



MIND & LIFE

Mind & Life Podcast Transcript

Jim Coan – Our Social Baseline

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Opening Quote – Jim Coan (00:00:04): *The human repertoire for problem-solving is almost infinite—because you have people with non-overlapping, non-redundant competencies and perspectives and skills and histories capable of sharing a goal and moving toward the same end. The Venn diagram is just off the charts, there's so many different circles. And that little vanishing spot where they overlap is like being a superhero. It's our ability to bring our individual uniqueness to a shared goal that makes us absolutely unstoppable.*

Intro – Wendy Hasenkamp (00:00:45): Welcome to Mind & Life. I'm Wendy Hasenkamp. My guest today is psychologist and affective neuroscientist Jim Coan. Jim is a professor of psychology at the University of Virginia, and he's a pioneer in understanding how social connection impacts our emotions as well as our brains and bodies. As you'll hear, he is also a gifted communicator and teacher, and lately he's been pushing the boundaries of science communication into new domains.

(00:01:18) Over the last decade, Jim has developed a set of ideas known as Social Baseline Theory, which I find incredibly compelling, so I'm really excited to be able to have him on the show. His theory turns the tables on what we think about as the 'default state' for human beings, and it has huge implications not only for how we conduct research, but how we live our lives. For me, it's actually been part of a real paradigm shift in understanding how bodies and minds work.

(00:01:47) Jim does a great job of unpacking all this in our conversation, including the fascinating story of how he came to these ideas, so I'm going to get right to it. If this kind of thing interests you, you should definitely check out Jim's podcast, which is called Circle of Willis, and also some of his science comics. (More on that in the episode.) There's links to all of that and lots more in the show notes.

(00:02:11) All right, I hope you enjoy this one and maybe it will give you some new ideas to think about as you navigate your own social landscape this season. It's a great pleasure to share with you, Jim Coan.

Wendy Hasenkamp (00:02:22): Well I'm so, so happy to be joined today by Jim Coan. Jim, welcome to the show. It's really great to have you here.

Jim Coan (00:02:33): Oh, man. Thanks for having me. I'm really excited to talk to you.

Wendy Hasenkamp (00:02:37): I always love to start with some background from the guest understanding how they got into the work that they're doing. So for you, how is it that you came to study brain and mind and social relationships and emotions, and all of the things that you do?

Jim Coan (00:02:53): Well, we've only got an hour... *[laughter]* I started out in research working with John Gottman at the University of Washington in Seattle, and that was my entree into studying relationships. And right away I started studying the way that relational partners regulate each other with emotional behaviors. That was like the mid-90s, mid-1990s, and I had learned about this thing called 'brain imaging' that was starting to emerge at that time. And I didn't have any real options for doing that, but I knew I wanted to move in that direction, and so I had to leave the Gottman lab. I had to go somewhere else to find that option. And that other place was the University of Arizona, where I worked with John Allen and others to learn about brain physiology, particularly prefrontal cortex physiology, while also becoming a clinical psychologist. And while I was in grad school studying the brain stuff, I always wanted to bring it back to couples somehow, but I couldn't really find the way to do it.

(00:04:09) Then as part of my clinical internship, I did a full year of full-time clinical work at the Tucson Veterans Administration Hospital, and worked with World War II era veterans who were suffering from late onset PTSD. And one of my veterans who had been through an absolutely horrific experience—they all had, but this one was bad enough that it included things like a war crime and other really dreadful things—and he wouldn't talk about it. And so we couldn't commence exposure therapy. And at one point he asked if he could bring his wife in with him, and I was like, "Yeah, okay." And he did, and he got stuck at the point of recounting his awful experiences in World War II again until she reached over and grabbed his hand. And then a really fascinating thing happened. You know, you think of hand-holding as a way to soothe somebody, to calm somebody down. But he didn't get soothed at all. When she held his hand, he exploded in negative emotion. He started sobbing like a baby, and started finally telling me what he'd experienced 50+ years prior in World War II that was wrecking his life.

(00:05:35) And a little cartoon light bulb shot out the top of my head right about then, and I thought, what just happened? What was the change? She's sitting right there. She's listening to all the same stuff that I'm listening to, so that's not the channel. What's going on here? She reached over and grabbed his hand. And furthermore, how exactly is that regulating him? Because he didn't calm down, he became more explosively emotional. What's the story here?

(00:06:08) So I kind of I put that on my psychological shelf for a while until I went to do my postdoc with Richie Davidson over at the University of Wisconsin, and I proposed this insane study to him. And it was insane for a couple of reasons. Well, first of all, I'll tell you what I wanted to do. I wanted to simulate this experience I'd had clinically in the scanner. I wanted to put people in the scanner and have people hold their hand while they were under stress. And that was weird because by that time, nobody had had another person in the scanning environment while someone was getting scanned. And many people thought it was not something that was actually possible because it would distort the imaging or something. (It didn't have any effect at all.)

(00:06:53) But the other reason that it was bonkers was that Richie wasn't particularly interested in relationships, and then there was the odd fact that I had still never, ever in my life done an MRI study and had no idea how to do it. So those were three compelling strikes against. But when I described what happened with my patient at the VA, I think I saw the same little cartoon light bulb shoot out of the top of his head, and he said, "Do it." So I did. And that led me to really the whole rest of my career. I've been running these handholding studies ever since, one after the other, varying them in various ways to get down to the core. But that's why I'm sitting here talking to you now. *[laughter]*

Wendy Hasenkamp (00:07:46): Well, great. And I think it's so interesting that you studied with Richie Davidson who has become a central figure in contemplative science. That's not quite the direction you've gone, but still there's this synergy and lineage history.

Jim Coan (00:07:59): That was just starting when I went to go work with him. And it was funny... there are many wonderful things you could say about Richie, but one of the things that was interesting to me is that I had just published a paper with John Allen revealing that one of Richie's more impactful and famous papers was based on a statistical artifact. And Richie's response was to ask me to be his postdoc, which I thought was pretty cool.

Wendy Hasenkamp (00:08:26): That's very cool. Well, it's obviously led to great things. So let's talk about those early studies and the things that you found going on in the brain when people were under threat or under stress, and then you had people holding their hands. What did you see in the beginning?

Jim Coan (00:08:42): Well, it's funny that you phrase it that way because what really happened—to my very sincere and intense distress—was that there was nothing going on in the brain. That turned out to be both the finding and the problem, initially, because we had a really strong prediction based on everything that we knew about how emotion was regulated at the time, which was that when the person, the hand-holder, reached into the scanner and held the hand of the subject who was under threat of electric shock, it would activate regulatory circuits in the prefrontal cortex that would then regulate more emotion-generative circuits in the subcortical regions. And we saw that the more generative emotion-related circuits were less active during hand-holding, but our proposed mechanism, the prefrontal cortex, was also less active.

(00:09:42) And if that sounds a little esoteric, well, here's the issue. As far as we knew then the prefrontal cortex was the mechanism of emotion regulation. And in fact, for many purposes that's still the understanding. But there's a little asterisk there, that my lab has tried to place in the literature. The prefrontal cortex is the mechanism of emotional self-regulation. When you have no one there to help you, you have to recruit your prefrontal cortex in order to regulate your own affect. And not only your affect, but your cognition, your ability to lift things... it's a lot more generalizable than we thought at the time.

(00:10:33) But when I was first designing this study, I thought, well, I'm going to show that the prefrontal cortex is the mechanism of social support, because we've known for all these decades that people in close relationships have better health and well-being outcomes. And I was like, well, I'll nail the mechanism down and then I'll get a publication in Science, and I'll be super famous, and my career will be set. And instead, the prefrontal cortex did exactly the opposite of what we predicted, and I had no explanation for that. I didn't know what to say about that. I had no story queued up. There was no backup plan. It was a complete 180-degree disconfirmation of my central hypothesis.

Wendy Hasenkamp (00:11:23): So it's like, you would've expected that the emotion circuits would be heightened under threat and then the prefrontal circuits would activate to calm down those emotion circuits.

Jim Coan (00:11:34): Exactly.

Wendy Hasenkamp (00:11:35): But what you saw was the emotion circuits were calm, but nothing happening in the prefrontal [cortex].

Jim Coan (00:11:40): Yeah, and so was the regulatory circuitry. So what in the hell was going on? It was like, the way that I thought about it at the time I told my friend, distressed, in possibly a barroom setting, was that it was like, "What, the hand of God is just regulating the brain now? Where's the mechanism?" We actually—I'm not supposed to say this because real scientists don't do this sort of thing—but in my desperation, we went on a complete fishing expedition with the brain to try to find any circuit that was at once more active during handholding, and was inversely associated with activation of these emotion-generating regions. And we found nothing. And we've found nothing ever since. And now we've done many studies and replicated this finding over and over and over again. In fact, the region of the brain that's often the most impacted by the handholding intervention is the dorsolateral prefrontal cortex, which again, going back to that original prediction was exactly the opposite of what we were supposed to find.

Wendy Hasenkamp (00:12:45): It's down regulated, you mean?

Jim Coan (00:12:47): Yeah. It was extra frustrating for me too, because the last thing I wanted to do was just show that you're calmer when you get your hand held. Who doesn't know that already? When I got into the New York Times following that first study, they were like, "Oh, it happened in the brain." My other mentor in grad school was Lee Sechrest, and he was a methodologist, and he would've really been upset by that New York Times headline because he would've said, "Well, where else is it supposed to happen?"

Wendy Hasenkamp (00:13:18): Exactly.

Jim Coan (00:13:19): I called up my mother and I said, "Mom, I'm in the New York Times!" And she said, "Great! Wow. Holy crap. Why?" And I told her that I had found that when you got your hand held that you were less reactive to stress. And she did a long, uncomfortable silent pause on the phone with me. It was one of the old style phones with the line attached to the wall. And she goes, "That's how you got into the New York Times?" That was my mother's response, *[laughter]* and she said, "You should have called me first before doing that study because I could have saved everyone lots of time and money."

(00:14:00) And we did send it to Science, and the note that came back with it—with the resounding no—was, "Where's the mechanism?" So we weren't the only ones that were puzzled by this. And it's taken us a long time to understand what the mechanism might be, because it's so different than certainly what was mainstream neuroscience of emotion and emotion regulation at the time, but in large measure even still today. Because we don't really know how to explain that you have an effect on the brain that's not also through the brain. I hope that was not too full of esoterica, but it's hard to describe.

Wendy Hasenkamp (00:14:50): It is, and I think the way that you frame it is a really good explanation, because it is not the way that... In traditional neuroscience, there must always be this brain region affecting this other brain region, and-

Jim Coan (00:15:03): Right, it's the billiard balls up in the brain.

Wendy Hasenkamp (00:15:06): Yeah. If not that, then how have you come to understand this effect?

Jim Coan (00:15:11): Well, there were two things. First, I gave a version of a talk of this early work when I first came to the University of Virginia, and in the audience was senior colleague and mentor, who's become a really a good friend named Denny Proffitt, Dennis Proffitt. And Proffitt had done these

amazing studies where he showed that your perception, for example of the slant of a hill, changes as a function of how much energy it's going to cost you to go up that hill. That somehow the brain is able to track—and we still don't know how—it's able to track how much energy's in your body, in your bloodstream. And it changes its estimation of what your body's capable of, given that assessment of what it thinks your energy load is and your energy store.

[\(00:16:05\)](#) That's a little esoteric too, but it's really pretty fascinating because what it means is if you put someone in front of a hill and ask them how steep it is, they almost always overestimate the hill. And that's because your brain, on balance, is always trying to talk yourself out of walking up it. It would just be easier to not walk up the hill than it would be to do that.

Wendy Hasenkamp [\(00:16:27\)](#): Right. Save some energy.

Jim Coan [\(00:16:29\)](#): Right. And he would put these heavy backpacks on people and find that hill estimates would get steeper. That's because the brain's now like, "Now you really have to have something awesome at the top of that hill before you should walk up it because it's going to cost you more metabolic money."

[\(00:16:44\)](#) Anyway, he introduced me to a whole field that I kind of feel like I now belong to. It's taken me a while. I feel like I had to earn my entree into the field, but it's behavioral ecology. And this is a field where... it's like the older school version—more credible in my estimation (that will upset a lot of people)—to evolutionary psychology. It frames the study of behavior in an evolutionary context, but it carefully tries to avoid telling just-so stories about how a behavior evolved, or discussing some kind of evolved mechanism in the brain, a 'module' for a behavior.

[\(00:17:27\)](#) Instead, it focuses on the realities of managing energy, and deciding to take any kind of decision to do anything. Brains have evolved, whether you're a newt or a timber wolf or a human, your brain is trying to make a decision in the face of really fraught uncertainties. Do I go after the piece of food? Well, if I do, that will cost X number of calories, and might expose me to predators. So at what point do I decide to go for it? At the point where my estimation, my Bayesian bet is that the risk of not getting the food is higher than the risk of getting it.

[\(00:18:18\)](#) And this didn't solve my problem, but I started to figure out that maybe there's something about holding hands that's connected to resources and energy, and the brain's estimation of what a body has at its disposal. That still doesn't totally get me out of the mechanism problem, but what it does is it suggests that the mechanism might be something a little deeper, a little more primitive, a little more out in the body. And that line of thinking led me to really start worrying about, well, what kind of animal is a human anyway?

[\(00:19:02\)](#) One of the things that becomes central in behavioral ecology is to understand how a critter is adapted to its environment. And in order to know that, you really have to deeply understand the critter's environment. Well, great. If you're studying salamanders out in the Blue Ridge Mountains—which are fascinating by the way, recommend it, recommend studying those guys—you find very quickly that salamanders must inhabit an environment that is dark and damp and cool, and has access to lots of little squirmy bugs for it to eat. If you don't have that, then the salamander dies.

[\(00:19:54\)](#) But the other thing that you learn about studying an animal in its environment in a lot of detail, as Karl Friston has taught us, is that very often you can in principle reconstruct a critter's whole environment by looking really carefully at the critter itself. What are the elements of a salamander? It's

got this very moist, porous skin. That suggests the kind of atmosphere that it needs around it. What can it tolerate in terms of temperature change? All of these things. Pretty soon you're reconstructing the environment that it's adapted to. So it's really important. If you want to understand the critter, you got to understand the critter's ecosystem, ecology, habitat.

[\(00:20:41\)](#) Okay. So here I am, still trying to understand my hand-holding studies from this goofy, ill-advised MRI study from years ago, now realizing that as a kind of a Hail Mary, I've got to start doing some real scholarship and thinking about what the human habitat is, if I want to maybe understand what's going on here. And what I discovered was that nobody knows. *[laughter]*

Wendy Hasenkamp [\(00:21:06\)](#): It's so variable, right? Humans live in all kinds of habitats.

Jim Coan [\(00:21:10\)](#): It's insane. The fights that people get in over what our habitat of origin was, like what was our paleo diet, for example? That's all a bunch of hooey, man. And what kind of environment human bodies are adapted to live within. Nothing really works. And as you said, we're everywhere. We live everywhere. We exist on a bunch of different kinds of diets. There is no human diet. There is no human environment, terrestrially speaking. So what's left? One of the things I started to ask was, what are the constants?

[\(00:21:57\)](#) Are there any constants in a human life? And the answer is yes, other humans. When other humans are around, you are like a salamander in your cool, damp, moist environment. That's where you're supposed to be. And this, one day—I might've been talking with Denny, Denny probably suggested this—I started thinking about the way that I called my different conditions in the hand-holding experiment, which were controversial to no one. The alone condition, when you're all by yourself facing a threat, we called the 'baseline.' Then there was the handholding condition with a person you knew, and a hand-holding condition with a stranger. And those were the 'experimental treatments,' in the language of experimentation.

[\(00:22:52\)](#) Well, thinking about these questions of the human habitat, I started to wonder if I had it backwards. What if the baseline reading was the hand-holding condition, as far as the organism is concerned? (It doesn't care about experimental design.) And what if the experimental treatment was the alone condition? And that started placing the findings in a completely different view—because a treatment, in contrast to a baseline, is adding something for the brain to do.

[\(00:23:29\)](#) And I realized like a thunderclap that in psychology, we were (and still often do) think of the subject alone in the testing room as a brain having nothing to do. But what I think we found out was that that is a situation where the brain has more to do than when the brain is in that low-grade social situation. Which is why the way to look at it was not that hand-holding turned everything off. It was that being alone turned everything on, including the prefrontal cortex. Because all of a sudden the alone condition, we realized, was a condition where if there was going to be any regulation going on at all, it was going to be self-regulation—which is another job to do, which is what you need your prefrontal cortex for. So this seemed like an early potential explanation for our seemingly weird findings. The explanation was really that psychology had it backward, not the brain, not our design. I just sort of walked face-first into that brick wall.

Wendy Hasenkamp [\(00:24:41\)](#): Which has huge implications for everything we understand about... brains, at a minimum, and how we've set up all these experiments with people alone.

Jim Coan (00:24:51): I think that's absolutely right. I think there still is a reckoning. When I left to go to the University of Arizona, I had been accepted to be a grad student with John Gottman at the University of Washington, and it was very painful decision for me to leave there. And it was painful for him too, we've remained close. But I just really wanted to get this brain training and I couldn't get it at Washington. And before I left, John Gottman told me that his biggest fear was that I was going to start thinking like a psychologist.

Wendy Hasenkamp (00:25:26): What does that mean?

Jim Coan (00:25:28): Well, here's what that means. I was going to start thinking of individuals as the unit. So a lot of wisdom over there in that guy, but it took me a long, circuitous journey to get there myself.

(00:25:42) – *musical interlude* –

Wendy Hasenkamp (00:26:12): This is fascinating at so many levels, and I love this idea. It has so many implications. One thing that came up just while you were describing that, and knowing a little bit about the setup of fMRI experiments and what that has led to in terms of how we understand the brain—there's generally these two conditions. The experimental condition, and then the 'resting' condition, where you're supposedly not doing anything. And the comparison between these two conditions has led to a massive shift in understanding of what's known as the default mode network, which has come up on the show from time to time. But it's basically a network of brain regions that seem to be more active in this 'resting' or 'not doing anything' kind of state. And so there's been lots of studies about the default mode network and what it's doing and implications in all sorts of conditions. But I'm just thinking, it throws that into a different light too, about... it's a network that's active when you're by yourself.

Jim Coan (00:27:14): 'Not doing anything,' right? (I just put the scare quotes up that your listeners won't be able to see.) We would say that those conditions where you're seeing that default mode activity, that's because the brain has more stuff to do right then, and it's trying to work that stuff out. It's trying to solve problems that are not otherwise often present.

(00:27:37) And so the thing about the default mode network is that it's considered to be in contrast to the activation network, right? You know, here's the other thing that I think we really have to grapple with as a field, and that my scholarship, not my personal research, has really taught me, which is that the brain is never off. Not only that, but the metabolic load on the brain almost never changes. You're just as active when you're sleeping or zoning out watching Star Trek, as when you are solving a math problem. The total volume of blood in your brain doesn't change. If it does, if you get a little bit more, you get brain damage. And if you get a little bit less, you get brain damage, or you pass out. It's about what's being active when, not whether the brain's more active. So part of what's happening in our work is that we're seeing that during the alone condition, the blood is moving to regions of the brain that are solving really specific problems. And if the default mode network is really default mode network, we should be seeing that more during the hand-holding condition.

Wendy Hasenkamp (00:28:56): That's what I was going to ask, if hand-holding changes stuff going on in the default mode [network].

Jim Coan (00:29:02): So, it seems to be less active, if anything. Not more. *[laughter]* More hand-of-God stuff. I don't understand the effects on the default mode network that well, and we haven't published

that. That was work that I did with Greg Siegle at University of Pittsburgh, but we're still noodling around with that, trying to just understand what we've even got.

Wendy Hasenkamp (00:29:24): Yeah, no, it just occurred to me. I'm thinking about, too, this difference between threat and safety—just on a biological level, what that does to our systems. When you described that initial experience with the client, and so much emotional release when his wife was holding his hand, I imagine many people have had that experience. I certainly have, where you're in a really difficult emotional state and a friend is there, and gives you a hug or something and you've been 'holding it together' and then you just fall apart when there's that physical contact or support. And it's interesting to think about subjectively what's going on there. All of a sudden, maybe you feel like it's safe to express those emotions, or...? I don't know, it is a very interesting thing.

Jim Coan (00:30:12): So we've started moving away from talking about threat, which is a very transactional, functional view of stimuli. Well, it's not even... It's a valenced view of stimuli. And we're starting to think more in terms of demand. So the thing is, your brain is a finite energy system that is overloaded with things to do. So the way that it solved that problem was that regions of the brain grant each other short-term loans to flexibly manage your existence in the world. And that's why we can use functional brain imaging, because we can measure the flow of blood around the brain as circumstances cause this region or that to get more active.

(00:31:01) Your body's the same way. Your body has a finite amount of blood, but a very much more rich and diverse set of behavioral possibilities. And the reason that you have that huge repertoire of behavioral possibilities, even though you've only got this tiny amount of blood—like 10 pints or something, it's nothing for all the things that you can do—is that your body parts grant each other short-term loans. This is why you don't want to go for a run right after you ate a big meal, because you need that blood in your gut to digest food. It's an energy-consuming activity.

(00:31:38) So the stimulus is a demand, it makes a demand of you. And anytime... One of the things that we've definitely found, and that other people have found all over the world now, is that when you are the recipient of support, your brain construes that as you being the recipient of resources. And often it is directly translatable to metabolic resources. And you can see that in some of Denny Proffitt's studies. He finds, just at a behavioral level, that if you put the backpack on and the hill gets more steep, and then you have that person with the backpack stand next to their best friend and the hill gets less steep. Well, how do you explain that if the initial mechanism for the backpack studies is that it's a draw on your metabolic resources? Somehow standing next to your friend has replenished some or all of those.

Wendy Hasenkamp (00:32:37): Yeah that's so cool.

Jim Coan (00:32:38): As far as your brain goes... And the only way that I can understand that is if I think about it in terms of humans as an animal, being in their habitat. When you're in your habitat or closer to your habitat, you have less work to do. Now, getting back to my client at the VA, what was the work that he had to do? The work that he had to do was keep that memory from coming to the fore. Not talk about that stuff. It was too dangerous. It was the decision to go after something that would've been more costly than it would've been a gain. But when his wife held his hand, she reduced the cost of expressing that pain into the world with me. And that allowed us to do the work that we needed to do for his exposure therapy.

Wendy Hasenkamp (00:33:35): I love that reframe. I think that's such an essential shift in understanding, first of all how our bodies and brains and minds and experience work—that lens of

resource allocation. But then the fact that other humans who we have relationships with are actually biological resources.

Jim Coan (00:33:58): Right. And it's at the level of the body. It's about what your body is capable of. I'll tell you another finding, a more recent finding. This comes from 2019. It was a collaboration I did with Marina Lopez-Sola and Tor Wager, where we did a version of the hand-holding study looking at the brain's response to pain stimuli. And I don't know how familiar you are with Tor's work over the last 10 years or so, but he's done this really nice work detailing what he calls the neurologic pain signature (NPS). And there's a lot of potential practical applications to this, but what he was interested in is finding a signature in brain activity that is both sensitive and specific to the subjective experience of pain. And he did it. His sensitivity and specificity are both above 95%. It's exquisite work. And in addition to this pain signature, he finds that there's this whole other extended network of affective pain processing, and that the neurologic pain signature, the NPS, sends its information to this broader network. And it's that broader network often that you actually subjectively experience.

Wendy Hasenkamp (00:35:21): I was going to say, is this pain signature about physical pain?

Jim Coan (00:35:24): It's about physical pain.

Wendy Hasenkamp (00:35:25): Okay, physical not emotional.

Jim Coan (00:35:26): It's very discreetly demarcated. So he has all kinds of nefarious pain stimuli that he uses in his studies. What he finds, in study after study, is that you can move the affective pain processing circuitry around in all kinds of ways with cognitive interventions. So CBT stuff, like do you perceive you have control over the pain? Can you explain the pain? Can you distract yourself from the pain with distracting thoughts? There's all kinds of ways.

Wendy Hasenkamp (00:36:01): Mindfulness is also very effective, yeah.

Jim Coan (00:36:02): Mindfulness, yeah. But none of those things, including mindfulness, has any effect whatsoever on the neurologic pain signature. And that was partly by design. That's what he was trying to find, if there was a sort of a hard diamond core of pure somatosensory pain processing that then becomes part of the experiential soup that collaborates with all the other stuff, right? Again, you can use mindfulness or CBT to mess with all the other stuff, but you can't use that stuff to mess with the NPS. It's going to be what it is.

(00:36:38) So just like with the first hand-holding study, we had a really, really clear hypothesis about what was going to happen with hand-holding. The handholding was going to move the affective pain processing—because it's delivering a message of resources available, and that's a cognitive message—but it was not going to touch the neurologic pain signature. And that's what everything finds.

(00:37:03) But guess what? It did. And it's the first time any kind of stimulus, it's the only time as far as I know, that any kind of stimulus that could nominally be considered psychological has been able to move the neurologic pain signature. Which of course, you can say, "Well, we found one of the psychological interventions," on the one hand, or you could say, "Hmm, there's something different about hand-holding. There's something more physiological about that, that operates at a level that's before more sophisticated processing in the brain."

Wendy Hasenkamp (00:37:39): Yeah. Is that the only intervention that's been tested in that context that involves another person?

Jim Coan (00:37:45): Yeah.

Wendy Hasenkamp (00:37:47): Interesting.

Jim Coan (00:37:48): Right. So we don't know whether someone else's presence... There was a study that I did with Greg Siegle that we sort of piggybacked onto a study of anxious children. And what we found was that when you had the mom stand in the room next to the anxious kid, then they looked like their non-anxious control peers.

Wendy Hasenkamp (00:38:09): Oh, okay. Interesting. And to what degree... I know you've investigated this too, the quality of the relationship with the person who's there holding the hand, does that mediate all these effects?

Jim Coan (00:38:22): Yeah. This is the trickiest thing, especially when it comes to understanding... This will maybe address part of what you were getting at with the question about whether any other kind of social thing has been done other than hand-holding for the pain study. Even in that study, the quality of the relationship seemed to matter. So that's fascinating because if you're thinking about relationship quality purely or entirely as a psychological phenomenon, then that makes sense, that tracks—that the quality of the relationship would have an effect on a person's ability to regulate you. But what about the NPS? It looks like probably through some kind of conditioning mechanism, the quality of your relationship changes how your skin responds to their touch, and that may have consequences for how that touch regulates.

Wendy Hasenkamp (00:39:19): That's so cool.

Jim Coan (00:39:21): And by the way, we also found that we can change that. So we can take at least married couples who do not show the regulatory hand-holding effect, and report lots of distress in their relationships, and turn them into couples that do.

Wendy Hasenkamp (00:39:36): Oh, through helping their relationship?

Jim Coan (00:39:38): Yes.

Wendy Hasenkamp (00:39:39): Oh, wonderful. And that makes experiential sense too, that how close you are with somebody is directly related to how much resources or support you can trust... There's something about trust, I guess that's in there too.

Jim Coan (00:39:54): Yep. Trust is, I think really central. Because what you're doing is making a decision to, in a sense, stop being vigilant for other demands, and just allow this other person to take on that extra work. And that's really fraught for any animal. You don't want to drop down your guard. One of the things that we like to say in my lab is, even though all throughout history for many, many thousands of years, the most reliable way for a community to kill one of its members if they were particularly bad was to cast them out. You didn't have to kill them directly, you just had to excommunicate them, and they would die. That's how you kill somebody. And so you'd think from that and from just common sense that the most dangerous thing would be to be alone if you're a human. But that's not how the brain sees it. The brain sees it in a slightly starker way, which is that the most dangerous thing really, is

to believe that you are supported when you're actually not. Because that's when you let down your guard and don't have anyone else looking out for you.

Wendy Hasenkamp (00:41:13): Right, so you're more vulnerable than even if you were alone and prepared.

Jim Coan (00:41:17): Yeah. This is why when you're alone, you do all that extra work, because you're alone. If you believed that you were not alone, but you actually were, you'd be maximally vulnerable. You wouldn't be doing the work that you needed to be doing at that time to keep yourself safe.

Wendy Hasenkamp (00:41:36): This is bringing up other questions that I often think about when I think about these theories, which relates to introversion and extroversion and that whole spectrum. Because for me, as quite a strong introvert, I feel a certain amount of resources from being alone. I feel like being around other people (I guess it also depends on the quality of the relationship), but there's an energy expenditure there. So that goes a little bit, maybe not against, but how do you think about that in the context of Social Baseline Theory writ large?

Jim Coan (00:42:14): Yeah. There's two things that all undergraduates and graduate students in my lab have to memorize. They have to devote these phrases to memory. One is that, "We must have other people to survive and have a good life." That's Thing 1. Thing 2 is, "Other people are a pain in the ass." *[laughter]* And both of those things, it's like an existential dilemma. It is absolutely both things are true. Humans have managed this evolutionary feat that I don't think any other species has managed. I wrote about this in one of the things that I published recently. On the one end of the social spectrum, you have ants and termites and bees and stuff, which are very, very hyper-social. And on the other end, you have things like wolverines and certain other kinds of marine mammals and stuff that are hyper-individualistic. They get together to mate, and then they're like, "See ya. I'm gone." And they have no interest in their conspecifics.

(00:43:19) Humans are kind of both at the same time, and that's what makes us so unique. We are hyper-social, and hyper-individualistic. We are really, really unique, each one of us. And yet we cooperate like crazy in much the same way that ants and termites do. Why is this so much of an advantage? Well, ants and termites cooperate, sure, but they have very, very limited repertoires in terms of the kinds of things they can do. The human repertoire for problem-solving is almost infinite—because you have people with non-overlapping, non-redundant competencies and perspectives and skills and histories capable of sharing a goal and moving toward the same end. Wow, that's incredible! We're like, you get a gang of humans together, and the Venn diagram is just off the charts. There's so many different circles, and that little vanishing spot where they overlap is like being a superhero. We can survive in the North Pole, or in the tropics, or in the desert, or up high on the mountain, or at sea level, wherever—underwater, on the moon. We can do it because of that ability to be flexible.

Wendy Hasenkamp (00:44:49): And the flexibility is so enhanced with different individuals.

Jim Coan (00:44:53): Right. It's our ability to bring our individual uniqueness to a shared goal that makes us absolutely unstoppable.

Wendy Hasenkamp (00:45:04): That's so heartening.

Jim Coan (00:45:06): Here's the pain in the ass part, though. This is really important because this gets back to your question about introversion and extroversion. First thing I want to say about that is that in

any group, it's a great idea to have introverts and extroverts, because that's that uniqueness toward a shared goal. But the other thing is that other people really can exert a cost. Yes, it's great that we're unique and we can take our rainbow-colored uniqueness towards solving the same goal and send ourselves to the moon. That's amazing.

[\(00:45:39\)](#) But that also means that your sweetie wants to see another dumb superhero movie when you want to see the art house film. Or they will not eat eggplant, and it's your favorite. You know, they're a pain in the ass. That's one of the costs that is brought to the human condition. And I think this is what leaves us in this kind of Nash equilibrium of society that we're in, where we are amazing and powerful, but we're also kind of a mess a lot of the time, because it's messy and hard because other people are a pain in the ass.

[\(00:46:20\)](#) I think that one of the most sublime experiences that any person, whether they're an introvert or an extrovert, can have is to be all alone when they don't have to be. If you have the option to not be alone and you've got some alone time, ahhhh, it's like, it's just like, whoa. It's the greatest thing in the world.

Wendy Hasenkamp [\(00:46:46\)](#): But if you have to be alone, then it's very stressful.

Jim Coan [\(00:46:49\)](#): But if you have to be alone, that's death. That's like death.

Wendy Hasenkamp [\(00:46:54\)](#): Yeah. That's an important nuance. It's making me think too, you've written some about the implications for loss of relationship, breakups or a death... Losing someone can feel like losing a part of yourself, and that's maybe more literal than we've thought. What are the implications for the end of a relationship, and then how we can be resilient or bounce back from that?

Jim Coan [\(00:47:25\)](#): Well, there's the macro view, which we know that people who are in relationships tend to be happier and healthier. They tend to live longer. We know that people that go through divorces, particularly hard divorces, that takes a toll that can result in fewer years on their lifespan. The other thing that we know is that when a relationship ends, people often experience subjectively a diminishment in their holistic sense of self—that they feel like their self has shrunken, or like something's missing. And this has been expressed in everything from ancient Greek tragedies to 70s-era pop songs to Taylor Swift. This is a subjective experience that's immediately recognizable, that you feel like a different person or like you're less capable somehow than you were before. And that's a normal feeling, and it often takes a while to recover from that, as anyone would know.

Wendy Hasenkamp [\(00:48:32\)](#): And so you mentioned, this is interesting about the self, because there's a lot of implications from Buddhist theory and meditation and the idea of an interdependent self or an expanded sense of self, versus this idea that we seem to run around with about our discrete, separate self. Is there more to say about that, and the way we think about ourselves in light of this theory?

Jim Coan [\(00:48:57\)](#): I think that the thing that has occurred most strongly to me about the self is that it seems very much that the self is a verb instead of a noun. And that will sound familiar to you; anyone doing contemplative scholarship will find that familiar. It's not a 'thing that you have' that you can take out and weigh, or bounce like a basketball or anything like that. You can't find a chunk of gray matter in your brain that's where your 'self' is. It just doesn't work that way. Self is an activity. And your actions are largely dependent upon your assessment of what's demanded of you, and what you're capable of, right? And we've just reviewed how your social environment is part of what your brain uses to

understand what you're capable of. And so what you're capable of is going to then be part of how you construe who you are.

Wendy Hasenkamp (00:50:01): And that's making me think too of larger societal patterns, and people with histories of trauma or who have been societally oppressed—the implications that that has on their body's perception of their resources and then how they operate in the world.

Jim Coan (00:50:20): Yeah. The central need as we see it—given all of the stuff that we've talked about, all the studies I've done, all the theory papers I've written—the central need is belonging. Because when you belong to a community... And the community can just be two. In fact, you see this fascinating finding across many different fields in behavioral ecology, looking at everything from ostriches to rats to humans pulling on a rope. The biggest difference is always between one and two. And by the time you're adding four or five to the community, the big effects are starting to asymptote pretty sharply, and then you just hit this sort of [plateau]. Otherwise, if you add like 100 critters, they'd all just be lying around, half conscious.

(00:51:15) Belonging is a way to signal that your basic human connection needs are met. And that's interesting too because belonging turns out to involve some quite complicated little dances. One thing that doesn't work and that you should not take from my research—it would be a misconstrual of my research—is that everybody just needs a hand to hold. Well, that might be true, but the misconstrual would be you need support from someone else holding your hand. Part of what you need to do is also be the supporter. That's how you create belonging. That's not my personal research, but there's a lot of research that makes that very clear. If you try to treat elderly loneliness, which is absolutely epidemic in our country, just by giving people someone to go and sit and listen to them for a while, it will not have no effect, but it's not going to have nearly the effect as if you make that person who's lonely feel socially useful. To be needed is one of the fastest and most potent ways to feel like you belong.

(00:52:32) – musical interlude –

Wendy Hasenkamp (00:53:02): I wanted to chat with you about one more really cool thing that I know you've been up to recently, which involves art. And you are a fantastic artist, and you've been working on comics recently to convey all of these ideas in wonderful ways.

Jim Coan (00:53:18): As if it wasn't bad enough. *[laughter]*

Wendy Hasenkamp (00:53:21): No, it's fantastic! I read them and I absolutely love them. And so I'm just wondering if you can share a little bit about your hopes with that, or how you approach that, and how it's been going?

Jim Coan (00:53:34): Well, it's funny. I've never been 100% comfortable in my role as a scientist, as a lab scientist. I'm not really sure why that is. But I think if I'm being completely honest, I've always felt a kind of tension around joining the rarefied world of academia as a person with a college degree, having come from a background (I'm a first-generation college student), nobody that I knew, nobody went to college. Everybody was a war veteran, but nobody went to college. And you know, I feel so unaccountably lucky all the time, getting to think about this stuff, have conversations with people like you. My god, I get paid for this! When I tell people in my hometown about these kinds of things and how I get paid to do this, they're like, "Oh, my god, you asshole! I just pulled a whole swing shift last night. And it sucked."

(00:54:40) So I've always wanted to find ways to inhabit more closely, both worlds. I know it's not entirely possible, and that's a whole other conversation, but when I was younger, before I had dreams of going to college—dreams... before I wound up with heatstroke as a roofer and was like, "To hell with this. I want to sit in a room for the rest of my life,"—I thought I was going to maybe draw comic books. I did that with my friends. I made comics when I was younger, and I did things like draw teachers' portraits for the yearbook and stuff like that. And kind of everybody thought that's what I was going to do. And it didn't take me long after graduating from high school to realize there was no money in that, so roofing was a much safer bet. Although that put you in the hospital with heatstroke, so there was no good options—except for science. *[laughter]*

(00:55:44) And in the last, I don't know, several years, I've been through a lot of changes. We all have. I've been increasingly interested in walking in both of those worlds of mine at the same time. And that caused me to start my own podcast, by the way, which I will plug here-

Wendy Hasenkamp (00:56:06): Yes! Absolutely.

Jim Coan (00:56:06): It's called *Circle of Willis*. Available wherever you get your podcasts. And trying to use that venue to invite a larger tent of people in. It's not perfect, because it's often jargony and whatever... you do your best. And somewhere along the way, I started making little funny comics of things that I think about and worry about, clinical stuff that I was... And I would post it on social media. It was not something I thought about seriously. It was like a way for me to regain my sanity during the pandemic was to start picking up my drawing again.

(00:56:53) And Paul Reyes, who's the editor and chief over at VQR, Virginia Quarterly Review, said, "Hey, I want to publish some of your science comics." And I was like, "No, you don't. You do not want... You think you want to do that, but you don't understand. I am not an illustrator. I'm a neuroscientist. I can't do this." And you know, he kind of leaned on me to do it, and I started making some versions of it. And then I started also making comics for my own classes as an alternative to reading journal articles. (Which I find almost abusive to assign anymore. They're so terrible. Sorry to all my friends who write them, I have written them too.) So I made alternative readings that are illustrated by me for my courses at UVA, and they're enormously popular. And it's not because they're easy, there's lots of tough stuff in them. But there's something that just invites good feelings when you have it with friendly illustrations and written by hand. So anyway, yeah, I've now published seven or eight of these things and am now working on a book about Social Baseline Theory that's going to be entirely illustrated in a comic format.

Wendy Hasenkamp (00:58:17): Oh great! I love it. I think it's so important to have these other avenues of communication that are, as you said, more accessible, more fun.

Jim Coan (00:58:29): More fun at the very least.

Wendy Hasenkamp (00:58:30): But still really get the ideas across.

Jim Coan (00:58:33): Well, that's like my sneaky hope, is that scientists everywhere will be forced to cite a comic book if they're going to be credible. I mean, that's a big ask of the universe, but I'm up for it.

Wendy Hasenkamp (00:58:50): I love it. So in the comic that I was able to read, which I loved, the arc is some of these ideas that we've been discussing, but then also thinking specifically about what we will be facing with climate change in the future and how these ideas apply to how we can best survive and

potentially even flourish through these times. I was wondering if you could just give a little bit of a flavor of that.

Jim Coan (00:59:18): Yeah. In the scholarship that I was doing on belonging during the pandemic, one of the things that I found is a really robust finding in many different fields (including psychology, anthropology, behavioral ecology), is that it's not just that being with your conspecifics, if you're a social species like us, helps you manage the demands of threatening times. But it's also, and perhaps because of that, that threatening and times make you seek out those relationships, those relational resources. So that makes sense, right? The shit's going down, where are my peeps that are going to help me? But the thing that I did not expect to find—and science just has these failed hypotheses all over the place—is that this often is accompanied by not just feelings that you might think are nice or calming, but people report feeling ecstatic. And I mean in the quasi-religious level of that—you know, ecstasy. That when a tragic, severe, even traumatic event has happened, and you find yourself in a community of people coming together to deal with that, and to move through it and survive it, the sense of belonging blossoms like a sudden immaculate flower garden for everybody.

(01:00:57) And contrary to essentially every disaster film ever made, people do not start trying to eat each other's babies, and stealing all their stuff, and become marauding gangs of troubled youth or whatever. When disasters happen, people very reliably and often suddenly become their very best selves. Because if there's an initial human environment to which we're adapted, it is any terrestrial environment you can imagine with other people during hard times. And there's a sense in which hard times brings us closer to our paleo diet than a paleo diet does. It activates those mechanisms that have allowed us to survive for countless millennia under the most difficult conditions imaginable. It makes us become more like ourselves.

(01:02:10) So, soon things are going to get pretty rough. Things are already starting to get pretty rough. But I don't know how much you read about the forecasts of the effects globally, and on society, but it's going to be really hard. I mean, it's going to be disaster movie hard, probably sooner than later. I am stressed about that. I think that's rational. You should be. Most people should be. But one of the things that I do hold in my back pocket is the knowledge that on average and in the aggregate, my neighbors are going to be there for me in ways that I currently can't even imagine, because I know that in example after example after example, that's always what happens.

Wendy Hasenkamp (01:03:08): And you're going to be there for them.

Jim Coan (01:03:08): I'm going to be there for them. And that's going to give me a sense of purpose that in this context of plenty, where I've done everything I can with material goods to render other people less of a pain in the ass, I don't feel that. And by the way, this creates another truism for me, which is that your ecstatic feelings of belongingness do not happen despite the fact that other people are a pain in the ass. They happen *because* other people are a pain in the ass, and you invest in them anyway.

Wendy Hasenkamp (01:03:49): Well, Jim, I really want to thank you so much, on so many levels. Your work has been incredibly influential to me, to the way I think about minds and brains and humans, and I see it also influencing the field. And also on a personal note, your podcast was actually one of the major influences that made me start to think about doing this show, so I really want to thank you for just being such an inspiration on so many levels. And thank you so much for taking the time to chat with us today. It's been great.

Jim Coan (01:04:24): Well, thank you so much for giving me the opportunity to chat with you.

Outro – Wendy Hasenkamp ([01:04:32](#)): *This episode was edited and produced by me and Phil Walker, and music on the show is from Blue Dot Sessions and Universal. Show notes and resources for this and other episodes can be found at podcast.mindandlife.org. If you enjoyed this episode, please rate and review us on Apple Podcasts, and share it with a friend. And if something in this conversation sparked insight for you, let us know. You can send an email or voice memo to podcast@mindandlife.org.*

[\(01:05:03\)](#) *Mind & Life is a production of the Mind & Life Institute. Visit us at mindandlife.org, where you can learn more about how we bridge science and contemplative wisdom to foster insight and inspire action towards flourishing. If you value these conversations, please consider supporting the show. You can make a donation at mindandlife.org, under Support. Any amount is so appreciated, and it really helps us create this show. Thank you for listening.*