

Foreword: A dedication to Nalini Ambady

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The editors of this book have generously decided to dedicate it to the memory of Nalini Ambady who died from acute myelogenous leukemia on October 28, 2013. One of the pioneers of the field that has come to be known as cultural neuroscience, Nalini was originally commissioned to script the foreword for this edited volume. She was a prolific researcher whose work spanned cultural psychology, nonverbal behavior, stereotyping and discrimination, and cognitive neuroscience. She was renowned for her creativity as an experimentalist, for her habit of publishing groundbreaking work, and for her warmth, kindness, and grace as an individual. Yet her path was circuitous, unconventional, and characterized by the same intuitive reasoning that her research program would eventually describe as one of the best methods by which people gain insight about the world.

Nalini was born on March 20, 1959 in Kerala, India. She spent much of her early life moving around India as her family followed her father's various assignments and postings as a member of India's military forces. After attending the Lawrence, Lovedale boarding school as a teenager, where she served as Head Girl, she was a student at Lady Shri Ram College for Women, part of the University of Delhi, where she received a Bachelor's degree. A twist of fate then brought her to psychology. Having completed her undergraduate education, Nalini's parents were eager to arrange a marriage for her. Feeling the impending pressure that an arrangement would be reached, Nalini decided that her best strategy to delay would be to continue her studies. She therefore decided to apply to available graduate programs in psychology, a topic that had always interested her, and thought it best to go abroad to spurn her parents' efforts at her marriage. Well past the usual North American deadlines for graduate programs, Nalini found one appealing program whose application deadline had not passed: the terminal Master's

program at the College of William and Mary in Williamsburg, Virginia. Nalini's hand-written application was successful and her maneuver to delay her arranged marriage would come to change her life in ways she did not expect.

Although she received generous aid and scholarships from William and Mary to attend the graduate program, the trip from India was well beyond her family's means. Her father therefore sold his Vespa motorcycle to cover the cost of her plane fare to Virginia. Nalini reported not the smoothest transition to life in the West. Although she rarely wore a sari, she happened to choose one when dressing the day she left India. She was greeted by a high-ranking administrator from the college at the airport when she arrived and later reflected on how exotic she must have seemed to him in the context of quaint Williamsburg, Virginia. Later, at a dinner of the students and faculty, Nalini was shocked to find that the party's guests had neglected the head of the whole-cooked fish presented on the buffet. A delicacy in her experience, she quickly snatched it up. Returning to the party, she was met with confusion and some horror from her North American hosts, for whom the fish's head is most typically discarded. Nalini's greatest challenge in her early years as a graduate student, however, was her unfamiliarity with the emerging technology of computers. Nalini had never learned to type and managed to survive for the first few years of graduate school drafting all of her papers and manuscripts in what she recounted as a beautiful and painfully-trained penmanship. Eventually, her advisors made it clear to her that she would need to learn typing, as she would not be able to continue submitting hand-written manuscripts to academic journals. Even until her death, though, typing was not a skill to which Nalini took well. This led her to greatly prefer phone conversations over email exchanges, a curiosity in her behavior that most of her students and colleagues

noticed but for which most never knew the cause. Her modal reply to an email of any length consisted of two words: “call me.”

Studying psychology at William and Mary sparked an interest in Nalini that had previously not been kindled. She therefore decided to continue her education in psychology by pursuing a Ph.D. By this time, her parents were not as dogged in arranging a marriage for her back in India but it did not hurt to protect her cause by staying in North America. She, hence, ventured north to Harvard University. Her graduate days at Harvard were challenging for Nalini. Met with some bad luck in the lab and difficulties with her initial supervisor, Nalini eventually was taken under the wing of Bob Rosenthal—famous for his work on self-fulfilling prophecies, statistical methodology, and the study of accuracy from nonverbal cues. One of Bob’s best-known studies was on what became dubbed the Pygmalion Effect. In short summary, he found that teachers led to believe that some of their students would “bloom” over the course of the school year actually achieved greater success, presumably because the teachers began to behave differently towards those students in a way that encouraged their development and success. Nalini followed on this theme of Bob’s earlier work on teacher-student interactions in her dissertation work. Nalini went to classrooms video-recording instructors while they were teaching. Her goal was to obtain clips of the teachers that she could then use to code aspects of their nonverbal behavior to see whether their success (measured in the form of the students’ evaluations) could be gleaned from their nonverbal expressions.

For her study, Nalini needed segments of video in which the instructors were alone. That is, they could not be obstructed by interactions with students. Nalini was crestfallen to discover that in the hours of videotape, none of the clips of teachers alone

exceeded more than two minutes. Such clips were far too short to code the nonverbal cues that she intended. Although she saw her dissertation as another failed attempt, Bob encouraged her to press on with the shorter clips. This single serendipitous event may have changed Nalini's life more than any other. Forced to use the briefer clips, Nalini stumbled upon the phenomenon that would become the signature of her career: the concept of thin slices of behavior. Extracting 10-seconds from the first, middle, and last 10 minutes of each teacher's instruction, Nalini was able to find that judgments of the teachers from these extremely brief, disjointed segments allowed for accurate prediction of their students' evaluations. A second study showed that these judgments predicted principal's evaluations of teachers' effectiveness as well. Nalini had happened upon an effect of social perception that others and she herself would have previously considered unthinkable. She pushed this even further by reducing the clips to as brief as 2-second segments cropped from the original 10-second clips. There, she found that even just those 2 seconds of viewing time allowed for judgments of the teachers that significantly corresponded with measures of their success (Ambady & Rosenthal, 1993).

Nalini had struck scientific gold. Her discouragement about research throughout graduate school finally gave way and was now made enthusiastic by the taste of some success. Not only had she uncovered the interesting phenomenon that teachers' success can be judged from such minimal information, she had developed a new methodology for research in person perception that would transform the field even more than it had her personal outlook. This work earned her a dissertation award from Division 5 of the American Psychological Association (Evaluation, Measurement, and Statistics) as well as

the Behavioral Science Research Prize, shared with Bob, from the American Association for the Advancement of Science.

Her spirits buoyed, Nalini stayed on at Harvard after receiving her Ph.D. in 1991 to finish up her work on thin slices as a post-doctoral fellow with Bob until 1993. She then took her first faculty position at the College of the Holy Cross not far away in Worcester, Massachusetts. She was only at Holy Cross for a year before returning to Harvard as an assistant professor in 1994, where she spent roughly the next decade of her career. Although graduate school had presented challenges for Nalini, life as junior faculty at Harvard lived up to its reputation as arduous. Much to her parents' delight, Nalini had met and married a talented Indian law student while a graduate student. She and her husband soon had two daughters who, as infants, were in regular attendance at Nalini's lab meetings and were often found sleeping in her office while she worked.

Despite the pressures that came with being junior faculty and a new mother, Nalini often reflected on those early years as some of the very best of her life. In particular, she found the camaraderie and support of her colleagues to be a rich soil in which grew close lifelong friendships. Not only did Nalini find a niche in her personal life during those first few years on the faculty, but professionally she was blossoming as well. In 1998, she received two major awards: an Early Career Development (CAREER) award from the National Science Foundation and was the first psychologist to receive the Presidential Early Career Award for Scientists and Engineers (PECASE), awarded by U.S. President Bill Clinton. Following in the steps of her mentor, Nalini taught graduate statistics to students who today constitute some of the best and brightest scholars in the field. Nalini was an excellent teacher and received a teaching award from Harvard for her

skill in the classroom. In terms of research, Nalini continued her work investigating thin slices but broadened her scope into new areas as well.

Nalini published her first paper on cross-cultural differences in 1996 (Ambady, Koo, Lee, & Rosenthal, 1996). This began a theme of research into cross-cultural differences in social cognition and social behavior that would become a hallmark of Nalini's career, with additional papers in this area due to be published even now after her death. It was this line of work that metamorphosed into her work on cultural neuroscience in later years. In the early time of her research career, however, Nalini also laid the ground for a wide array of effects that would come to distinguish her research in terms of creativity, impact, and breadth.

Some of Nalini's most notable work was on the effects of stereotypes on individuals' academic performance. Following the stereotype threat literature pioneered by Claude Steele and Joshua Aronson (Steele & Aronson, 1995), Nalini and her students showed that activating stereotypes about one's ethnic group or sex could boost performance as well as hinder it (Shih, Ambady Richeson, Ambady, Fujita, & Gray, 2002; Shih, Pittinsky, & Ambady, 2001). This was a transformative finding that shifted the way researchers thought about the effects of stereotyping on performance and changed the subsequent research in the field on this topic.

Another incredibly influential vein in Nalini's research program was that on emotion recognition, particularly with regard to cross-cultural variation. Early work had shown that emotions were expressed and perceived relatively universally across cultures (Ekman & Friesen, 1971). In a landmark meta-analysis of almost 100 studies, Nalini found that there were, in fact, cultural differences in the magnitude of emotion

recognition for ingroup and outgroup members, even if the overall outcome tended to be one that was accurate irrespective of who was expressing or perceiving (Elfenbein & Ambady, 2002a; 2002b). She went on to find that cultural familiarity seemed to be the mechanism driving this (Elfenbein & Ambady, 2003a; 2003b) and this line of work paved the way to another on what Nalini and her students referred to as “nonverbal accents” in the expression and judgment of emotional expressions (Marsh, Elfenbein, & Ambady, 2003) and other nonverbal behaviors (Marsh, Elfenbein, & Ambady, 2007). This work showed that very slight differences in the way that people express themselves give signs of their cultural background; for instance, how expressions of a broadly-understood and universal emotion such as anger distinguishes Japanese nationals from Japanese-Americans, or how differences in the way that Australians and Americans wave “hello” give away their nationality.

One of Nalini’s best-known research areas was the study of how subtle nonverbal cues can allow for accurate judgments of sexual orientation. Beginning with a paper published in 1999, Nalini and her colleagues showed that thin slice clips as brief as one second in length (as well as still images taken from these clips) allowed perceivers to accurately judge men’s and women’s self-reported sexual orientation (Ambady, Hallahan, & Conner, 1999). This work continued later with a series of papers in which Nalini and her students explored the details and nuances of these effects (e.g., Rule, Ambady, Adams, & Macrae, 2008; Freeman, Johnson, Ambady, & Rule, 2010; Rule, Rosen, Slepian, & Ambady, 2011). One of these studies specifically examined the influence that targets’ and perceivers’ culture exerts on the accurate judgment of sexual orientation, finding that men’s sexual orientation could be judged accurately from their

faces largely independent of the culture of the person judging or being judged (Rule, Ishii, Ambady, Rosen, & Hallett, 2011).

Nalini began her foray into cognitive neuroscience research in 2003 as a collaborator on a project with her then post-doc, Reg Adams—one of the chapter authors in this book, on differences in amygdala response among individuals perceiving either direct or averted eye gaze in photos of others (Adams, Gordon, Baird, Ambady, & Kleck, 2003). From there, Nalini began applying cognitive neuroscience tools to her work on emotion recognition (Elfenbein, Mandal, Ambady, Harizuka, & Kumar, 2004; Mandal & Ambady, 2004) and stereotyping (Chiu, Ambady, & Deldin, 2004), which paved the way for a large research program aimed at understanding intergroup and cultural differences in the neural correlates of social perception.

It was around this time that Nalini left Harvard to continue her career at nearby Tufts University, just a few miles down the street. In 1999, Nalini had been promoted to associate professor at Harvard with an endowed chair named for John and Ruth Hazel. According to reports in Harvard's student newspaper, *The Harvard Crimson*, both the psychology department and dean of the faculty approved Nalini's tenured promotion to full professor in 2002 but was ultimately denied in a decision made by then president Larry Summers (Vascellaro, 2002; 2003). Despite indications that Summers's decision might have been informed by a small minority of faculty members acting independently of the department to influence Summers, Nalini remained positive towards her colleagues and the support that she received from the majority of them before and after her departure from Harvard.

Disappointing as Summers's decision might have been, Nalini's departure from Harvard was bittersweet, as her move to Tufts would mark the beginning of a renaissance in her research program. Now a full professor with an endowed chair (Neubauer Faculty Fellow) and flush with grant support, Nalini's lab grew large—at one point numbering four post-doctoral fellows, six Ph.D. students, and over 30 undergraduate research assistants. The influx of new trainees added new directions to her research, inspired by her students' individual interests. She began a profusion of work on multiculturalism, specifically focused on implications for race, ethnicity, and the experience of people with multiracial backgrounds (e.g., Chiao, Heck, Nakayma, & Ambady, 2006; Pauker et al., 2009; Rattan & Ambady, 2013). In a related area of research, Nalini and her students began investigating the way that people's nonverbal responses to others shaped the impressions of third-party observers in a way that builds and maintains cultures of prejudice and discrimination (Weisbuch & Ambady, 2009; Weisbuch, Pauker, & Ambady, 2009). Meanwhile, three entirely new research tracks opened up in Nalini's lab: one on the effects of physical embodiment of psychological concepts on social perception (e.g., Slepian, Weisbuch, Rule, & Ambady, 2011), another on the dynamic and interactive nature of perception based on fluid and continuous theoretical models of cognition (see Freeman & Ambady, 2011 for review), and one on cues to personality and behavior present in social media (e.g., Ivcevic & Ambady, 2013).

Despite the growth into these new areas, however, Nalini still maintained active lines of inquiry on her longstanding topics of interest. She continued to publish novel and exciting work on emotion recognition (e.g., Weisbuch & Ambady, 2008) and extended this into new areas, such as considerations of how aging affects judgments of emotion

(Krendl & Ambady, 2010). Of course, she continued to publish high-profile work on the accuracy of judgments based on thin slices of behavior, continuing within the theme of predicting success that she had begun with her initial dissertation work (e.g., Ambady, Krabbenhoft, & Hogan, 2006; Rule & Ambady, 2008), that included a book on the general topic entitled *First Impressions* (Ambady, & Skowronski, 2008). She also continued to examine cultural differences in thought and behavior as they intersected with these new domains of research (e.g., Freeman, Ma, Han, & Ambady, 2013; Rule, Ambady, et al., 2010). Where her work really accelerated, however, was in social-cognitive neuroscience—particularly the application of cognitive neuroscience methods to answering questions about cultural differences in brain function and behavior.

Nalini's social neuroscience work followed several of the lines already laid out by her previous behavioral work. She published a flurry of studies examining the brain's role in thin slice judgments (e.g., Cloutier, Ambady, Meagher, & Gabrieli, 2012; Freeman, Schiller, Rule, & Ambady, 2010; Rule et al., 2011), the neural correlates of prejudice and stigma (e.g., Krendl, Kensinger, & Ambady, 2012; Krendl, Moran, & Ambady, 2013), and a host of studies following up on her initial work on the role of the amygdala and other subcortical structures in processing social cues from eye gaze (Adams et al., 2011; 2012).

The last of these served as a bridge into her work in cultural neuroscience. Her first cross-cultural neuroimaging study examined amygdala responses during perceptions of fear in the faces of cultural ingroup and outgroup members (Chiao, Iidaka, et al., 2008). She then extended this work to specifically considering the role that eye gaze plays in attenuating these cultural differences in amygdala response (Adams, Franklin, et

al., 2010). Related to this, she and her students conducted an innovative and relatively groundbreaking study examining cross-cultural differences in superior temporal sulcus activity during mental state inferences from the eyes of cultural ingroup and outgroup members (Adams, Rule, et al., 2010). Not the least of this effort was the requirement to develop a version of the Reading the Mind in the Eyes Test (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) using East Asian stimuli that has since become widely used.

True to her start once more, Nalini and her lab also investigated cross-cultural differences in the neural substrates of thin slice judgments. In one study, she and her students explored cultural differences in amygdala responses to judgments predicting the electoral success of Japanese and American legislative political candidates (Rule, Freeman, et al., 2010). Another line of research exploring the brain basis of inferences of judgments of dominance and submission (see also Chiao, Adams, et al., 2008), found that American and Japanese university students showed distinct responses when perceiving nonverbal displays of dominance and submission in reward-related areas of the brain (e.g., the caudate nucleus). This difference in response to dominant versus submissive bodily postures tracked with differences in cultural values between the US and Japan in terms of adherence to individualist (dominant) and collectivist (submissive) behavior, as well as with individual differences in the endorsement of dominant versus submissive behavior and values (Freeman, Rule, Adams, & Ambady, 2009).

Perhaps even more influential than her original empirical work in the area of cultural neuroscience, Nalini also published a series of important review articles that tied together the findings of the multitude of researchers working in this emerging field. These chapters and review articles helped to introduce cultural neuroscience to

researchers in both of its parent disciplines of cultural psychology (e.g., Ambady, 2011; Chiao & Ambady, 2007) and neuroscience (e.g., Freeman, Rule, & Ambady, 2009; Rule, Freeman, & Ambady, 2013), as well as for general audiences in psychology (Ambady & Bharucha, 2009).

After spending a year's sabbatical as a fellow at the Center for Advanced Study in the Behavioral Sciences at Stanford University from 2009-2010, Nalini permanently relocated from Tufts to the psychology department at Stanford University in the summer of 2011. Unfortunately, her time at Stanford would be short-lived. In November 2012, Nalini received the news that the leukemia she had initially and miraculously survived in 2004 (diagnosed just as she was arriving at Tufts) had returned. Faced with the need for a bone marrow transplant, a tide of outpouring from Nalini's former students, colleagues, and strangers in the field who were merely admirers of her work, pooled together to launch an international campaign to find a donor and raise awareness of the need for South Asians in the international bone marrow registries. Despite their valiant and tireless efforts, a suitable donor was never found. Throughout rounds of debilitating chemotherapy and numerous physical setbacks, Nalini was working on her research to the very end. Some of her last days of consciousness were spent meeting with students and colleagues in her hospital room contemplating data, discussing changes in the field, and planning new studies with as much enthusiasm as she had at the peak of her health. Nalini loved her work and it was her passion for understanding human thought and behavior that allowed her to endure through so many trying times: from her early challenges in graduate school through her brutal fight with cancer.

Among all of her accomplishments, though, one of the things that mattered most to Nalini was her students. Nalini received five separate mentorship awards during her career. Much like her own mentor, Bob Rosenthal, Nalini thought of her students not just as apprentices or trainees but as an extension of her family. Her warmth and sincere interest in her students' lives, professional and personal, engendered a strong feeling of reciprocation among most of her students. At Tufts, her graduate students nicknamed her "Momma Ambady" and had shirts made that brandished a "Team Ambady" logo across the front. She showed support for her students' development as individuals and continued to maintain this support even in cases where her students decided that academia, teaching, or research was not for them. She believed it was important that every person follow his or her own personal passion and was happy to help with that however she could, regardless of where that path ultimately ended.

Although Nalini passed away at a time when cultural neuroscience was still developing as a discipline, her early contributions to the field helped substantially with those initial stages of growth. She therefore leaves behind a legacy in social psychology, cultural psychology, and the social and cultural neurosciences to which we are all beneficiaries. Her contributions to the field in terms of the findings that she generated, the training that she invested in some of the field's best researchers, and through her warmth and leadership are long lasting. We are left only to imagine how much more she would have given to the field and what unexpected new heights she might have reached had her prolific career not been curtailed so early. Yet she will live on not only in the memories of those who knew her personally but as each of us within the field stands upon the shoulders of her foundational work to help establish cultural neuroscience. Her life is an

inspiring example of excellence in science and of how perseverance, passion, and unexpected luck can transform one's life and make an impact beyond what one might ever expect one could.

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