

Testimony before the Subcommittee on Research and Science Education

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#### Abstract

People differ markedly in their emotional expertise. Many people, but not all, feel the heat of anger, the despair of sadness, the dread of fear. Some instead experience amorphous feelings that are either pleasant or unpleasant. This basic research finding has been translated into emotional literacy training programs with proven health, economic, and educational benefits. It also illustrates how basic research in the social and behavioral sciences allows people to live healthier and more productive lives.

Thank you for the opportunity to speak with you today. I run an interdisciplinary lab where we study the very basic nature of emotion, from both the standpoint of the psychologist (who measures behavior) and the neuroscientist (who measures the brain). Today, I'll wear my psychologist's hat and tell you the story of a single scientific discovery that is already improving the lives of Americans. It is also a promising lead to solving some of the country's most pressing public health issues, and illustrates the value of basic research in making a healthier and more productive nation.

Seven years ago, when the twin towers collapsed, people had many reactions. Here are just two. One person said "The first reaction was terrible sadness and tears..... But the second reaction is anger, because you can't do anything with the sadness." Another said "I felt a bunch of things I couldn't put my finger on. Maybe anger, confusion, fear. I just felt bad on September 11<sup>th</sup>. Really bad." These examples demonstrate a phenomenon about emotion that I discovered fifteen years ago.

When I was in graduate school, I noticed something curious in my psychotherapy patients. Some people used emotion words to refer to very precise and distinct experiences -- they felt the heat of anger, the despair of sadness, the dread of fear. Others used the words "anger," "sadness," and "fear" interchangeably, as if they did not experience these states as different from one another. They felt, for lack of a better word, "bad." Outside the therapy room, I saw the same thing in friends and family and students. This observation was the basis for a decade-long research project (supported by both NSF and NIH) where my lab tracked the emotional experience of over 700 people during the course of everyday life using a then-novel scientific procedure called computerized experience-sampling ([www.experience-sampling.org](http://www.experience-sampling.org)). Using novel software and

statistical procedures, we made an important discovery: people differ in their emotional expertise. Some people, as in the first example, are emotion experts and experience a wide variety of nuanced emotions, in much the same way that a wine expert can distinguish the type of wine as well as its vineyard and vintage. Other people, like the second example, experience emotion as an amorphous feeling that is either pleasant or unpleasant, just like wine novices who can't tell much more than whether a wine is red or white. Over a ten-year period, my lab discovered that differences in emotional expertise translate to important outcomes. Emotion connoisseurs are more flexible in regulating their emotions. They are more centered, and less buffeted by slings and arrows of life. Those with less emotional expertise, by contrast, live life as turbulent rollercoaster with more ups and downs.

These basic research findings are now being translated into emotional literacy training programs for children (ages 4 to 14), teachers, and school administrators (see [www.ei-schools.org](http://www.ei-schools.org)). By the end of next year, 250 schools in the New York school system alone will participate, and already the results are promising. Children who can identify, understand, label, and regulate their emotions effectively have fewer clinical symptoms, and are at lower risk for violent behavior and drug and alcohol abuse. They have better social skills, and stronger leadership skills. Perhaps most surprisingly, hundreds of studies show that emotionally intelligent children have higher grades in math, science, and reading, meaning that emotional literacy must be included in educational reforms like No Child Left Behind. These are welcome outcomes, especially given the recent UNICEF report showing that US children have the second-lowest rate of well-being across 21 developed nations.

But emotional expertise isn't just about happiness – it translates into economic stability and productivity for our country. The emotionally intelligent children of today become the skilled and productive adults of tomorrow. In a recent forum on children's education, the noted economist and Nobel Laureate James Heckman argued that social and emotional expertise is necessary to improve the quality of the American workforce. A happier and socially skilled workforce translates into an increase in the Gross Domestic Product.

Emotional expertise will even play a role in addressing some of the nation's most pressing problems. For example, emotional literacy may help to prevent early retirement in adults, which costs the government significantly in social security and health care benefits. Anecdotal evidence shows that, regardless of their plans, people often decide to retire on the spur of the moment, say, after a particularly bad day in the office. So instead of retiring at age 67 (when they should), or age 65 (when they plan to), they retire, on average, at age 63. By teaching emotional literacy to adults, we can prevent that bad day from causing them to retire early, allowing people more financial security and saving the government a lot of money in the process.

From a purely scientific standpoint, the discovery that not everyone feels anger or sadness or fear has helped to ignite a paradigm shift in the study of emotion. Emotions used to be thought of as simple reflexes or light switches that turn on parts of your brain, and that could be turned off by a drug or changing the right gene. But we now know that's not the case, which is why there's no pill that cures depression, and no single gene that controls happiness. The exact nature of emotion is now the topic of heated debate and furious research, and the history of science teaches us that key scientific discoveries

are made during such times. At the frontiers of science, nothing speeds scientific progress like the clash of competing viewpoints. This may not be comfortable, or cheap, but it is absolutely necessary.

Science is like a food chain, with basic research at the base, feeding translational research, which feeds applied research, which can be used by service providers. Without a healthy base, however, the entire ecosystem becomes weak and cannot survive. Basic research in social and behavioral sciences is being starved in America. And without this basic research today, there will be no critical health solutions for tomorrow.

It takes time for basic science to feed applied solutions. In genetics or pharmacology, the lifecycle of discovery is usually several decades. Scientific discovery is like slowly peeling an onion – while exploring one question, other, more nuanced questions are revealed beneath (and sometimes, a lot of tears are shed along the way). But here in the social & behavioral sciences, a basic finding about emotion was translated after only 15 years -- a relatively quick outcome for science, but one that serves both public health and the public treasury.

Science is about exploration, risk, and discovery. This means that you cannot run scientific discovery like a business, where you set a tangible goal and try to meet it on a strict timeline. A seemingly trivial, everyday occurrence or a very abstract idea can, upon closer inspection, open up a new scientific vista. The neuroscientist who discovered that canary brains grow new cells after birth wasn't *trying* to solve the puzzle of human mental illness. The physicists who discovered quantum mechanics were not *trying* to build a better computer. Social scientists who studied the evils of conformity after World War II weren't *trying* to keep people from using drugs. And my own research on emotion

wasn't *originally* targeted at helping children and retirees, but in the end, this is where it has led. Regardless of the goals that motivate basic research in the first place, it is simply a fact such research is necessary to achieve the critical, and often surprising, results that help people live healthier and more productive lives.

Congressman Baird, you and your colleague Congressman Kennedy deserve a lot of credit for encouraging NIH to provide a better infrastructure to support basic research in the social and behavioral sciences. I know I speak for my colleagues when I say that we are all very grateful for your efforts. I myself am fortunate that my laboratory is well supported by federal funding agencies at the moment. In the context of today's hearing, however, this funding success is a bit misleading, because the majority of it pays for the neuroimaging side of my research on emotion. Like many labs around the country, my lab is also struggling to move our social and behavioral research forward. For the social and behavioral sciences to realize their full potential in the service of this country's health and well-being, labs like my own need four things to succeed: a well-trained scientific workforce of sufficient expertise and diversity, more advanced technology that is suited to the scientific questions we want to ask (whether or not they have an applied value that is immediately obvious), an adequate level of research funds to see our best ideas (and perhaps riskiest) forward, and open minds that are not mired in the habits or agendas of the past.

## Biography of

Lisa Feldman Barrett, Ph.D.

Lisa Feldman Barrett, PhD, is currently Professor of Psychology and Director of the Interdisciplinary Affective Science Laboratory at Boston College, with appointments at Harvard Medical School and Massachusetts General Hospital. Dr. Barrett received her Ph.D. in clinical psychology in 1992, and has since received additional training in social and personality psychology, psychophysiology, cognitive science, neuroanatomy, and cognitive neuroscience. Her research focuses on very basic question of what emotions are, both from both the standpoint of the psychologist (who measures behavior) and the neuroscientist (who measures the brain). Her work also incorporates insights from philosophy, anthropology, and linguistics.

Dr. Barrett is an elected Fellow of the Association for Psychological Science, the American Psychological Association, and the Society for Personality and Social Psychology. In 2007, she received an NIH Director's Pioneer Award for innovative research on emotion. She is also the recipient of an Independent Scientist Research Award from the National Institute of Mental Health, a Career Trajectory Award in Experimental Social Psychology, the James McKeen Cattell Award, and an American Philosophical Society Fellowship. . Dr. Barrett has served as an elected member to the governing boards of the International Society of Research on Emotion and the Society for Experimental Social Psychology. For the past eight years, she has continually served on grant review panels for either the National Science Foundation or the National Institutes of Health. She is a founding Editor-in-Chief of the journal *Emotion Review*, and sits on the editorial boards of top tier journals in both psychology and neuroscience.

Dr. Barrett's lab has been continually funded by the National Science Foundation since 1998. In addition to NSF funding, her lab currently receives support from the NIH Director's Pioneer Award program in the National Institute of General Medicine, the National Institute on Aging, and the Army Research Institute.

Dr. Barrett has published over 90 papers and chapters, including a National Research Council white paper on the nature of emotion. She has edited three books on the science of emotion, including the current edition of the *Handbook of Emotion*. She also wrote the current entry on emotion for World Book Encyclopedia.