

RECENT and CLASSIC IMPLICIT BIAS LITERATURE

REPORTS ON IMPLICIT BIAS

1. The Science of Equality, Volume 1: Addressing Implicit Bias, Racial Anxiety, and Stereotype Threat in Education and Health Care [Godsil, Tropp, Goff & Powell, 2014]

http://perception.org/app/uploads/2014/11/Science-of-Equality-111214_web.pdf

- 90 page report
- Outlines consequences of racial bias in health care (and education), methods of countering bias, and means of improving potentially biased decision making.

2. State of The Science -- Implicit Bias Review 2014, 2015, 2016 [Kirwin Institute]

2014: <http://kirwaninstitute.osu.edu/wp-content/uploads/2014/03/2014-implicit-bias.pdf>

2015: <http://kirwaninstitute.osu.edu/wp-content/uploads/2015/05/2015-kirwan-implicit-bias.pdf>

2016: <http://kirwaninstitute.osu.edu/wp-content/uploads/2016/07/implicit-bias-2016.pdf>

- Each of these extensive reports summarizes the past year's findings on racial/ethnic implicit bias. The later reports discuss implicit bias as it relates to the fields of health, employment, education, criminal justice, and housing and to the mitigation of implicit bias.

3. Nature Special Issue on Sexism in Science [Women and Bias in Science and Scientific Careers] [March 2013]

<http://www.nature.com/news/specials/women/index.html>

Articles:

- MIND THE GENDER GAP: Despite improvements, female scientists continue to face discrimination, unequal pay and funding disparities. [Shen, 2013]
- Barred from the Boardroom: The number of women in scientific research is going up — but where academia crosses into industry, men still rule. [McCook, 2013]
- What's being female got to do with anything, ask the scientists who are starting labs and having kids. [Ledford, Petherick, Abbott & Nordling, 2013]
- Most of us are biased: Let's move beyond denial, own up to our prejudices against women and retrain our brains to overcome them [Raymond, 2013]

4. Examining the Presence, Consequences, and Reduction in Implicit Bias in Health Care: A Narrative Review [Zescott, Blair & Stone, 2016]

<http://gpi.sagepub.com/content/early/2016/05/06/1368430216642029.full.pdf>

- "This review examines current evidence on the role that provider implicit bias may play in health disparities, and whether training in implicit bias can effectively reduce the biases that providers exhibit."
- "Directions for future research on the presence and consequences of provider implicit bias, and best practices for training to reduce such bias, will be discussed."

5. Unconscious (Implicit) Bias and Health Disparities: Where Do We Go from Here? (Blair, Steiner & Havranek, 2010)

<http://www.thepermanentejournal.org/files/Spring2011/HealthDisparities.pdf>

- “This article provides a research roadmap that spans investigations of the presence of implicit bias in health care settings, identification of mechanisms through which implicit bias operates, and interventions that may prevent or ameliorate its effects.”
- “The goal of the roadmap is to expand and revitalize efforts to understand implicit bias and, ultimately, eliminate health disparities. Concrete suggestions are offered for individuals in different roles, including clinicians, researchers, policymakers, patients, and community members.”

ADMISSIONS, HIRING AND PAY IN SCIENCE & MEDICINE

4. Graduating to a Pay Gap: The Earnings of Women and Men One Year after College Graduation [Corbett & Hill, 2012]

<http://www.aauw.org/files/2013/02/graduating-to-a-pay-gap-the-earnings-of-women-and-men-one-year-after-college-graduation.pdf>

- In 2009—the most recent year for which data are available—women one year out of college who were working full time earned, on average, just 82 percent of what their male peers earned. In an analysis by the American Association of University Women, 2/3 of this gap in pay between male and female college graduates is attributable to education and employment factors (career sector choices). 1/3 of the pay gap remains unexplained.
- There were no significant pay differences between men and women who majored in science or healthcare disciplines or took work in life science professions.

5. How stereotypes impair women’s careers in science [Reuben, Sapienza, Zingales, 2014]

<http://www.pnas.org/content/111/12/4403.abstract>

- In a multi-part experiment, employers were tasked with hiring someone to do an arithmetic task. “When the employer had no information other than candidates’ physical appearance, women were only half as likely to be hired as men, because they were (erroneously) perceived as less talented for the arithmetic task: Both men and women expected women to perform worse.”
- When experimenters allowed candidates to self-report their performance, “women were chosen at equally low rates The reason is that men are more likely to boast about their performance, whereas women tend to underestimate it.”
- Additionally, the employers were given an Implicit Association Test. “The initial bias in employers’ beliefs correlated with implicit stereotypes about women and mathematics, as measured by the [IAT].” Also, those who had higher implicit bias were less likely to take into account that the women’s self-assessment of their skill was less boastful than the men’s self-assessment.

6. Gender Differences in Salary in a Recent Cohort of Early-Career Physician-Researchers [Jagsi et al., 2013]

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816636/>

- “The authors observed, in this recent cohort of elite, early-career physician-researchers, a gender difference in salary that was not fully explained by specialty, academic rank, work hours, or even spousal employment.”

- 7. Science faculty's subtle gender biases favor male students [Moss-Racusin, Dovidio, Brescoll, Graham & Handelsman, 2012]**
<http://www.pnas.org/content/109/41/16474.full>
- “In a randomized double-blind study (n = 127), science faculty from research-intensive universities rated the application materials of a student—who was randomly assigned either a male or female name—for a laboratory manager position.”
 - “Faculty participants rated the male applicant as significantly more competent and hireable than the (identical) female applicant. These participants also selected a higher starting salary and offered more career mentoring to the male applicant. The gender of the faculty participants did not affect responses, such that female and male faculty were equally likely to exhibit bias against the female student.”
- 8. Expectations of brilliance underlie gender distributions across academic disciplines [Leslie, Cimpian, Meyer & Freeland, 2015]**
<http://www.sciencemag.org/content/347/6219/262.full>
- A survey of academics in 30 disciplines (including STEM and non-STEM disciplines with both high and low female representation) designed to test the idea that the perception that a field requires innate talent predicts lower representation of females and racial minorities in that field.
 - The study found: “The extent to which practitioners of a discipline believe that success depends on sheer brilliance is a strong predictor of [lower] representation [of women and African Americans] in that discipline. Our data suggest that academics who wish to diversify their fields might want to downplay talk of innate intellectual giftedness and instead highlight the importance of sustained effort for top-level success in their field. We expect that such easily implementable changes would enhance the diversity of many academic fields.”
- 9. Women in Academic Science: A Changing Landscape [Ceci, Ginther, Kahn & Williams, 2014]**
<http://psi.sagepub.com/content/15/3/75.full>
- An overview of women's underrepresentation in math-intensive academic fields (as opposed to less math intensive fields in which women are better represented).
 - It finds: “Although in the past, gender discrimination was an important cause of women's underrepresentation in scientific academic careers, this claim has continued to be invoked after it has ceased being a valid cause of women's underrepresentation in math-intensive fields. Consequently, current barriers to women's full participation in mathematically intensive academic science fields are rooted in pre-college factors and the subsequent likelihood of majoring in these fields, and future research should focus on these barriers rather than misdirecting attention toward historical barriers that no longer account for women's underrepresentation in academic science.”
- 10. Exploring the color of glass: Letters of recommendation for female and male medical faculty (Trix & Psenka, 2003)**
<http://das.sagepub.com/content/14/2/191.short>
- A study examined over 300 letters of recommendation for medical faculty at a large American medical school in the mid-1990s.
 - “Letters written for female applicants were found to differ systematically from those written for male applicants in the extremes of length, in the percentages lacking in basic features, in the percentages with doubt raisers (an extended category of negative language, often associated with apparent commendation), and in frequency of mention of status terms.”

11. A Linguistic Comparison of Letters of Recommendation for Male and Female Chemistry and Biochemistry Job Applicants (Schmader, Whitehead & Wysocki, 2007)

<http://link.springer.com/article/10.1007/s11199-007-9291-4/fulltext.html>

- “Text analysis software was used to examine 886 letters of recommendation written on behalf of 235 male and 42 female applicants for either a chemistry or biochemistry faculty position at a large U.S. research university.”
- “Results revealed more similarities than differences in letters written for male and female candidates. However, recommenders used significantly more standout adjectives to describe male as compared to female candidates.”

12. Race, ethnicity, and NIH research awards (Ginther, Schaffer, Schnell, et al, 2011)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3412416/>

- Black applicants 10% less likely than Whites to receive NIH investigator initiated research grants after taking into account education, country of origin, training, previous research awards, publications, and employer.

13. What Happens Before? A Field Experiment Exploring How Pay and Representation Differentially Shape Bias on the Pathway Into Organizations [Milkman, Akinola, Chugh, 2015]

<https://www.apa.org/pubs/journals/releases/apl-0000022.pdf>

- Results indicate that in all broad disciplines except health sciences, when making requests of faculty for the future, women and minorities, collectively, are ignored at rates that differ from White male students. (While health sciences faculty were more likely to reply to resumes attached to white male names than names associated with female gender or other racial or ethnic backgrounds, the difference was not statistically significant.)

14. Whitened Resumes: Race and Self-Presentation in the Labor Market [Kang, DeCelles, Tilcsik & Jun, 2016]

<http://asq.sagepub.com/content/early/2016/03/09/0001839216639577>

- “Using interviews, a laboratory experiment, and a résumé audit study, we examine racial minorities’ attempts to avoid anticipated discrimination in labor markets by concealing or downplaying racial cues in job applications, a practice known as ‘résumé whitening.’”
- “Results show that when targeting an employer that presents itself as valuing diversity, minority job applicants engage in relatively little résumé whitening and thus submit more racially transparent résumés.”
- However, an additional study showed that organizations’ diversity statements were not associated with reduced discrimination against un-whitened resumes, suggesting that minorities may be more likely to experience discrimination against ostensibly “pro-diversity” employers.

15. Males Underestimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms [Grunspan, Eddy, Brownell, et al, 2016]

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0148405>

- “Among the 1,700 students surveyed in three introductory biology classes, female students nominated their peers equitably, while male students consistently ranked other male students as more intelligent than their female peers. Even after controlling for class performance and outspokenness, this bias increased over the course of the term.”
- This favoring of males by peers could influence student self-confidence, and thus persistence in this STEM discipline.

16. A lesson in bias: The relationship between implicit racial bias and performance in pedagogical contexts [Jacoby-Senghor, Sinclair & Shelton, 2016]

<http://www.sciencedirect.com/science/article/pii/S002210311530010X>

- In a study of pairs of Princeton undergraduates (either white-white or white-black), one acting as teacher and the other as student, implicit racial bias on the part of the teacher predicted lower test performance in the black, but not white, students.
- Further study suggested that the black students scored lower because of anxiety on the part of the instructor and poorer lesson quality. New participants watched video of the cross-race lessons to test lesson quality, and here instructors' implicit bias again predicted test performance of these participants.

COMBATting IMPLICIT BIAS

1. The Effect of an Intervention to Break the Gender Bias Habit for Faculty at One Institution: A Cluster Randomized, Controlled Trial [Carnes et al., 2014]

https://webcom.colostate.edu/cwge/files/2014/12/The_Effect_of_an_Intervention_to_Break_the_Gender.98931.pdf

- The authors implemented a pair-matched, single-blind, cluster randomized, controlled study of a gender-bias-habit-changing intervention at a large public university.
- Conclusion: "An intervention that facilitates intentional behavioral change can help faculty break the gender bias habit and change department climate in ways that should support the career advancement of women in academic medicine, science, and engineering."

2. A meta-analytic evaluation of diversity training outcomes [Kalinowski et al., 2012]

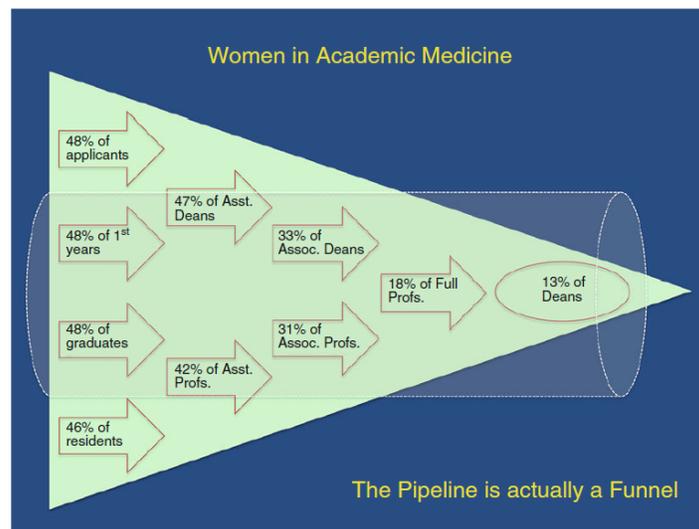
http://www.academia.edu/6058695/A_meta-analytic_evaluation_of_diversity_training_outcomes

- "Results from 65 studies (N= 8465) revealed sizable effects on affective-based, cognitive-based, and skill-based outcomes as well as interesting boundary conditions for these effects on affective-based outcomes. This study provides practical value to human resources managers and trainers wishing to implement diversity training within organizations as well as interesting theoretical advances for researchers."

3. How to Recognize and Address Unconscious Bias [Grewal, Ku, Girod & Valantine, 2013]

http://link.springer.com/chapter/10.1007%2F978-1-4614-5693-3_49#page-1

- "According to AAMC estimates, women make up only 35% of all medical school faculty and just 19% of faculty at the rank of Full Professor. African-Americans and those of Hispanic origin make up only about 7% of all medical school faculty."
- "We believe that until individuals and institutions address the issue of unconscious bias, faculty from underrepresented groups will continue to have a difficult time climbing the academic ladder. The aim of this chapter is to help the academic physician identify and understand unconscious bias so that he or she may take steps to prevent it from negatively influencing his or her career."



13. **Do Contact and Empathy Mitigate Bias Against Gay and Lesbian People Among Heterosexual First-Year Medical Students? A Report From the Medical Student CHANGE Study [Burke, Dovidio, Przeworski et al, 2015]**
<http://journals.lww.com/academicmedicine/pages/articleviewer.aspx?year=2015&issue=05000&article=00030&type=fulltext>
- “This study included the 4,441 heterosexual first-year medical students who participated in the baseline survey of the Medical Student Cognitive Habits and Growth Evaluation Study, which employed a stratified random sample of 49 U.S. medical schools in fall 2010.”
 - “Nearly half of respondents with complete data on both bias measures expressed at least some explicit bias, and most (81.51%) exhibited at least some implicit bias against gay and lesbian individuals. “
 - “Both amount and favorability of contact predicted positive implicit and explicit attitudes. Both cognitive and emotional empathy predicted positive explicit attitudes, but not implicit attitudes.”
14. **The mixed impact of medical school on medical students’ implicit and explicit weight bias [Phelan, Puhl, Burke et al. 2015]**
<http://onlinelibrary.wiley.com/doi/10.1111/medu.12770/full>
- “On average, implicit weight bias decreased and explicit [or conscious] bias increased during medical school, over a period of time in which implicit weight bias in the general public increased and explicit bias remained stable.”
 - To address this issue, “medical schools may [be able to] reduce students’ weight biases by increasing positive contact between students and patients with obesity, eliminating unprofessional role modelling by faculty members and residents, and altering curricula focused on treating difficult patients.”
15. **An Analysis of Implicit Bias in Medical Education [Wells, Motzkus, Cashman et al, 2016]**
<http://escholarship.umassmed.edu/ssp/239/>
- A qualitative analysis of an effort to teach implicit bias concepts to first-year students at the University of Massachusetts Medical School
16. **Reducing Implicit Gender Leadership Bias in Academic Medicine With an Educational Intervention. [Girod, Fassiotto, Grewal et al, 2016]**
<http://europepmc.org/abstract/med/26826068>

- “Analysis of a standardized, 20-minute educational intervention to reduce gender bias among academic health center faculty.”
- “Results indicated that the intervention significantly changed all faculty members' perceptions of bias ($P < .05$ across all eight measures). Although, as expected, explicit biases did not change following the intervention, the intervention did have a small but significant positive effect on the implicit biases surrounding women and leadership of all participants regardless of age or gender ($P = .008$).”

17. A “Scientific Diversity” Intervention to Reduce Gender Bias in a Sample of Life Scientists [Moss-Racusin, van der Toorn, Dovidio et al, 2016]

<http://www.lifescied.org/content/15/3/ar29.short>

- The evaluation of an intervention to reduce gender bias among undergraduate science educators.
- “Evidence emerged indicating the efficacy of the “Scientific Diversity” workshop, such that participants were more aware of gender bias, expressed less gender bias, and were more willing to engage in actions to reduce gender bias 2 weeks after participating in the intervention compared with 2 weeks before the intervention.”

18. Constructed Criteria: Redefining Merit to Justify Discrimination (Uhlmann & Cohen, 2005)

<http://pss.sagepub.com/content/16/6/474.short>

- In a series of studies, researchers showed that when hiring criteria were flexible, equally qualified females were less likely to be perceived as fit candidates for traditionally male jobs and conversely rate equally qualified male candidates lower for traditionally female jobs.
- Additionally, when raters were forced to decide in advance what criteria would be used to judge candidates, women were no less likely to be selected for a traditionally male job.

19. Reducing racial bias among health care providers: lessons from social-cognitive psychology (Burgess, Van Ryn, Dovidio, et al, 2007)

<http://link.springer.com/article/10.1007/s11606-007-0160-1/fulltext.html>

- An evidenced-based framework for interventions to combat unintentional bias among health care providers, drawing on social cognitive psychology.

20. Non-conscious bias in medical decision making: what can be done to reduce it? (Stone & Moskowitz, 2011)

<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2923.2011.04026.x/full>

- “When activated, implicit negative attitudes and stereotypes shape how medical professionals evaluate and interact with minority group patients.”
- “Cultural competence training involves teaching students to use race and ethnicity to diagnose and treat minority group patients, but to avoid stereotyping them by over-generalising cultural knowledge to individuals.” However, “psychological research shows that common approaches like stereotype suppression are ineffective for reducing non-conscious bias.”
- Workshops or other learning modules that help medical professionals learn strategies such as automatically activating egalitarian goals, looking for common identities and counter-stereotypical information, and taking the perspective of the minority group patient can be helpful.

HEALTH CARE PROVIDER/PROFESSIONAL IMPLICIT BIAS AND HEALTH CARE**1. A Systematic Review of the Extent and Measurement of Healthcare Provider Racism [Paradies, Truong & Priest, 2013]**

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3912280/>

- “Statistically significant evidence of racist beliefs, emotions or practices among healthcare providers in relation to minority groups was evident in 26 of [37 studies].”

2. Physician Implicit Attitudes and Stereotypes About Race and Quality of Medical Care [Sabin, Rivara & Greenwald, 2008]

<http://faculty.washington.edu/sabinja/Sabin2008.pdf>

- Study of physicians found implicit bias against African Americans versus European Americans and an association of the concepts of “compliant patient” and “preferred medical care” with European Americans rather than African Americans.
- Medical care recommended by subjects differed by patient race in 1 of 4 case vignettes.
- There was no significant relationship between measures of implicit racial bias and treatment recommendations.

3. The Influence of Implicit Bias on Treatment Recommendations for 4 Common Pediatric Conditions: Pain, Urinary Tract Infection, Attention Deficit Hyperactivity Disorder, and Asthma [Sabin & Greenwald, 2012]

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483921/>

- Using an online survey, researchers looked at the association between racial implicit bias among academic pediatricians and recommendations for pain management, urinary tract infections, attention deficit hyperactivity disorder, and asthma in case vignettes.
- “Pediatricians’ implicit (unconscious) attitudes and stereotypes were associated with treatment recommendations. The association between unconscious bias and patient’s race was statistically significant for prescribing a narcotic medication for pain following surgery. As pediatricians’ implicit pro-White bias increased, prescribing narcotic medication decreased for African American patients but not for the White patients. Self-reported attitudes about race were associated with some treatment recommendations.”

4. Physicians and Implicit Bias: How Doctors May Unwittingly Perpetuate Health Care Disparities [Chapman, Kaatz & Carnes, 2013]

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3797360/>

- Summarizes 18 articles on implicit bias and clinical decision making [1993-2012]
- Research supports a relationship between patient care and physician bias in ways that could perpetuate health care disparities.”
- There is evidence that implicit bias among health care providers impedes doctor-patient communication. “Research also supports a link between disparate treatment decisions and implicit provider bias [in terms of both gender and race.]”

- 5. An Investigation of Associations Between Clinicians' Ethnic or Racial Bias and Hypertension Treatment, Medication Adherence and Blood Pressure Control [Blair et al., 2014]**
<http://link.springer.com/article/10.1007%2Fs11606-014-2795-z>

 - A study of 138 primary care clinicians and 4,794 patients with hypertension found high rates of implicit racial and ethnic bias (as measured by the Implicit Association Tests) among clinicians and poorer hypertension control and treatment adherence among African American patients, but no association between clinician implicit bias and differences among African Americans and Latinos in treatment intensification, medication adherence, and hypertension control.

- 6. Do Physicians' Implicit Views of African Americans Affect Clinical Decision Making? [Oliver, Wells, Joy-Gaba, Hawkins & Nosek, 2014]**
<http://www.jabfm.org/content/27/2/177.full>

 - 543 family and internal medicine physicians displayed a strong implicit preference for whites over blacks and associated "medically cooperative" with whites over blacks. Physicians reported significantly greater liking for whites over blacks and reported believing whites were more medically cooperative than blacks. Participants reported providing similar care for white and black patients but agreed that subconscious biases could influence their treatment decisions.
 - There was no significant difference in the rate of recommendation for total knee replacement when the patient in a hypothetical clinical case was black (47%) versus white (38%), and neither implicit nor explicit racial biases predicted differential treatment recommendations by race.

- 7. Effect of race and sex on physicians' recommendations for cardiac catheterization (Schulman, Berlin, Harless, et al, 1999)**
<http://www.nejm.org/doi/full/10.1056/NEJM199902253400806#t=article>

 - A total of 720 physicians at two national meetings of organizations of primary care physicians viewed a recorded interview with a hypothetical patient and made recommendations about his or her care.
 - Women and blacks were less likely to be referred for cardiac catheterization than men and whites, respectively.
 - Black women were less likely to be referred for angiography (OR 0.4 (0.2-0.7), p =0.004) than white men.

- 8. Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients (Green, Carney, Pallin, et al, 2007)**
<http://link.springer.com/article/10.1007/s11606-007-0258-5>

 - To test whether physicians show implicit race bias and whether the magnitude of such bias predicts thrombolysis recommendations for black and white patients with acute coronary syndromes, 287 emergency medicine residents at academic medical centers were presented with a clinical vignette of either a black or white patient coming to the emergency department with an acute coronary syndrome, a questionnaire and three implicit association tests (IATs).
 - "As physicians' pro-white implicit bias increased, so did their likelihood of treating white patients and not treating black patients with thrombolysis (P = .009)."

9. Medical student bias and care recommendation for an obese versus non-obese virtual patient (Persky & Eccleston, 2011)

<http://www.ncbi.nlm.nih.gov/pubmed/20820169>

- A total of 76 clinical-level medical students were randomly assigned to interact with a digital, virtual female patient who was visibly either obese or non-obese.
- “Analyses revealed more negative stereotyping, less anticipated patient adherence, worse perceived health, more responsibility attributed for potentially weight-related presenting complaints and less visual contact directed toward the obese version of a virtual patient than the non-obese version of the patient.”
- “There was no clear evidence of bias in clinical recommendations made for the patient's care.”

10. Associations of clinicians' implicit attitudes about race with medical visit communication and patient ratings of interpersonal care (Cooper, Roter, Carson, et al, 2012)

<http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2011.300558>

- Researchers measured 40 primary care clinicians' implicit general race bias and race and compliance stereotyping with 2 implicit association tests and related them to audiotape measures of visit communication and ratings from 269 patients.
- The study found: “Clinician implicit race bias and race and compliance stereotyping are associated with markers of poor visit communication and poor ratings of care, particularly among Black patients.”

11. Implicit Racial/Ethnic Bias Among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review [Hall, Chapman, Lee, et al, 2015]

<http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2015.302903>

- The review included 15 studies. Almost all used cross-sectional designs, convenience sampling, US participants, and the Implicit Association Test to assess implicit bias.
- Low to moderate levels of implicit racial/ethnic bias, similar to the general population, were found among health care professionals in all but 1 study.
- Results mainly showed that “implicit bias was significantly related to patient–provider interactions, treatment decisions, treatment adherence, and patient health outcomes. Implicit attitudes were more often significantly related to patient–provider interactions and health outcomes than treatment processes.”

12. Health Care Providers' Implicit and Explicit Attitudes Toward Lesbian Women and Gay Men [Sabin, Riskind & Nosek, 2015]

<http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2015.302631>

- The study examined attitudes toward heterosexual people versus lesbian and gay people in a large sample of Implicit Association Test takers including 2338 medical doctors, 5379 nurses, 8531 mental health providers, 2735 other treatment providers, and 214 110 nonproviders in the United States and internationally.
- The study found: “Implicit preferences for heterosexual people versus lesbian and gay people are pervasive among heterosexual health care providers.”

13. Examining implicit bias of physicians who care for individuals with spinal cord injury: A pilot study and future directions [Hausmann, Myaskovsky, Niyonkuru et al, 2015]

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4293524/>

- Individuals with spinal cord injury completed questionnaires assessing mobility, physical independence, occupational functioning, social integration, self-reported health, depression and life satisfaction. Their physicians completed online implicit racial bias tests.
- “Physicians had a mean bias score of 0.62, indicating a strong pro-white/anti-black bias. Greater physician bias was associated with disability among individuals with SCI in the domain of social integration (odds ratio = 4.80, 95% confidence interval (CI) = 1.44, 16.04), as well as higher depression (B = 3.24, 95% CI = 1.06, 5.41) and lower life satisfaction (B = -4.54, 95% CI = -8.79, -0.28).”

14. Racial, Gender, and Socioeconomic Status Bias in Senior Medical Student Clinical Decision-Making: A National Survey [Williams, Romney, Kano, et al, 2015]

<http://link.springer.com/article/10.1007/s11606-014-3168-3>

- A survey of seniors at 84 medical schools, asked to choose between two clinically equivalent management options in response to cardiac patient vignettes, examining variation in recommendations based on patient race, gender, and SES.
- “Among 4,603 returned surveys, we found no evidence in the overall sample supporting racial or gender bias in student clinical decision-making.”
- “Patient socioeconomic status was the strongest predictor of student recommendations, with patients described as having the highest socioeconomic status most likely to receive procedural care recommendations.”

15. Evaluating Explicit and Implicit Stigma of Mental Illness in Mental Health Professionals and Medical Students [Kopera, Suszek, Myszka et al, 2015]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4475542/>

- “Results suggest that both non-professionals and professionals display ambivalent attitudes towards people with mental illness and that professional, long-term contact with people with mental illness does not necessarily modify negative implicit attitudes.”

16. The Effects of Oncologist Implicit Racial Bias in Racially Discordant Oncology Interactions [Penner, Dovidio, Albrecht et al, 2016]

<http://jco.ascopubs.org/content/early/2016/06/15/JCO.2015.66.3658.abstract>

- Oncologists completed an implicit racial bias measure before video-recorded treatment discussions with new black patients. Observers rated oncologist communication. Following interactions, patients answered questions about oncologists’ patient-centeredness and difficulty remembering contents of the interaction, distress, trust, and treatment perceptions.
- “As predicted, oncologists higher in implicit racial bias had shorter interactions, and patients and observers rated these oncologists’ communication as less patient-centered and supportive. Higher implicit bias also was associated with more patient difficulty remembering contents of the interaction. In addition, oncologist implicit bias indirectly predicted less patient confidence in recommended treatments, and greater perceived difficulty completing them, through its impact on oncologists’ communication (as rated by both patients and observers).”

17. The Role of Bias by Emergency Department Providers in Care for American Indian Children [Puumala, Burgess, Kharbanda et al, 2016]

[http://journals.lww.com/lww-](http://journals.lww.com/lww-medicalcare/Abstract/2016/06000/The_Role_of_Bias_by_Emergency_Department_Providers.3.aspx)

[medicalcare/Abstract/2016/06000/The_Role_of_Bias_by_Emergency_Department_Providers.3.aspx](http://journals.lww.com/lww-medicalcare/Abstract/2016/06000/The_Role_of_Bias_by_Emergency_Department_Providers.3.aspx)

- “We performed a cross-sectional survey of care providers at 5 hospitals in the Upper Midwest. Questions included American Indian stereotypes (explicit attitudes), clinical vignettes, and the Implicit Association Test.”
- “Agreement with negative American Indian stereotypes was 22%–32%.”
- “84% of providers had an implicit preference for non-Hispanic white adults or children.”
- “Responses to the vignettes were not related to implicit or explicit bias.”

18. Racial-Ethnic Disparities in Opioid Prescriptions at Emergency Department Visits for Conditions Commonly Associated with Prescription Drug Abuse [Singhal, Tien, Hsia, 2016]

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0159224>

- Using data from the National Hospital Ambulatory Medical Care Survey, the researchers “found significant racial-ethnic disparities, with non-Hispanic Blacks being less likely (adjusted odds ratio ranging from 0.56–0.67, p-value < 0.05) to receive opioid prescription at discharge during ED visits for back pain and abdominal pain, but not for toothache, fractures and kidney stones, compared to non-Hispanic whites after adjusting for other covariates.”

19. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites [Hoffman, Trwawalter, Axt & Oliver, 2016]

<http://www.pnas.org/content/113/16/4296.full.pdf>

- Two studies were undertaken to study how false beliefs about biological differences between blacks and whites might to systematic under-treatment of pain in blacks relative to pain in whites.
- Study 1 documented beliefs regarding biological differences in the experience of pain in lay persons and found that belief in such biological differences predicted reporting lower pain ratings for a black (vs. white) target.
- Study 2 extended the research to white medical students, finding again that belief in biological differences predicted lower ratings of pain in black vs. white patients and less accurate treatment recommendations.

20. The effects of racial attitudes on affect and engagement in racially discordant medical interactions between non-Black physicians and Black patients [Dovido, Eggly, Penner, 2016]

<http://gpi.sagepub.com/content/early/2016/05/03/1368430216641306.abstract>

- This study examined how physician explicit and implicit racial bias and patient perceived past discrimination influenced affect and level of engagement during a clinical encounter.
- “Physicians’ affect and engagement were influenced by their implicit and explicit racial bias (i.e., aversive racism), but only when they interacted with patients who reported any incidence of prior discrimination.”
- “In contrast, patients’ affect was influenced only by perceived discrimination.”

RACIAL BIAS

1. **Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination (Bertrand & Mullainathan, 2004)**
<http://www.ingentaconnect.com/content/aea/aer/2004/00000094/00000004/art00009>
 - Researchers sent fictitious resumes to help-wanted ads in Boston and Chicago newspapers, some with the white-sounding names “Emily and Gregg” and others with the black-sounding names Lakisha and Jamal.
 - White names received 50 percent more callbacks. The racial gap was consistent across occupation, industry, and employer size.

2. **What's in a Name? A Multiracial Investigation of the Role of Occupational Stereotypes in Selection Decisions (King, Mendoza, Madera, et al, 2006)**
<http://onlinelibrary.wiley.com/doi/10.1111/j.0021-9029.2006.00035.x/full>
 - Fictitious resumes of various qualities and with names of various racial groups were reviewed by white male participants.
 - “The results revealed that Asian American individuals were evaluated highly for high-status jobs, regardless of their résumé quality. White and Hispanic applicants both benefited from a high-quality résumé, but Black applicants were evaluated negatively, even with strong credentials.”

GENDER BIAS

1. **The impact of situational factors on personnel decisions concerning women: Varying the sex composition of the applicant pool (Heilman, 1980)**
<http://www.sciencedirect.com/science/article/pii/0030507380900744>
 - “One hundred male and female MBA students evaluated a woman applicant for a managerial position when the proportion of women in the applicant pool was varied.”
 - When more than 25% applicants in candidate pool were female, women more likely to be rated as qualified and recommended for hire.

2. **Sex Bias at Work: The Effects of Attentional and Memory Demands on Performance Ratings of Men and Women (Martell, 1991)**
<http://onlinelibrary.wiley.com/doi/10.1111/j.1559-1816.1991.tb00515.x/full>
 - “Two hundred and two subjects read a vignette depicting the work behavior of a male or female police officer and then rated the individual's work performance. The attentional demands imposed on subjects while reading the vignette and the amount of time elapsed prior to issuing the performance ratings were systematically varied.”
 - “As predicted, men were evaluated more favorably than women when raters were faced with an additional task requiring attention and time pressures were made salient. Only when subjects were able to carefully allocate all of their attentional resources did sex bias in work performance ratings abate.”

3. Double Standards in the Evaluation of Men and Women (Foschi, 1996)

<http://www.jstor.org/stable/2787021>

- Although subjects of both sexes achieved equal levels of performance on a perceptual task, women were held to a stricter standard of competence than men.
- In a second experiment, researchers adjusted the degree of accountability of the rater. “Results show a significant difference by sex of referent of standard when accountability was low, but not when it was increased.”

4. Orchestrating Impartiality: The Impact of “Blind” Auditions on Female Musicians (Goldin & Rouse, 1997)

<http://affectfinance.org/wp-content/uploads/2015/11/Goldin-Rouse-AER-2000.pdf>

- “A change in the audition procedures of symphony orchestras—adoption of “blind” auditions with a “screen” to conceal the candidate’s identity from the jury— provides a test for sex-biased hiring.”
- “Using data from actual auditions, in an individual fixed-effects framework, [the researchers found] that the screen increases the probability a woman will be advanced and hired.”

5. Description and Prescription: How Gender Stereotypes Prevent Women’s Ascent Up the Organizational Ladder (Heilman, 2001)

<http://onlinelibrary.wiley.com/doi/10.1111/0022-4537.00234/abstract>

- “It is proposed that gender stereotypes and the expectations they produce about both what women are like (descriptive) and how they should behave (prescriptive) can result in devaluation of their performance, denial of credit to them for their successes, or their penalization for being competent.”

6. No Credit Where Credit Is Due: Attributional Rationalization of Women’s Success in Male-Female Teams (Heilman & Haynes, 2005)

<http://psycnet.apa.org/journals/apl/90/5/905/>

- “In 3 experimental studies, the authors explored how ambiguity about the source of a successful joint performance outcome promotes attributional rationalization, negatively affecting evaluations of women. Participants read descriptions of a mixed-sex dyad’s work and were asked to evaluate its male and female members.”
- Unless individual contributions to a dyad’s successful joint outcome was defined by providing feedback about individual team member performance or by the way in which the task was said to have been structured or the negative expectations about women’s performance were challenged by clear evidence of prior work competence, the contribution of the female member was undervalued.

7. National differences in gender–science stereotypes predict national sex differences in science and math achievement (Nosek, Smyth, Siriam, et al, 2009)

<http://www.pnas.org/content/106/26/10593.long>

- “About 70% of more than half a million Implicit Association Tests completed by citizens of 34 countries revealed expected implicit stereotypes associating science with males more than with females.”
- “Nation-level implicit stereotypes predicted nation-level sex differences in 8th-grade science and mathematics achievement.”

8. Gender and double standards in the assessment of job applicants (Foschi, Lai & Sigerson, 1994)

<http://www.jstor.org/stable/2787159>

- Study participants were asked to choose between two average candidates with slightly different academic records one male and one female. In some cases the male applicant was slightly superior, in others the reverse.
- “Results for male subjects show that when the male candidate was the better performer, he was chosen more often, and was considered more competent and more suitable, than when the female candidate was in that position.”

MOTHERHOOD AND CAREER

1. Getting a Job: Is There a Motherhood Penalty? (Correll & Benard, 2007)

http://www.jstor.org/stable/10.1086/511799?seq=1#page_scan_tab_contents

- Study participants evaluated applications for a pair of same race, same gender applicants differing on parental status.
- “Mothers were rated as less competent, less committed, less suitable for hire, promotion, and management training, and deserving of lower salaries.”
- “Men were not penalized for being a parent, and in fact, appeared to benefit from having children on some measures.”

2. Motherhood: a potential source of bias in employment decisions (Heilman & Okimoto, 2008)

<http://psycnet.apa.org/journals/apl/93/1/189/>

- “Results of 2 experimental studies in which job incumbents were said to be applying for promotions to traditionally male positions demonstrated bias against mothers in competence expectations and in screening recommendations.”
- “This bias occurred regardless of whether the research participants were students (Study 1) or working people (Study 2). Although anticipated job commitment, achievement striving, and dependability were rated as generally lower for parents than for nonparents, anticipated competence was uniquely low for mothers.”

3. When Professionals Become Mothers, Warmth Doesn't Cut the Ice (Cuddy, Fiske & Glick, 2004)

<http://onlinelibrary.wiley.com/doi/10.1111/j.0022-4537.2004.00381.x/full>

- A study of 122 college students found that when working women become mothers they trade perceived competence for perceived warmth, while working men who become fathers gain perceived warmth and maintain perceived competence.
- “People report less interest in hiring, promoting, and educating working moms relative to working dads and childless employees.”
- Perceived competence predicts interest in hiring, promoting and educating workers.

OTHER IMPLICIT BIAS LITERATURE

1. Shifting standards and stereotype-based judgments [Biernat & Manis, 1994]

<http://psycnet.apa.org/journals/psp/66/1/5/>

- “Four studies, with a total of 431 undergraduates, tested a model of stereotype-based shifts in judgment standards developed by M. Biernat et al (see record 1991-18325-001).”
- “The model suggests that subjective judgments of target persons from different social groups may fail to reveal the stereotyped expectations of judges because they invite the use of different evaluative standards; more “objective” or common rule indicators reduce such standard shifts.”
- “The stereotypes that men are more competent than women, women are more verbally able than men, Whites are more verbally able than Blacks, and Blacks are more athletic than Whites were successfully used to demonstrate the shifting standards phenomenon.”

2. Automatic and controlled processes in stereotype priming (Blair & Banaji, 1996)

<http://psycnet.apa.org/psycinfo/1996-01769-004>

- In four experiments, the automatic activation of gender stereotypes and stereotype priming was observed.
- “Across 4 experiments, 3 patterns of data were observed: (a) evidence of stereotype priming under baseline conditions of intention and high cognitive constraints, (b) significant reduction of stereotype priming when a counter-stereotype intention was formed even though cognitive constraints were high, and (c) complete reversal of stereotype priming when a counter-stereotype intention was formed and cognitive constraints were low.”

3. Double standards for competence: Theory and research (Foschi, 2000)

<http://www.jstor.org/stable/223435>

- A review of theory and research on double standards.
- “The article focuses on double standards for competence in task groups and begins by examining how status characteristics (e.g. gender, ethnicity, socioeconomic class) become a basis for stricter standards for the lower status person.”