean that the organization doesn't want to, it just simply could be that they don't have the resources to. One project that I worked on was a smart drive challenge with Metro Vancouver. I think we simply provided, you know, a simple dashboard in people's cars to measure their driving performance. So how many hard accelerations, hard breaks you had, how many trips, how long did you travel, etc. This dashboard offered personalized feedback to each driver and actually led to better fuel consumption and fuel efficiency in our drivers after the challenge and I was super encouraged to see the results. This is a simple and nice trial with big effects.

But then I think after my you know, after our presentation to Metro Vancouver, I heard like zero. I heard nothing from Metro Vancouver. I had a hard time reaching them. It's almost like, "Okay, we're done, we had a nice dinner. Bye." I tried probably three or four times over the course of two years to see. “Hey, you know, this thing worked. What's happening after? Are we going to scale it to actually to Metro Vancouver that encourage all drivers to use this?”. Not a single word after. And actually, the paper wasn't published. It was just written as a student report at the end of the project. Because I think, I suspect that there are administrative challenges with publishing government run trials. So that was very disappointing for me to learn.

APPELT: It really is like dating and being ghosted after a date.

ZHAO: I thought we had a good time! No, completely ghosted. This is not to blame the organization. Actually, I still feel grateful that I got to work on this with them. I think there are many reasons why the trial wasn't scaled up or even followed up later on, largely because of, this is my guess is resources from the organization and also priorities from the management. Are the managers actually interested in pursuing this further, scaling this up? Or now they're giving a different priority to work on.

APPELT: Yeah, that's really tough. I'm wondering if you have tips, and maybe I'm thinking of two things: Like are there tips once you've finished a trial to help it get scaled? But also, are there tips for when you're first starting a project? Are there things you can do early on to increase the likelihood of being scaled?

ZHAO: Yes, I think having those conversations early about scaling or even publishing or following up is very useful. And these, for now, when I initiate a project with a partner, an organization, I would bring all of these issues upfront. And I would say something like “I will work on this project, but here are my expectations. I do not want this to be one shot. I want this to be beneficial for your organization and for me and for my students who are working on this project together”. You know, so I think having those conversations early helps.

Of course, it's, again, like dating. You cannot promise to marry them. You know, it's just, that's not feasible. It's not realistic. But I think one, laying out all the expectations from both parties early on is a great tip. And then, I would be checking with them as we wrap up their project. “So, we delivered this product. Great job. But what's next?” I think having that conversation before you wrap things up also helps.

APPELT: Yeah, I think those are really good tips. And like you said, even with the best laid plans, it still can go awry because it is a relationship. And sometimes people have different resources or different needs. Well, this has been really a great conversation and so I'll close with a final question, which is just do you have a message or advice or any thoughts to share with our BI practitioners in training?

ZHAO: Yeah, I think I would say keep trying and learning from the lessons you got from trying. I think that it's iterative learning. I still do the same thing. I follow the same process. You know, when I start a BI project, I actually have some hunches as to what will work. But after the trial, I quickly learn that I was wrong. Then we you know, with resources permitting, I would try again. I would test the next intervention, so iterative learning. That's probably the key.

APPELT: Absolutely a failure of a study to turn out a significant result, isn't a failure of the researcher, it's just part of the process.

ZHAO: Absolutely.

APPELT: Well, thank you for joining us today. It's been really a fun conversation, and I'm always floored by your kind of encyclopedic knowledge of what's new and going on in BI. I hope the students learn some new ways about BI being used for good. And thanks for joining us today, Jiaying.

ZHAO: Thank you so much for having me.

APPELT: And thanks to our audience for listening to Calling DIBS.