

Spotlight Interview with Dr. Lani Shiota, Professor of Psychology, Arizona State University

1. How did you get involved in the field of Psychophysiology?

Studying emotion in graduate school, I noticed that that literature in that field was really fragmented and contradictory, partly because people using one method (self-reports, facial expression and other behavior coding, psychophysiology, neuroscience, social cognitive measures) were basically ignoring work done by people using other methods. It seemed like, early in training, researchers got locked into a methodological comfort zone and never even read the literature outside of it (my mentor Dacher Keltner was an exception – it was in his graduate seminar on emotion that I was exposed to all this stuff in the first place). My goal was to be able to read all this literature thoughtfully and critically, and be in a position to analyze it as a whole, using that foundation to break new ground as a researcher. This meant getting really solid training in psychophysiology. Fortunately Bob Levenson was also on the faculty at Berkeley, so transitioning into his lab for post-doctoral work was a smooth process. Bob is, of course, a superstar in terms of extremely rigorous use of ANS measures in emotion research, so it was a perfect fit.



2. Your research investigates basic questions about emotion, and you incorporate multiple methods of investigation including behavioral, cognitive, physiological, narrative, and questionnaires. How do these diverse methods work together and inform your overall research goals? In what ways do you use psychophysiological methods specifically to inform your research?

Great question! I use physio measures in three ways. First, I use it as a dependent variable in parallel with other kinds of measures (self report, behavior) in studies where emotional reactivity per se is the outcome of interest. For example, in emotion regulation research you'd typically expect to see a reduction in sympathetically-mediated physiological reactivity from baseline to trial when a participant uses some regulation strategy effectively, as compared to their reactivity when you exposed them to a similar emotional stimulus, but asked them not to try to regulate. You'd expect to see this in self-report as well, and perhaps expression, and reports of thoughts during the stimulus. To the extent that you see similar patterns across multiple DVs, it increases confidence in the effect on emotion as a whole. This is especially important because these are typically large studies with big samples, and replicating multiple studies is not always feasible for a single paper. Replicating across measures within a study is another way to demonstrate the robustness of whatever effect you're looking for.

Second, I sometimes use physio measures as an index of a psychological process of interest. This must always be done with considerable caution. I'm very wary of the problem of "reverse inference" – the assumption that if experimental manipulation of psychological process X leads to physiological response Y, then every time you see Y X must be going on (a classic logical fallacy, common in psychophysiology and neuroscience). However, if the background research for the X-Y association is extensive and carefully done, and your task rules out major alternative explanations for Y, then it's somewhat less risky. For example, we have a study right now where a few variables predict greater increases in RSA while the participant is looking at extremely unpleasant photographs (IAPS slides). Given the fairly strong literature showing that effortful control tasks produce an increase in RSA, and the fact that participants are sitting in a chair in a really unpleasant situation, the inference that the RSA is a marker for emotion regulation effort is plausible. But as I said, you've got to be really careful with these kinds of interpretations, and think actively about alternative explanations.

Third, I have some research where we look at the relationships between physiological reactivity and some other aspect of emotion, be it eliciting situation, self-report, behavior, or what have you. In this case the physiology is not just an index of emotional responding, where "emotion" is the variable, but rather the variable of interest in its own right. Our work looking at different physiological profiles of different positive emotions would go in this category, as would the comparison of physiological implications of detached and positive reappraisal.

3. What advice would you give to young researchers who are interested in learning new psychophysiological techniques?

The biggest thing is, learn in depth about the neural and physiological mechanisms of the measures you're using – knowledge shouldn't start with the signal you get from the sensors. It's become really easy to collect ANS data these days, which is great, but one implication is that a lot of people just learn to slap sensors on and then calculate heart rate with user-friendly software. I LOVE that software, it's made my life a lot easier, but it worries me when researchers collect these kinds of data without knowing (for example) how the sympathetic and parasympathetic systems interact to influence heart rate, and what kinds of changes are more likely to be due to one system versus the other, and how simple movements like tapping your feet can affect the ECG signal, and what quirks in the ECG signal mean something's wrong, and why you can't use heart rate as a global measure of sympathetic activation or even "arousal"... I could keep going, but you get the idea. And that's just for heart rate. The point is, what we all measure is an electrical or pressure-based or echo-based index of something happening inside the body. Whatever technique you use (fMRI, EEG, peripheral stuff) it's crucial to understand what actual body change is being measured by that signal, and how the body change is directed by the nervous system, in order to draw well-informed inferences from your data.

Having thrown that huge caveat out there, I'd also say that if you want to learn about a technique, just go for it! Be proactive, don't wait around for someone to offer to teach you, and don't feel like you have to stay in your comfort zone. SPR has scholarships for students who want to travel to another lab to learn a new technique, and postdocs are also a great mechanism for developing mastery of a new technique. At some point in training we may become reluctant to step outside our area of expertise, potentially looking like an idiot. Don't be afraid to fail, or screw up at first, just wade in and do it. It's the only way to learn, and it's fun! If the measure doesn't exist for something you want to capture (piloerection, anyone?), find some collaborators, mess around, and try to figure it out! Who knows – you might do some groundbreaking work that way!

4. Can you talk a little bit about your career trajectory? Specifically, you received your BA in Communication from Stanford, worked as a teaching assistant in Stanford's Program in Human Biology and a research assistant at the Stanford Center for Research in Disease Prevention, and you taught junior high school science before pursuing your PhD in Social/Personality Psychology at UC Berkeley. Why did you decide to pursue Psychology? How have your experiences shaped your career path?

I'm not really advocating my career trajectory as a model for anyone. I had no idea what I was doing in college, especially in terms of career selection and transition to grad school. "Half-assed but lucky" is the best way I can put it. My mother had not gone to college; my father and stepfather had, but were not at all involved in my education, and nobody had any idea about graduate school. So I was floundering a bit. Fortunately Stanford was an amazing, supportive place, and the good news is I had no pressure from family to go in any particular direction academically. I ended up in Stanford's communication department after first trying pre-med, loathing chemistry (and many of the other pre-meds) with a deep passion, and realizing that memorization is not my strongest skill, then briefly considering English, and then Human Biology (in interdisciplinary program drawing extensively from anthropology, psychology, and public policy as well as biology). An Introduction to Communication class just grabbed me, largely because it was my first exposure to what is essentially applied social psychology.

I loved the research I was learning about, but it also drove me a bit bananas. Stanford was the hub of social learning theory, Al Bandura's home institution, and social learning was still the dominant theory of behavior. My advisor at Stanford was an expert in health communication and intervention. In health psychology as well, the dominant models were all about knowledge, and overt beliefs, and social norms. To me, one crucial factor was glaringly absent – emotion. This wasn't an academic thing, it was just life. If you asked me "why do people do stupid stuff that clearly puts their health and well-being at risk?" I would have answered "emotion." I still would!

TAing in the human biology program after graduation was a terrific experience, building my comfort with interdisciplinary thinking and appreciation of how complex human behavior is. At SCRDP I developed my interest in health psychology further, and was planning to attend grad school in Stanford's communication program. It was the only school to which I applied, and several professors talked to me as though I were already in, so it seemed like smooth sailing. Then I got the rejection letter. I went to the program director, and essentially said "WTF?!!!" It turned out that of the three faculty I'd proposed to work with, one was retiring in a year or two, another was going on an extended leave of absence, and the third had (shockingly) just been turned down for tenure – there was no good fit for a mentor! No one had realized it until

they all sat down to look at the applications carefully. It was a mess, and I thoroughly freaked out. That was how I ended up teaching junior high science for a year – it was simply the first job I could get on short notice! Such a fabulous experience, though. I learned a ton about myself that year, and about people. Not least of which is that junior high students are really kind of awesome, if you can respect where they are in life and not assume that your sense of priorities should be theirs, and if you can listen as well as teach.

Ultimately the health communication interest drove my grad school applications: two psych departments, one communication program, and one sociology program. At that time, Berkeley was trying to get a new health psych program off the ground in collaboration with UCSF. I went to the interview weekend, and learned about what various faculty were doing, and when I heard about the emphasis on emotion I went nuts. It was AWESOME! Berkeley Psychology was becoming one of the leading centers in the world for emotion research, and it was just perfect. Fortunately they let me in!

Berkeley's plan to develop a health psych program fell through fairly quickly, but by that time I was pretty content learning about and doing basic affective science. In an interesting twist, however, my old interests are re-emerging, as health psychology as a whole is coming to recognize that power that emotional processes have over health-related behaviors.

I guess the moral of the story is, have plans, and get help from more senior people to learn how to pursue them effectively (NOT something I did well), but also keep an open mind about the direction of your work and life. If something grabs you and you can't let go, follow that lead. Oddly, many of the directions I've taken that were most fulfilling started because something pissed me off, and I wanted to fix it. I thought the TAs' approach when I took the year-long social science "side" of the Human Biology curriculum was a mess, so after graduation I became a TA myself to try to do better. (Arrogant, I know.) I pursued health psychology because I thought its failure to recognize the importance of emotion was disastrous. In emotion, I was a bit horrified that no one was talking about potentially discrete positive emotions, as though all pleasant feelings would have the same implications, so I started doing positive emotion differentiation research. Be open to being surprised, and if something bugs you, go after it! Also, setbacks are inevitable. You WILL fail at some point, and the farther you reach, the more often it will happen. When you fail, don't give up. Get more information, find out how you can improve, and try again.

5. You've been a very involved member of the Society for Psychophysiological Research for a long time. Currently, you serve as a member of the Board of Directors, chair of the Public Relations Committee, and co-chair of the Ad Hoc Committee on Diversity. What is it about SPR that has inspired you to become so involved? What would you say to early career members about the importance of professional service?

Actually, that was because of another thing that I was trying to fix. ☺ I started attending SPR as a post-doc in Bob Levenson's lab, and loved it. This is a terrific society with a ton of stored knowledge, fabulous people, and a real desire to help junior researchers grow! But frankly, within a few years it was clear to me that they had a serious diversity problem, and weren't even aware of it. I vividly remember sitting at the business lunch one year, and starting to go through the lists of officers, committee members, and career award winners that year and for previous years, realizing that the vast majority were men – in the 21st century. Ethnicity was not even on the table – with very few exceptions, everyone was white. I also remember walking into the business lunch one year and seeing tables at the front full of guys, and a whole row of highly accomplished women faculty all sitting in a row at the back of the room. This was just not ok. So I started making noise about it, requesting appointment to the diversity committee which had recently been formed, and rattling the cage. Turns out if you do that, people notice. Being in the band was a huge help here, because I had a warm relationship with several senior, highly respected members of the society, and their support and encouragement were very valuable. That commitment has grown into the others, and I'm proud to be of service to the society now.

Professional service is, simultaneously, a massive opportunity and a potential pit of destruction. On one hand, it is a great chance to learn how the field works (article and grant review, editorial work, society service roles), to increase your visibility as a scientist, and to shape the direction of your chosen field. On the other hand, if not managed carefully, it can grow into a black hole that eats all of your time, at the expense of your own research. I've not always handled it well. My advice would be to appreciate the value for service, to both yourself and the field, but also develop some strict guidelines for where it will fit into your career. What service opportunities will help you grow? Where can you really make an impact? How much time per month is realistic without eating up too much of your research time? Be a good citizen,

and make a difference, but don't get swallowed up by it. Start learning to say "no" now, and be prepared to use that word often.

This last is hard for everyone, but especially hard for many women. We are trained early how important it is to please other people, and to be liked and seen as valuable. One way I deal with that is to think through what I can and can't do for someone in a creative way, so it's not a binary yes or no all the time. If my answer isn't "yes," I often say "here's what I can't do, but here's what I can." That goes a long way to communicating respect and caring while also maintaining reasonable boundaries.

6. How have you seen diversity within SPR improved since the addition of the ad hoc committee on diversity?

I'm really happy with the changes so far, while recognizing we still have a long way to go. I think the most important thing is that the leadership now clearly recognized that we have an issue here, and is truly committed to working on it. The diversity committee, the symposium, and the reception have marvelous support from the board and officers – it's truly a team effort. It's not just hand-waving, there's real recognition that science conducted by people with diverse backgrounds and perspectives is simply better science. We're now starting to track member demographics more carefully so we can find out what the impact is over time; we weren't even collecting ethnicity data until a couple of years ago. We'll be doing a member survey in the coming months to find out what features are more important for our membership, and how we can help people develop their careers. The answers may vary along important demographic lines, and we need to know that. But in terms of member diversity, and diversity in psychophysiology as a field, we are just getting started. Students are extremely important here! You are the next generation of our society and our field. We want to know what you need from SPR to stay engaged and feel supported, especially if your background makes this particularly challenging in any way! However, in just the last couple of years diversity in the leadership had grown quite a lot as well, with a higher proportion of women and minorities on the board and in officer positions than was true even a few years ago. So, we definitely don't want to get complacent, but we're making progress!

7. What diversity initiatives are you looking forward to implementing this year?

I am thrilled to say that starting this year, we are going to have travel scholarships for the annual meeting that are specifically earmarked for individuals who increase the society's diversity – the board and the Committee to Promote Student Interests approved this at the end of 2015 (yay!). Students who apply for these scholarships will be able to make their own case for how they enhance diversity in SPR. The recipients will be recognized at the diversity reception during the conference. Stay tuned on this, applications will be available soon!

8. What do you think are the most important diversity issues facing SPR as an organization?

I think most of all we need to know what our members at all career stages need from their professional societies, where SPR's value lies, and whether this varies with diversity-related variables. We also need to understand better the barriers that people from various underrepresented backgrounds are facing, so we can develop smart ways to help people feel welcomed and succeed. We need to keep putting diverse role models up for all to see, students and faculty alike, so that we can put some cracks in the implicit association between "psychophysiology expert" and "older white male."

9. Lastly, what general career advice do you have for SPR's student members? Was there something you were told early in your career that helped you achieve the success you have had?

A lot of my advice is contained in answers above. I think other than that, I'd say you just never know what life is going to throw at you, in work or anything else, so have a direction and go after it with all your heart and smarts, but also be open to the unexpected. This is good advice for your science as well as your career. Don't be afraid to fail. And ask for help. This last is something I completely suck at, so I'm not a good role model for it, but many mistakes I've made can be traced back to not having asked for help when I should have, so it's at least well-informed advice.