

Remembering Anne Treisman (February 27, 1935–February 9, 2018)

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Lynn C. Robertson

University of California, Berkeley

APS William James Fellow Anne Treisman was not only a giant in psychological science; her work influenced a broad set of scientific fields, including vision and auditory sciences, computational science, philosophy, linguistics, neuropsychology, and cognitive neurosciences (both applied and experimental). From her student days until she retired, she was driven by questions of whether and how selective attention influenced perception in cognition and in the brain. Her hallmark theory of feature integration proposed a means by which the multitude of sensory signals received at any given moment were bound to their locations and to each other in conscious awareness. Through the use of convergent methods and impressively original thinking, she proposed that stimulus features (e.g., color, shape) were separately coded in different “feature maps” and bound in awareness through spatial attention. Although details of her theory changed a bit over time, spatial attention continued to have a central role in the perception of bound features. This was a radical idea at the time she proposed it, but hundreds, if not thousands, of studies have upheld the basic tenets.

Anne was a pioneer in the emergence of cognitive psychology, and her work was central in questioning the strictly behavioral approaches that were dominant at the time she began her studies. She argued persuasively that cognitive data were critical for understanding functional systems of the brain, without which cognitive neuroscience had no idea what it was looking for: “What is the brain trying to solve? That is the job for psychologists to work out.”



APS William James Fellow Anne Treisman was awarded the National Medal of Science by President Barack Obama in 2013.

Anne was warm and generous. She was polite and reserved, but also a force of nature. She was an incredible role model for women in science, and she lived an astonishing life. As a young girl growing up in England during World War II, she and her family moved to the country to flee bomb-battered London. From that inauspicious beginning, she grew up to attend both Cambridge and Oxford universities and to basically establish the scientific study of selective attention and its effects on perception. She received her BA in psychology from Cambridge in 1 year without any prior scientific training (her first BA was in literature) and then went on to Oxford, where she completed her PhD and was offered and accepted a research position. Her other academic appointments included faculty positions at the University of British Columbia, Canada, the University of California, Berkeley, and Princeton University, from which she retired in 2010. Along the way she was elected as a Fellow of the Royal Society and the US National Academy of Sciences and then awarded the National Medal of Science, which was placed around her neck by President Barack Obama in 2013.

What a journey!

Anne was a dear friend of mine, and she was fun. We often vacationed together, even riding the rapids on the Colorado River for 5 days with six other women. We cruised the Antarctic and the canals of France. In fact, it was on the Canal du Midi that we received a message that the National Science Foundation (NSF) was trying to contact us. We were keen to know what they wanted, since we had a proposal pending. These were the days before cell phones, but we found a landline phone on a dock in the middle of nowhere and, after pooling all of our change to return the call, were informed we had been funded. Whoops and hollers followed in a place where only the birds could hear us. (Our traveling companions had become bored and were looking for other adventures.)

The studies that were funded by the NSF award supported Anne's theory of attention and its interaction with perception. When deficiencies occurred in a patient's internal spatial map from brain injury, spatial attention could not be allocated properly. Yet features were detected no matter where they appeared (although the locations were unknown), and correctly integrating two features to perceive a conjunction was all but absent. Spatial attention does not simply move attention to desired locations but also affects the nature of the objects we perceive, store in memory, and use to understand the world we live in. The internal representation of space is fundamental.

In the following vignettes from her family and colleagues, we are given a small taste of Anne's broad influence and the love and respect that she engendered. I am so lucky to have had the pleasure of working and playing with such a brilliant woman.

Michael Gazzaniga

University of California, Santa Barbara

There was no one like Anne. I have been fortunate in my life to be surrounded by a group of scientists hopelessly committed to the study of attention. All of them, every single one, had a single idol, and that was Anne. I don't think I have ever experienced that kind of unity of opinion anywhere else.

Anne's poise and calming presence belied the mirth and wit she carried with her at all times. Sometimes it spread imperceptibly, a slight grin resolving into a twinkle in her eye. In 2012, there was a party in New York City to celebrate the 20th anniversary of cognitive neuroscience. A band was brought in from

San Francisco and enthusiasts from all over New York, Connecticut, and New Jersey showed up. Christopher Buckley, Tom Wolfe, Steven Pinker, Rebecca Goldstein, Robert Bazell, Paola Antonelli, Ben Carey, and Dan Henninger were all there to celebrate. So were the stunning couple from Princeton, Anne and Danny Kahneman. The music rocked on late and the last to leave with grins a mile wide were Anne and Danny. Together their warmth, love, and delight with life that night was evident to all. It was supposed to be a night to remember and it was. It is how I will remember Anne.

Ervin Hafter

University of California, Berkeley

A testament to the brilliance of Anne Treisman's career is clearly seen in the myriad of prizes and awards granted to her by her peers, along with her fellowships in both the Royal Society and the National Academy of Science. I will just touch on a few of the remembered moments that remind me of why I cherished her as a friend.

On first meeting, Anne seemed like one of those reserved women in classic British movies, but one soon learned that she was not afraid to stand up for what she felt was right. While at Oxford in 1973, I was able to sit in on her graduate seminar and, after a particularly stormy session, I asked about the ferocity with which students critiqued one another's work. She said it was a form of gamesmanship learned in English public schools and should not be taken too seriously; however, it worried her that Americans sometimes saw this as rudeness. Later, when I spoke to the department, I gave what was probably a pretty esoteric model of spatial hearing, and the man running the series quickly fell asleep. When his internal clock went off with 2 minutes to go, he awoke and fired off a stream of off-the-wall criticisms. Before I say could anything, Anne leapt to her feet and shouted "You have entirely missed his point" before giving him a clear version of what I had said, only better.

Anne was such a delightful person; forever full of fun. Once our Halloween picnic on the beach in California featured a touch football game. After a play in which she had been flattened, Anne bounced into the huddle laughing and sang out, "I love this, but I have no idea of what we are doing. Are there any rules in this game?"

Other favorite memories include walking into her house when she was listening to Puccini through earphones. Anne was holding the libretto and singing along with the soprano. Over one of her marvelous dinners, she avowed her love of the small Monterrey Market and fought fiercely with those touting the more chic Berkeley Bowl. Anne gravitated toward French movies, but she came alive during the English film "Hope and Glory" when the barrage balloon fell on London during the blitz. She turned to me with a smile and said, "We had a balloon like that in our garden." The woman was a oner, a kick, and a treasure to us all. Her early work on auditory filtering influenced my own work substantially, but what I will most remember is our friendship.

Shaul Hochstein

Hebrew University, Jerusalem

Anne was a colleague and friend for over 30 years. I visited her twice or three times a year, while she came to Israel many times over the years.

During a sabbatical at MIT, I began studying attention effects in primate neurons. Returning, I organized a conference on attention. Naturally, Anne was the keynote speaker. Hearing about Feature Integration Theory, for the first time directly from Anne, I asked her if the difference between single-feature and conjunction search was just due to lateral inhibition. Anne's response was only to smile her Mona Lisa smile. I understood that I'd better think it through again.

Our long collaboration was supported by grants from the US–Israel Binational Science Foundation. We analyzed attention, perceptual learning, binocular rivalry, and ultimately set summary statistics, and we discussed a broad spectrum of scientific work. One delight was our different points of view, since Anne was solidly a cognitive psychologist and I a physiologist. The meeting of these fields, reflected in our conversations, profoundly shaped my work and perhaps some of hers, too.

Anne was not just a scientist, and our connection was not just about science. Together with Danny, we went to the Joyce to see dance; we saw movies. We discussed life, family, her pride and joy in children and grandchildren, politics — American and Israeli — and science politics, too. Anne was always astute, sharp, profound, thoughtful, kind, and generous in spirit. She loved her work, her students and colleagues, and watching the field gradually accept her work as she expanded it. Anne read the scientific literature voraciously, enriching her theories with each new finding.

I was privileged to talk at the Fest in Anne's honor, where I mentioned her amazing early study of binocular rivalry. Anne found that rivalry wasn't binocular, but rather high-level interpretation rivalry — some 30 years ahead of the field! At my retirement party, Anne complimented me by devoting most of her talk to what she disagreed with in Reverse Hierarchy Theory. This was classic Anne: serious and forthright, a true friend. We miss her.

Nancy Kanwisher

Massachusetts Institute of Technology

Anne was a huge inspiration to me, and indeed to all the cognitive psychologists of my generation. She is responsible for an astonishing number of the foundational discoveries in our field. Her papers are full of daring ideas articulated in clear bold prose that sends shivers down the spine.

But at the same time, Anne was a generous, kind, and unpretentious person. To enable me to come to Berkeley as a postdoc, Anne battled extensively with the campus bureaucracy so that I could bring my own grant; she found space for me when her own lab was tiny; and she did all of this before we had even met — despite the fact that I had yet to publish a paper.

Anne had a wry sense of humor that was all the more delightful coming from this otherwise reserved and gracious giant of the field. I remember us “kids” in the lab worrying about the latest attack on feature-integration theory, and Anne just responding with a mischievous grin and a sparkle in her eye, saying: “Here we go again!”

I remember a star-struck graduate student approaching her at a conference and telling her about their obscure psychophysical finding, and Anne saying: “What would you like, my blessing?” I remember her reporting that when she first moved to California, one of the very Californian psychologists at Stanford asked her, “What do you do for your body?” She replied, “I feed it!”

Our field has lost an intellectual beacon and a lovely human being.

Nilli Lavie

University College London

Anne's legacy as one of the giants that shaped the field of attention research as we know it today is beyond what can be captured in a few words. Here I will just share a few personal memories of Anne as my mentor, role model, and very dear friend.

As a student of attention at Tel Aviv University, I admired Anne's work and felt extremely fortunate when I succeeded in securing a postdoc fellowship from the Miller Institute to be hosted in Anne's lab at the University of California, Berkeley.

My postdoc with Anne was a formative experience, and much of my research style has been inspired by her ways. In our regular meetings, I deeply enjoyed her razor-sharp mind and her rigorous, hard-nosed, empiricist approach. The most frequent sight I would encounter upon arriving to our meeting was Anne sitting on the baby-blue sofa in her lab, going over long data files from her students. As a true empiricist, Anne always examined the data very carefully and would make sure not only that the overall data were accounted for, but also that the pattern held when individual subjects were examined. She remained skeptical of her own ideas until they were fully supported by a large amount of data. It was continually impressive to see how humble she remained despite her legendary name.

The importance of having robust data as a strong foundation for any theoretical argument struck a strong chord in me, and I ended up replicating some of my PhD experiments in her lab to ensure that my load theory was replicable before I submitted it for publication. I can still hear Anne saying to me: "You don't just want to publish your load theory: You want to convince the world [with very strong empirical grounds for the theory]." This was long before the "replication crisis" in psychological science, and I believe that if more people had had Anne's attitude this crisis wouldn't have arisen.

While I deeply cherished having Anne as a role model for my scientific approach, I was also struck by Anne's exceptional generosity from the first day of my fellowship. I had originally requested to be able to work in a nonshared office; however, upon my arrival at Berkeley, the only space available was a desk at Anne's lab. Anne offered that I work from her own departmental office, and we both agreed this was a great solution since I could set up a dedicated subject-testing desk right next to me within the office. She did not care in the slightest about not being able to use the grander departmental office; with her modest and down-to-earth character she was, if anything, rather pleased about the efficiency gained by my collecting data in her departmental office instead of drawing on the lab's shared testing cubicles.

Anne's generosity and kindness continued throughout my postdoctoral period. Although we never actually collaborated, she was highly supportive of my endeavours. We regularly met for mentoring sessions and discussed my work. Anne carefully read the draft paper from my PhD work and even corrected my English, which was no minor ask: Back then, my English was in fact "Hebrish" (an often entertaining hybrid of Hebrew and English). I am still in deep awe of this level of generosity!

I feel fortunate to also have had precious time with Anne as a very dear friend. Already early in my postdoc days in Berkeley we formed a tradition of going out for dinners together, during which I

relished her gentle and self-humouring nature. Our conversations spanned from discussing highly intellectual matters to musing over whether the neck is a body part or part of the face (which of course has important consequences for choosing the right moisturizing cream!). We continued this tradition across many years during her visits to the United Kingdom, and in the last few years it was remarkable to also see her strength of spirit, conquering any physical discomfort and keeping her good humour still.

She was a beautiful and admirable person — one of a kind! (I think Anne would have advised me not to put that exclamation mark there.) She is unforgettable and her voice will always stay alive with me and, more importantly, for the field of attention as a whole.

Barbara Mellers

University of Pennsylvania

I first met Anne when she became my colleague at the University of California, Berkeley, in 1987. She had a unique personal presence in the department. She was brilliant and funny, but also shy and self-effacing. Her intellectual presence was enormous. Objects in the world, such as cars, trees, houses, and streets, are first perceived as a set of distinct features, such as shape, size, and color. Anne theorized that attention was the glue that held them together. For years, she and her students tested implications of the theory. Her insights stood the test of time: Later studies in neuroscience further supported her feature-integration theory.

For more than 30 years, Phil Tetlock and I spent evenings with Anne and Danny enjoying dinners and conversations. After they moved to Princeton, we would see them in the summers in Berkeley, where we would magically pick up where we had left off. When we moved east, we would get together again in New York and continue those delightful old habits.

I often marveled at what Anne had done — transformed herself from a modern and medieval language major into a world-class psychological scientist who had profoundly shaped the fields of attention, perception, hearing, and memory. And she did all of that while raising four amazing children. Sometimes I would ask her, “How did you do it all?” and she would reply, “Badly.” Years later I asked her daughter, Deborah — who has a spectacular career and two amazing children — “How do you do it all?”

“Badly,” she said, reminding me of her mother’s charming and self-effacing ways.

Debora Treisman

The New Yorker

Daniel Treisman

University of California, Los Angeles

Jessica Treisman

New York University

Stephen Treisman

United Kingdom

As a child, one implicitly accepts one’s own family as normal, so it took some time for us to recognize

that our mother was actually extraordinary. Nowadays, few women in academia would attempt to have four children, and doing so would be likely to derail their careers. In our mother's case, her success never seemed to come at the expense of her family — and it never seemed to occur to her that it might. She had planned to have four children, and even having a handicapped child in third place didn't dissuade her from sticking to the plan. She threw herself into the job of raising us. She kept extensive notes recording our conversations and following our language development. She spent hours combing through recipe books and shopping for groceries, so that she could serve us interesting meals. Every Sunday, she cooked a roast for a traditional Sunday lunch and often several desserts. And with all this, as our grandmother used to say with wonder, she still had time to play the piano.

Although we were born between 1963 and 1970, at a time when she was often the only woman in her professional sphere, it never occurred to us that it was unusual for a woman and a mother to have a fulfilling intellectual academic career, to pursue her interests and desires. It was always made clear to us that our goal in life was to discover our own fascinations and ambitions, and then pursue them uninhibitedly and fearlessly, that having a profession that was also a true vocation was the only way to go. She supported not by intruding or offering forceful advice, but by listening, being available in whatever way she could, admiring and supporting our accomplishments, however small, and also knowing when to step back and say nothing. It is an incredible luxury, a foundation for everything, really, to go through life feeling that there is always someone who is proud of you.

Her work was part of our lives from an early age. The speed with which we sorted cards confirmed her first ideas about how features and objects are perceived. On school holidays, we spent time perched on the high windowsills of her office in the Psychology/Zoology building in Oxford, wandering the halls admiring the turtles, or using the coffee area for long games of Monopoly. Later, with colored pens and stencils we produced cards for her experiments, or worked as official subjects for a fee comparable to our income from babysitting. In Vancouver, she spent every evening sitting at her end of the couch in what we called "the quiet room," pen in hand, a stack of papers in her lap, her calculator on the arm of the couch. She always enjoyed having colleagues, students, and friends over for meals and parties. For someone who was fundamentally private and a little shy, she entertained with enthusiasm. We went to hear her give public talks, and vicariously enjoyed her many awards, which culminated in a trip to the White House to watch her receive the National Medal of Science from President Obama. Despite all the recognition, she was never particularly convinced that she had done anything unusual. She preferred to hear praise of her children.

Only after we had tried to establish our own careers and families did it become clear how effortless she had made it seem to do things that were actually often difficult. Not only did she raise us and pursue a groundbreaking career, she changed course mid-life, moving countries twice, reestablishing herself and her identity, away from her own mother, her nationality, and her safety nets. She taught us that change is not only possible, but can enrich as much as it challenges. She taught us not to fear it, but to welcome it.