

See No Bias

Many Americans believe they are not prejudiced. Now a new test provides powerful evidence that a majority of us really are.

By Shankar Vedantam

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AT 4 O'CLOCK ON A RECENT WEDNESDAY AFTERNOON, a 34-year-old white woman sat down in her Washington office to take a psychological test. Her office decor attested to her passion for civil rights -- as a senior activist at a national gay rights organization, and as a lesbian herself, fighting bias and discrimination is what gets her out of bed every morning. A rainbow flag rested in a mug on her desk.

The woman brought up a test on her computer from a Harvard University Web site. It was really very simple: All it asked her to do was distinguish between a series of black and white faces. When she saw a black face she was to hit a key on the left, when she saw a white face she was to hit a key on the right. Next, she was asked to distinguish between a series of positive and negative words. Words such as "glorious" and "wonderful" required a left key, words such as "nasty" and "awful" required a right key. The test remained simple when two categories were combined: The activist hit the left key if she saw either a white face or a positive word, and hit the right key if she saw either a black face or a negative word.

Then the groupings were reversed. The woman's index fingers hovered over her keyboard. The test now required her to group black faces with positive words, and white faces with negative words. She leaned forward intently. She made no mistakes, but it took her longer to correctly sort the words and images.

Her result appeared on the screen, and the activist became very silent. The test found she had a bias for whites over blacks.

"It surprises me I have any preferences at all," she said. "By the work I do, by my education, my background. I'm progressive, and I think I have no bias. Being a minority myself, I don't feel I should or would have biases."

Although the activist had initially agreed to be identified, she and a male colleague who volunteered to take the tests requested anonymity after seeing their results. The man, who also is gay, did not show a race bias. But a second test found that both activists held biases against homosexuals -- they more quickly associated words such as "humiliate" and "painful" with gays and words such as "beautiful" and "glorious" with heterosexuals.

If anything, both activists reasoned, they ought to have shown a bias in favor of gay people. The man's social life, his professional circle and his work revolve around gay culture. His home, he said, is in Washington's "gayborhood."

"I'm surprised," the woman said. She bit her lip. "And disappointed."

MAHZARIN BANAJI WILL NEVER FORGET HER OWN RESULTS THE FIRST TIME SHE TOOK A BIAS TEST, now widely known as the Implicit Association Test. But whom could she blame? After all, she'd finally found what she was looking for.

Growing up in India, Banaji had studied psychophysics, the psychological representation of physical objects: A 20-watt bulb may be twice as bright as a 10-watt bulb, for example, but if the two bulbs are next to each other, a person may guess the difference is only 5 watts. Banaji enjoyed the precision of the field, but she realized that she found people and their behavior toward one another much more interesting. The problem was that there was no accurate way to gauge people's attitudes. You had to trust what they told you, and when it came to things such as prejudice -- say, against blacks or poor people -- people usually gave politically correct answers. It wasn't just that people lied to psychologists -- when it came to certain sensitive topics, they often lied to themselves. Banaji began to wonder: Was it possible to create something that could divine what people really felt -- even if they weren't aware of it themselves?

The results of one of Banaji's experiments as a young scholar at Yale University encouraged her. She and her colleagues replicated a well-known experiment devised by psychologist Larry Jacoby. Volunteers were first shown a list of unfamiliar names such as Sebastian Weisdorf. The volunteers later picked out that name when asked to identify famous people from a list of famous and unknown names. Because they had become familiar with the name, people mistakenly assumed Sebastian Weisdorf was a famous man. The experiment showed how subtle cues can cause errors without people's awareness.

Banaji and her colleagues came up with a twist. Instead of Sebastian Weisdorf, they asked, what if the name was Sally Weisdorf? It turned out that female names were less likely to elicit the false-fame error; volunteers did not say Sally Weisdorf was a famous woman. Women, it appeared, had to be more than familiar to be considered famous. Banaji had stumbled on an indirect measure of gender bias.

She began scouting for other techniques. In 1994, Anthony Greenwald, Banaji's PhD adviser and later her collaborator, came up with a breakthrough. Working out of the University of Washington, Greenwald drew up a list of 25 insect names such as wasp, cricket and cockroach, 25 flower names such as rose, tulip and daffodil, and a list of pleasant and unpleasant words. Given a random list of these words and told to sort them into the four groups, it was very easy to put each word in the right category. It was just as easy when insects were grouped with unpleasant words and flowers were grouped with pleasant words.

But when insects were grouped with pleasant words, and flowers with unpleasant words, the task became unexpectedly difficult. It was harder to hold a mental association of insects with words such as "dream," "candy" and "heaven," and flowers with words such as "evil," "poison" and "devil." It took longer to complete the task.

Psychologists have long used time differences to measure the relative difficulty of tasks. The new test produced astonishing results. Greenwald took the next step: Instead of insects and flowers, he used stereotypically white-sounding names such as Adam and Chip and black-sounding names such as Alonzo and Jamel and grouped them with the pleasant and unpleasant words. He ran the test on himself.

"I don't know whether to tell you I was elated or depressed," he says. "It was as if African American names were insect names and European American names were flower names. I had as much trouble pairing African American names with pleasant words as I did insect names with pleasant words."

Greenwald sent Banaji the computer test. She quickly discovered that her results were similar to his. Incredulous, she reversed the order of the names in the test. She switched the left and right keys. The answer wouldn't budge.

"I was deeply embarrassed," she recalls. "I was humbled in a way that few experiences in my life have humbled me."

The Implicit Association Test is designed to examine which words and concepts are strongly paired in people's minds. For example, "lightning" is associated with "thunder," rather than with "horses," just as "salt" is associated with "pepper," "day" with "night." The reason Banaji and Greenwald still find it difficult to associate black faces with pleasant words, they believe, is the same reason it is harder to associate lightning with horses than with thunder. Connecting concepts that the mind perceives as incompatible simply takes extra time. The time difference can be quantified and, the creators of the test argue, is an objective measure of people's implicit attitudes.

For years, Banaji had told students that ugly prejudices were not just in other people but inside themselves. As Banaji stared at her results, the cliché felt viscerally true.

IN TIME, OTHER EXPERIMENTS WOULD SUPPORT THE IDEA THAT THESE TESTS WERE MORE THAN JUST AN INTERESTING EXERCISE: The tests were better predictors of many behaviors than people's explicit opinions were. They predicted preferences on matters of public policy -- even ideological affiliations. Banaji and others soon developed tests for bias against gays, women and foreigners. The bias tests, which have now been taken by more than 2 million people, 90 percent of them American, and used in hundreds of research studies, have arguably revolutionized the study of prejudice. In their simplicity, the tests have raised provocative questions about this nation's ideal of a meritocracy and the nature of America's red state/blue state political divide. Civil rights activists say the tests have the potential to address some of the most corrosive problems of American society; critics, meanwhile, have simultaneously challenged the results and warned they could usher in an Orwellian world of thought crimes. Banaji has received death threats from supremacist groups; sensing that the tests can detect secrets, officials from the Central Intelligence Agency have made discreet inquiries.

The results of the millions of tests that have been taken anonymously on the Harvard Web site and other sites hint at the potential impact of the research. Analyses of tens of thousands of tests found 88 percent of white people had a pro-white or anti-black implicit bias; nearly 83 percent of heterosexuals showed implicit biases for straight people over gays and lesbians; and more than two-thirds of non-Arab, non-Muslim volunteers displayed implicit biases against Arab Muslims.

Overall, according to the researchers, large majorities showed biases for Christians over Jews, the rich over the poor, and men's careers over women's careers. The results contrasted sharply with what most people said about themselves -- that they had no biases. The tests also revealed another unsettling truth: Minorities internalized the same biases as majority groups. Some 48 percent of blacks showed a pro-white or anti-black bias; 36 percent of Arab Muslims showed an anti-Muslim bias; and 38 percent of gays and lesbians showed a bias for straight people over homosexuals.

"The Implicit Association Test measures the thumbprint of the culture on our minds," says Banaji, one of three researchers who developed the test and its most ardent proponent. "If Europeans had been carted to Africa as slaves, blacks would have the same beliefs about whites that whites now have about blacks."

As the tests have been refined, replicated and reinterpreted over the past decade, they have challenged many popular notions -- beginning with the increasingly common assertion that discrimination is a thing of the past.

The research has also upset notions of how prejudice can best be addressed. Through much of the 20th century, activists believed that biases were merely errors of conscious thought that could be corrected through education. This hopeful idea is behind the popularity of diversity training. But Banaji suggests such training relies on the wrong idea of how people form biases.

There is likely a biological reason people so quickly make assumptions -- good or bad -- about others, Banaji says. The implicit system is likely a part of the "primitive" brain, designed to be reactive rather than reasoned. It specializes in quick generalizations, not subtle distinctions. Such mental shortcuts probably helped our ancestors survive. It was more important when they encountered a snake in the jungle to leap back swiftly than to deduce whether the snake belonged to a poisonous species. The same mental shortcuts in the urban jungles of the 21st century are what cause people to form unwelcome stereotypes about other people, Banaji says. People revert to the shortcuts simply because they require less effort. But powerful as such assumptions are, they are far from permanent, she says. The latest research, in fact, suggests these attitudes are highly malleable.

Such reassurance has not assuaged test takers, who are frequently shocked by their results. The tests are stupid, and the results are wrong, some say. People have argued that the tests are measures of only hand-eye coordination or manual dexterity. Some have complained about which groups are assigned to the left- and right-hand keys, and about

how the computer switches those categories. None of these factors has any real impact on the results, but Banaji believes the complaints are a sign of embarrassment. Americans find evidence of implicit bias particularly galling, Banaji theorizes, because more than any other nation, America is obsessed with the ideal of fairness. Most of the people approached for this article declined to participate. Several prominent politicians, Republican and Democrat, declined to take the tests for this article. The aide to one senator bristled, "You think he is a racist!"

But the tests do not measure actions. The race test, for example, does not measure racism as much as a race bias. Banaji is the first to say people ought to be judged by how they behave, not how they think. She tells incredulous volunteers who show biases that it does not mean they will always act in biased ways -- people can consciously override their biases. But she also acknowledges a sad finding of the research: Although people may wish to act in egalitarian ways, implicit biases are a powerful predictor of how they actually behave.

PEOPLE WHO FIND THEIR WAY TO THE HARVARD WEB SITE THAT HOSTS THE IMPLICIT ASSOCIATION TEST are asked a few questions about themselves. The tests are anonymous, but volunteers are asked about their sex, race and whether they consider themselves liberal or conservative.

The voluntary questionnaires have allowed Banaji and her colleagues to arrive at one of the most provocative conclusions of the research: Conservatives, on average, show higher levels of bias against gays, blacks and Arabs than liberals, says Brian Nosek, a psychologist at the University of Virginia and a principal IAT researcher with Greenwald and Banaji. In turn, bias against blacks and Arabs predicts policy preferences on affirmative action and racial profiling. This suggests that implicit attitudes affect more than snap judgments -- they play a role in positions arrived at after careful consideration.

Brian Jones, a Republican National Committee spokesman, says the findings are interesting in an academic context but questions whether they have much relevance in the real world. "It's interesting to ponder how people implicitly make decisions, but ultimately we live in a world where explicit thoughts and actions are the bottom line," he says. Volunteers drawn to the tests were not a random sample of Americans, Jones adds, cautioning against reading too much into the conclusions.

Though it's true that about two-thirds of test takers lean liberal, Banaji says, the sample sizes are so large that randomness is not a serious concern. And Andy Poehlman, a graduate student at Yale, has tracked 61 academic studies using the IAT to explore how implicit attitudes predict people's actions.

When volunteers who took the race bias test were given the option to work with a white or black partner, one study found, those with the strongest implicit bias scores on the test tended to choose a white partner. Another study found that volunteers with lower bias scores against gays were more willing to interact with a stranger holding a book with an obviously gay theme. A third experiment found that when volunteers were told that

another person was gay, those whose scores indicated more bias against gays were more likely to avoid eye contact and show other signs of unfriendliness. A study in Germany by psychologist Arnd Florack found that volunteers whose results suggested more bias against Turks -- an immigrant group -- were more likely to find a Turkish suspect guilty when asked to make a judgment about criminality in an ambiguous situation.

In another study by psychologist Robert W. Livingston at the University of Wisconsin, Poehlman says, volunteers were given details of a crime in which a Milwaukee woman had been assaulted, suffered a concussion and required several stitches. In this case, Poehlman says, some volunteers were told the perpetrator had been proven to be David Edmonds from Canada. Others were told the guilty perpetrator was Juan Luis Martinez from Mexico. Volunteers were asked what length of sentence was appropriate for the crime: Bias scores against Hispanics on the implicit tests tended to predict a longer sentence for the Mexican.

An implicit attitude "doesn't control our behavior in a be-all and end-all kind of way, but it flavors our behavior in a pretty consistent way," says Poehlman.

In perhaps the most dramatic real-world correlate of the bias tests, economists at the Massachusetts Institute of Technology and the University of Chicago recently sent out 5,000 résumés to 1,250 employers who had help-wanted ads in Chicago and Boston. The résumés were culled from Internet Web sites and mailed out with one crucial change: Some applicants were given stereotypically white-sounding names such as Greg; others were given black-sounding names such as Tyrone.

Interviews beforehand with human resources managers at many companies in Boston and Chicago had led the economists to believe that black applicants would be more likely to get interview calls: Employers said they were hungry for qualified minorities and were aggressively seeking diversity. Every employer got four résumés: an average white applicant, an average black applicant, a highly skilled white applicant and a highly skilled black applicant.

The economists measured only one outcome: Which résumés triggered callbacks?

To the economists' surprise, the résumés with white-sounding names triggered 50 percent more callbacks than résumés with black-sounding names. Furthermore, the researchers found that the high-quality black résumés drew no more calls than the average black résumés. Highly skilled candidates with white names got more calls than average white candidates, but lower-skilled candidates with white names got many more callbacks than even highly skilled black applicants.

"Fifty percent? That's huge," says Sendhil Mullainathan, an economist who led the study and who recently moved to Harvard to work with Banaji. Human resources managers were stunned by the results, he says. Explicit bias, says Mullainathan, can occur not only without the intent to discriminate, but despite explicit desires to recruit minorities. Implicit attitudes need only sway a few decisions to have large impact, he says. For

example, if implicit bias caused a recruiter to set one résumé aside, it could be just one of 100 decisions the recruiter made that day. Collectively, however, such decisions can have dramatically large consequences.

SAJ-NICOLE JONI WAS THE FIRST WOMAN TO BE HIRED AS AN APPLIED MATHEMATICS PROFESSOR AT MIT. It was 1977, and there were no women's bathrooms in her building. Joni was not particularly surprised. She had battled obstacles all her life. When she first declared -- at age 12 -- that she was going to be a mathematician, her announcement evoked gales of laughter at a family gathering. But opposition only made her more determined. After a successful stint at MIT, Joni worked for Microsoft and then launched a successful business consulting firm called the Cambridge International Group Ltd. Her recent book, *The Third Opinion*, stresses the importance of seeking diverse points of view.

Joni was recently introduced to Banaji and expressed interest in taking the Implicit Association Test. Like most volunteers, she did not think she had biases and believed strongly in "meeting people as they are, without looking at the color of their skin."

Given Joni's background, Banaji thought it would be interesting for her to take a bias test that examined whether Joni associated men or women with careers in science. Most people find it easier to associate men with the sciences -- but Joni was clearly not most people.

The test came up on the screen. Joni's fingers, trained for many years on the piano, flew as she classified a number of words such as "husband," "father," "mother" and "wife" between "male" and "female" groups. She then grouped words such as "chemistry," "history," "astronomy" and "music" under "science" or "liberal arts." The computer then asked her to group "male" with "science" and "female" with "liberal arts."

When the groupings were reversed, Joni had to group "male" words with "liberal arts," and "female" words with various disciplines in science. She made a mistake in classifying "uncle." She hesitated over "astronomy" and made a second mistake in classifying "physics."

The results popped up: "Your data show a strong association between science and Male relative to Female."

Joni's fingers tapped the table in frustration. "I fought for women to be scientists all my life," she said, incredulous. Banaji nodded sympathetically. Her own results on this test were similar.

While Banaji says such results show the pervasive power that cultural biases have even on those who are themselves the victims of such biases, critics of the Implicit Association Test have asked whether it might be merely measuring people's awareness of bias. In other words, might Joni and Banaji associate men with careers in science precisely because, as women who chose to be scientists, they were intimately familiar with the

obstacles? Alternatively, could the tests be picking up something about the larger culture, rather than about the individual herself?

Banaji says that researchers have shown the implicit tests are measuring more than mere awareness of bias, through studies that cancel out the effects of familiarity.

"Is the IAT picking up something about the culture?" Banaji asks. "Yes, but it is picking up that aspect of the culture that has gotten into your brain and mind."

On the race test, for example, a sophisticated brain-imaging study showed that implicit bias tests can predict fear responses among volunteers. Banaji and New York University neural scientist Elizabeth Phelps had white volunteers take the implicit race bias test and then undergo sophisticated brain scans called fMRIs, which measure instantaneous changes in brain activity. Those with the most bias on the implicit tests showed the most activity in the brain area called the amygdala, when photos of black faces, obtained from college yearbooks, were flashed before their eyes. The amygdala is part of the primitive brain involved with fear responses.

But the critics persist. Philip Tetlock, a professor of organizational behavior in the business school at the University of California at Berkeley, and Ohio State University psychology professor Hal Arkes argue that Jesse Jackson might score poorly on the test. They cite the civil rights leader's statement a decade ago that there was nothing more painful at that stage of his life "than to walk down the street and hear footsteps and start thinking about robbery. Then look around and see somebody white and feel relieved."

If a prominent black civil rights leader could hold such a bias, Tetlock and Arkes ask, what do bias scores really mean? Whatever the IAT is measuring, Tetlock and Arkes argue, it is not what people would call discrimination -- no one would dream of accusing Jesse Jackson of harboring feelings of hostility toward African Americans.

Banaji says Tetlock and Arkes are relying on an outmoded notion of discrimination. The IAT research shows that hostility is not needed for discrimination to occur. Women and minorities can just as easily harbor biases, absorbed from the larger culture, that can lead them to discriminate against people like themselves.

Tetlock says he thinks the IAT research project is drawing conclusions much more sweeping than are justified.

"One of the key points in contention is not a psychological point, it is a political point," says Tetlock. "It is where we are going to set our threshold of proof for saying something represents prejudice. My view is the implicit prejudice program sets the threshold at a historical low."

By the standards of slavery and segregation, the critics argue, delays in mental associations are trivial. "We've come a long way from Selma, Alabama, if we have to calibrate prejudice in milliseconds," says Tetlock.

But the biases that the tests uncover are not trivial, Banaji counters. Their consequences, while subtler, could be devastating. In settings such as the criminal justice system, she argues, lives may hang in the balance.

In their most controversial argument, Tetlock and Arkes asked whether some implicit biases might simply be politically incorrect truths. By comparing national statistics of violent crime against census figures of different ethnic groups, the researchers argued it was more likely for a violent crime to be perpetrated by an African American man than a white man. Would it not therefore be rational, they asked, for people to hold biases against blacks?

Even here, however, rationality did not appear to be the prime mover, Banaji argues. Even if whites and blacks committed crimes at exactly the same rate, Banaji says, people would assign greater weight to the black crimes. This phenomenon is known as an illusory correlation: Aberrational behavior by a member of a minority group is not only given greater prominence in the mind but is also more easily associated with the entire group, rather than just the individual. "When in-groups do bad things, we think it is individual behavior or circumstance," says Jerry Kang, a UCLA law professor who is interested in policy applications of the research. "I screw up because it is a bad day; others screw up because they are incompetent."

THE APPARENT ABILITY OF THE IMPLICIT ASSOCIATION TEST TO DETECT HIDDEN ATTITUDES AND PREDICT BEHAVIOR has raised questions about its potential uses. Might it predict, for example, which police officers are likely to mistakenly shoot an unarmed black man? Should such tests be used to cull juries of people with high bias scores? Might employers use such tests to weed out potential racists? Might employees trying to prove discrimination demand that their bosses take bias tests?

The problem, Banaji says, is that all those uses assume that someone who shows bias on the test will always act in a biased manner. Because this isn't true, Banaji and her colleagues argue against the use of the IAT as a selection tool or a means to prove discrimination. Banaji says she and her colleagues will testify in court against any attempt to use the test to identify biased individuals.

Another reason to limit the IAT's use: Research has shown that individuals who are highly motivated can successfully fool the tests by temporarily holding counter-stereotypes in their minds. (Other attempts to fool the tests -- such as consciously attempting to respond faster or slower -- tend to change results only slightly, if at all, Banaji says.) Banaji hesitates to perform real-world studies that examine, for instance, whether police officers with the most bias are the most likely to shoot an unarmed suspect in an ambiguous situation, because the results of such studies could be subpoenaed and used in lawsuits against police departments. The researchers say they want to keep the focus of the tests on public education and research. They are wary of having the tests used in lawsuits, because if people feared their results might one day be used against them, they would be hesitant to use the tests for personal education.

Banaji says she is keenly aware that psychology has a long history of tests -- starting with the "lie-detector" polygraph -- that have been hyped and misused. Personality tests that lack the rigor of the Implicit Association Test have been widely used by companies in employee training and even hiring. Atop Banaji's desk at work is a bust of a human skull marked with different brain areas once thought to be responsible for different emotions: a representation of the discredited science of phrenology. The bust is a daily warning about the many failed ways science has promised to unlock people's minds and personalities.

But even as Banaji hears from critics who say the Implicit Association Test, which is not patented, will get misused, some proponents tell her it would be unethical not to use the test to screen officials who make life-and-death decisions about others. One test in a British jail showed that, compared with other criminals, pedophiles had implicit associations linking children and sexual attraction. Should such tests be used to determine which pedophiles have been rehabilitated and should be eligible for parole or, more controversially, as a law enforcement tool to evaluate which individuals are at risk of harming children?

"People ask me, 'How do you sleep at night knowing this can be misused?'" Banaji says. "Others ask me, 'How do you sleep at night knowing this won't be used fully?'"

IN SEPTEMBER, 50 TOP LEHMAN BROTHERS EXECUTIVES GATHERED IN A CONFERENCE ROOM ON THE FIFTH FLOOR OF THE PALACE HOTEL on Madison Avenue, across from New York's St. Patrick's Cathedral. They were a self-assured, competitive bunch, the type of crowd that usually views academics with skepticism. The executives had assembled for one of the leadership training programs that the firm mandates, and the mood in the room was very much "uh-huh, uh-huh," and "here we go again," says Barbara Byrne, a senior executive at the company who was present.

Banaji told the executives she was going to test their skills of observation. She played a video of a basketball game. Shot in black-and-white, the video showed a swift series of basketball passes between players with rapidly changing positions. Banaji asked the executives to count the number of passes. The group loved competitive exercises. As soon as the short clip was over, answers came flying from all sides: Five! Seven! Eleven!

Banaji asked whether anyone had seen anything unusual? No one had noticed anything out of place. Banaji played the video again, this time instructing her audience not to pay any attention to the basketball passes. Halfway through the video clip, a woman with an open umbrella slowly walked through the frame from one end to the other. Stunned at what they had missed, the executives collapsed in helpless laughter.

"I sat there and said, God, it wasn't subtle," says Byrne. "It was a woman with an open umbrella. It was right in front of your eyes. But you were so focused on counting the basketballs, that part of your brain was not functioning."

Banaji's point was that human beings filter what they see through the lenses of their own expectations. People believe they are acting rationally, but numerous psychological tests prove that subtle cues influence people all the time without their knowledge.

"You thought to yourself, Maybe [hidden biases] could influence me in other ways," Byrne says.

No one knows exactly why people develop implicit biases. Living in a diverse neighborhood does not in itself seem to reduce bias, but having close friendships with people from other ethnic groups does appear to lower bias, the IAT researchers have found. Saj-nicole Joni, who is white, for example, did not have test results showing a race bias and said she has long been close friends with an African American woman. Morgan Walls, an African American woman who works at the Peace Corps in the District, used to work in Thailand and has retained her connections with Asia. Her test suggested no bias toward European Americans or Asian Americans. Jeff Chenoweth, the director of national operations at the Catholic Legal Immigration Network in Washington, appeared to have no bias against Arab Muslims compared with people from other parts of the world. As he took the tests, Chenoweth, a white man and a devout evangelical, said he was planning to have two Iraqi Shiite Muslims over to his home for Christmas dinner. "I've lived as a minority in an Arab country and have 10 close friends who are Arab," he said.

Banaji herself shows no implicit biases against gays or Jews -- a result, she believes, of an upbringing where explicit biases against those groups were largely nonexistent.

There is growing evidence that implicit attitudes can be changed through exposure to counter-stereotypes. When the race test is administered by a black man, test takers' implicit bias toward blacks is reduced, says Irene Blair, a University of Colorado psychologist who recently conducted a review of studies that looked at how attitudes could be changed. Volunteers who mentally visualized a strong woman for a few seconds -- some thought of athletes, some thought of professionals, some thought of the strength it takes to be a homemaker -- had lower bias scores on gender tests. Having people think of black exemplars such as Bill Cosby or Michael Jordan lowered race bias scores. One experiment found that stereotypes about women became weaker after test takers watched a Chinese woman use chopsticks and became stronger after they watched the woman put on makeup. Interventions as brief as a few seconds had effects that lasted at least as long as 24 hours. But the volunteers were not aware of their attitudes having been changed.

Having counter-stereotypical experiences, in other words, might be much like going on a new diet with healthier food. Just as healthy eating can have a subtle impact on how people look and feel, counter-stereotypical experiences sustained throughout one's life seem to subtly change how one thinks. But, Banaji says, such experiences may not eliminate bias altogether.

Banaji believes that conscious efforts are needed to fight what she calls ordinary prejudice, the primitive brain filtering the world through its biased lenses without the

conscious part of the brain being aware of it. Tests have shown, for example, that when people are given a sense of power, they show greater biases than they did before. As a result, workplaces that are explicitly more egalitarian might be implicitly less biased, she says. Since Mullainathan found startling differences in his résumé study, he says, he has come to believe that personal identifiers should be removed from résumés to make evaluations more fair. Another area highly prone to implicit biases is job interviews, says Max Bazerman of Harvard Business School. "What you need to do is look at objective measures separate from the interview."

Banaji and Kang believe the IAT can be used as one measure to determine when affirmative action policies ought to be ended. Rather than pick an arbitrary amount of time -- Supreme Court Justice Sandra Day O'Connor recently suggested 25 years -- the researchers asked whether such policies should expire when implicit tests show that people are really evaluating others without bias. Banaji and Kang are less interested in using affirmative action to redress historical wrongs -- they argue it is essential to fight discrimination still taking place today.

Lani Guinier, President Bill Clinton's unsuccessful nominee for assistant attorney general for civil rights and now a professor at Harvard, is a fan of Banaji's work. But she says she worries the IAT will usher in superficial changes. The decor on the walls might be important, she says, but it isn't the real problem. "I worry people will think you can depress [implicit bias] scores through sporadic interventions," she says. "That will channel our efforts toward reform in potentially modest ways that don't fundamentally change the cultural swamp in which we are living."

Banaji disagrees. Decades of research in social psychology, she says, have demonstrated that small cues can have powerful impact on the way people think and behave. Finding evidence of implicit bias, she says, is like driving a car and discovering that, although the steering wheel is being held straight, the vehicle is drifting to one side. Banaji's solution: However strange it may feel, the driver should consciously hold the steering wheel against the known bias.

"The implicit system is dumb," Banaji says. "It reacts to what it sees. That is its drawback. But if we change the environment, we can change our attitudes."

ALMOST FROM THE MOMENT BANAJI TOOK THAT FIRST RACE TEST, she says, she has applied her research to her own life. Her office at Harvard is testimony. At eye level on a bookshelf are postcards of famous women and African Americans: George Washington Carver, Emma Goldman, Miles Davis, Marie Curie, Frederick Douglass and Langston Hughes. During one interview, she wore a brooch on her jacket depicting Africa. What might seem like political correctness to some is an evidence-based intervention to combat her own biases, Banaji says.

People's minds do not function with the detachment of machines, she says. For example, when she was recently asked to help select a psychologist for an award, Banaji says, she and two other panelists drew up a list of potential winners. But then they realized that

their implicit biases might have eliminated many worthy candidates. So they came up with a new approach. They alphabetically went down a list of all the psychologists who were in the pool and evaluated each in turn.

"Mind bugs operate without us being conscious of them," Banaji says. "They are not special things that happen in our heart because we are evil."

But assumptions lead to attitudes, and attitudes lead to choices with moral and political consequences. So, whether she is in a classroom or a grocery store, Banaji says, she forces herself to engage with people she might otherwise have avoided.

Just before Halloween, Banaji says, she was in a Crate & Barrel store when she spied a young woman in a Goth outfit. The woman had spiky hair that stuck out in all directions. Her body was pierced with studs. Her skull was tattooed. Banaji's instant reaction was distaste. But then she remembered her resolution. She turned to make eye contact with the woman and opened a conversation.

Shankar Vedantam covers science and human behavior for The Post's National desk. He will be fielding questions and comments about this article Monday at 1 p.m. at washingtonpost.com/liveonline.

How the Web Version Of the Implicit Association Test Works

By linking together words and images, the race bias test measures what associations come most easily to mind. People who take the Web version are asked to classify a series of faces into two categories, black American and white American. They are then asked to mentally associate the white and black faces with words such as "joy" and "failure." Under time pressure, many Americans find it easier to group words such as "failure" with black faces, and words such as "joy" with white faces. The test "measures the thumbprint of the culture on our minds," says Harvard psychologist Mahzarin Banaji.

To take the Implicit Association Test, go to <https://implicit.harvard.edu>.

To better understand how the test works and your results, go to <https://implicit.harvard.edu/implicit/demo/faqs.html>

The Paper Version Of the Implicit Association Test

This test was designed by University of Washington psychologist Anthony Greenwald. It is intended to measure how easily people associate home- and career-related words with either men or women. If you can, time yourself as you do Part 1 and compare the result with how long it takes to do Part 2. Many people find grouping men with home words takes longer than grouping women with home words -- evidence of a possible gender bias. Do you think your results occurred because you took the tests in a particular order? You can repeat the tests again, this time pairing men with career words in Part 1 and women with career words in Part 2. Whichever part took longer the first time should be

shorter this time, and vice versa. Results from the Web version are considered more reliable than those from the paper version.

Part 1

The words in this first list are in four categories. MALE NAMES and FEMALE NAMES are in CAPITAL letters. Home-related and career-related words are in lowercase. Go through the list from left to right, line by line, putting a line through only each MALE NAME and each home-related word. Do this as fast as you can.

executive LISA housework SARAH entrepreneur DEREK silverware MATT cleaning
TAMMY career BILL corporation VICKY office STEVE administrator PAUL home
AMY employment PEGGY dishwasher MARK babies BOB marriage MIKE
professional MARY merchant JEFF garden KEVIN family HOLLY salary SCOTT
shopping DIANA business DONNA manager EMILY laundry JOHN promotion KATE
commerce JILL kitchen GREG children JASON briefcase JOAN living room ANN
house ADAM

Part 2

The following list is the same as the one above. This time, go through the list putting a line through only each FEMALE NAME and each home-related word. Again do this as fast as you can.

executive LISA housework SARAH entrepreneur DEREK silverware MATT cleaning
TAMMY career BILL corporation VICKY office STEVE administrator PAUL home
AMY

employment PEGGY dishwasher MARK babies BOB marriage MIKE professional
MARY merchant JEFF garden KEVIN family HOLLY salary SCOTT shopping DIANA

business DONNA manager EMILY laundry JOHN promotion KATE commerce JILL
kitchen GREG children JASON briefcase JOAN living room ANN house ADAM

The Deese-Roediger-McDermott Test (Part 1)

Much as we like to believe that our perceptions and memories are always accurate, a number of experiments show people routinely make errors in how they see and remember things, without their being aware of it. Read the list of words in this box. Then refer to Part 2.

small

feelers

ugly

slimy

creepy

tiny

crawl

spider

fly

fright

bite

poison

ants

bug

web

The Deese-Roediger-McDermott Test (Part 2)

Go through the words in this list, without referring back to the other list. Check all of the words that you recall as being in the previous list. The explanation of the test is below.

bite

feelers

bed

fly

pillow

poison

sleep

bug

dream

insect

ants

web

slimy

night

blanket

Explanation: Harvard psychologist Mahzarin Banaji offers this test in lectures to show how easily a false memory can be created. Most people remember seeing the word "insect" in the first list. The mistake happens because the words in the first box were associated with insects: Unlike a machine, human memory is prone to error, because of reasonable-but incorrect-assumptions. "Mind bugs operate without us being conscious of them," Banaji says.

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