2022 Spence Awards Mini Episode: Antonia Kaczkurkin on How We Internalize Disorders

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The recipients of the [2022 APS Janet Taylor Spence Award](#) represent some of the brightest and most innovative young psychological scientists in the world. In a series of mini-episodes, [Under the Cortex](#) talks with each winner about their research and goals.

Today we hear from **[Antonia Kaczkurkin](#)** (Vanderbilt University), who researches the neurobiological mechanisms of how we internalize disorders.

Transcript:

Charles Blue [(00:11)](#)

This is Charles Blue with the Association for Psychological Science. And today I'd like to bring you a special mini podcast of *Under the Cortex*. Earlier this year, the Association for Psychological Science announced the eight recipients of the 2022 Janet Taylor Spence Award. This award recognizes members who have made transformative early career contributions to psychological science. Our first recipient, who will tell us a bit about her work, is Antonia Kaczkurkin with Vanderbilt University, and she has been working to understand the neurobiological mechanisms that help us understand how we internalize disorders. Welcome to *Under the Cortex*.

Antonia Kaczkurkin [(00:53)](#)

Hi. Nice to be here.

Charles Blue [(00:55)](#)

Before we get too into the questions, can you tell us a little bit about your current field of research? What are you most interested in? What's the big questions that drive you?

Antonia Kaczkurkin [(01:04)](#)

So my research really focuses on trying to understand the neurobiological mechanisms that contribute to internalizing disorders. And by internalizing disorders, I mean things like anxiety and depression. So what I do is actually integrate a bunch of different measures, including things like neuroimaging, psychophysiology and behavior, to really develop a comprehensive understanding of the basic mechanisms underlying anxiety and depressive disorders. And in particular, my research has three aims. So I want to understand why brain anatomy and functioning is abnormal in anxiety and depressive disorders. I also want to understand something about the neurobiological heterogeneity that exists within internalizing symptoms. And probably most importantly, I really want my research to kind of contribute to our knowledge about these neurobiological differences to improve treatment outcomes.

Charles Blue [(02:00)](#)

So during the course of your research, have you made any particular inroads what do we know or understand now that we didn't previously?

Antonia Kaczkurkin

Yeah. So this is a very exciting field. There's been a lot of advances in recent years. So one branch of my research that I'm really excited about is using machine learning tools to examine neurobiological heterogeneity in psychopathology. The broader goal of this work is to really advance efforts to define a biologically driven classification system for mental health symptoms. So what this means is that we can use machine learning tools to try and find alternative ways of classifying psychology based on things like the brain. So what we do is we actually take these really fancy algorithms and we give the algorithms brain data. And what we're able to do is actually identify clusters of individuals who share patterns of brain dysfunction using these techniques, and that can help us understand how people actually group into different diagnostic categories. And so the idea here is that we're going to be able to move closer to the truth by actually letting biology tell us where the natural kind of boundaries exist between disorders.

Charles Blue

I'm most familiar with classifications that have to deal really with external elements, how people react, the language they use, the way they behave. So this is turning that inward. This is sort of taking out subjective elements where you could be dealing with different presentations for the same underlying cause. How novel is that? I'm not familiar with people taking that approach.

Antonia Kaczkurkin

This is very novel. It's actually a really hot topic right now. So right now, we are often reliant on the DSM, which is our Diagnostic and Statistical Manual, which tells us whether or not somebody has a disorder. But this book is basically based on subjective symptoms. So we kind of just made up these categories. We determined subjectively that we think these symptoms belong to these disorders, but we never actually empirically tested this. And so this is a really exciting time in the field because we're actually moving towards using more empirical evidence to back up or to disprove these kind of categories. So it's a very exciting time. We actually use a particular machine learning tool called Hydra. And this is one tool that we can use to understand some of the distinctive patterns of neurobiological deficits with internalizing symptoms. And what we've found so far is that there are basically two subtypes of individuals with internalizing symptoms that have completely different brain patterns. And that's exciting. That's something we would never, ever see based on our old approach of just looking at symptoms. So this is a really exciting time for the field.

Charles Blue

I'm going to dive just a little bit deeper into that. Have your results shown that for things like anxiety and depression that they're not necessarily separate, can someone have the underlying brain patterns yet present what would be diagnosed with the DSM as one or the other?

Antonia Kaczkurkin

So that's a great question. So a lot of the impetus for moving towards a biologically driven classification system comes from the recognition that there is a lot of overlap between disorders. So anxiety and depression in particular, are highly comorbid, so they cooccur very, very frequently in the population. And what we find when we look at the brain is that those with anxiety and those with depression actually are more similar in terms of the brain than we would have expected. And so that's really made us rethink how we're kind of approaching classification of psych pathology because of the brain data is telling us that these actually belong together in the same category. And yet the DSM is telling us now they're actually two different categories. So this is a really great time to really understand how anxiety and depressive symptoms differ in terms of the brain. And we're using these machine learning tools to really uncover the ground truth.

Charles Blue (06:06)

That's fascinating. So let me go ahead and just come into my final question then. What are the hurdles that yet remain? Are there grand challenges out there that you really need to solve before things take that next leap forward?

Antonia Kaczkurkin (06:21)

I think this is a time where we're kind of on the precipice here in that we recognize that the DSM, the Diagnostic Statistical manual disorders are not carving nature at their joints. However, we don't have an alternative yet. So we are still relying on the DSM for diagnosis in the clinical field. So what we kind of see as our biggest challenge moving forward is moving past symptom based classification and looking more for these kind of biological classification systems. The biggest challenge there is going to be to try to understand how these biological subtypes that we're finding map back onto symptoms right because it's not really feasible to give somebody a neuroimaging scan to diagnose them. It's just too expensive. So we do need to be able to have shortcuts for clinicians to be able to diagnose in a clinical setting. So that will be our greatest challenge going forward is not only trying to kind of reclassify mental health disorders but to do so in a way that's going to be helpful for the clinical community.

Charles Blue (07:32)

Very interesting. I've been speaking with Antonia Kaczkurkin, of Vanderbilt University, who is also a recipient of the 2022 APS Spence Award. Thank you for talking with me today.

Charles Blue (07:44)

Thank you for having me.

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