Annotated Bibliography for Implicit Association

DEFENSE EQUAL OPPORTUNITY MANAGEMENT INSTITUTE
DIRECTORATE OF RESEARCH DEVELOPMENT AND STRATEGIC INITIATIVES

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Barnes, S. M., Bahraini, N. H., Forster, J. E., Stearns-Yoder, K. A., Hostetter, T. A., Smith, G., … Nock, M. K. (2016). Moving beyond self-report: Implicit associations about death/life prospectively predict suicidal behavior among veterans. *Suicide and Life-Threatening Behavior*.

Purpose: In this study the predictive validity of an objective measure, the death/suicide Implicit Association Test (d/sIAT), was tested among psychiatrically hospitalized veterans.

Sample size: 176 participants

Methodology:

• Following acute stabilization, participants completed the d/sIAT and traditional suicide risk assessments.

Findings:

• Participants had similar d/sIAT scores regardless of whether they had recently attempted suicide.

• d/sIAT scores significantly predicted suicide attempts during the 6-month follow-up above and beyond other known risk factors for suicidal behavior.

Implications/Prevention Strategies:

• The d/sIAT may augment the accuracy of suicide risk assessment.

Future research: None.

Burke, S. E., Dovidio, J. F., Przedworski, J. M., Hardeman, R. R., Perry, S. P., Phelan, S. M., Nelson, D.B., Burgess, D.J., Yeazel, M.W., van Ryn, M. (2015). Do contact and empathy mitigate bias against gay and lesbian people among heterosexual medical students? A report from medical student CHANGES. *Acad Med.90* (5), 645–651.

Purpose: This study examined both explicit and implicit biases against lesbian women and gay men among medical students, focusing on two predictors of such bias, contact and empathy.

Sample size: 4,441 heterosexual first-year medical students

Methodology:

- We measured implicit attitudes using the IAT, a validated measure of automatic, unconscious attitudes that can be adapted to measure attitudes toward many different groups.
- The sexual orientation IAT in this study, which was identical to the Sexuality IAT from Project Implicit, compared the amounts of time required to categorize images associated with heterosexuality and homosexuality (e.g., line drawings of couples) at the same time as positive and negative words (e.g., joy, hurt).
- About half of the respondents in our sample (n = 2,141) were randomly assigned to complete this IAT; the rest were assigned to a different IAT and were excluded from our analysis procedures involving implicit bias in this report. (We retained all heterosexual respondents with complete data for analysis procedures involving our explicit attitude measure.)
- We computed IAT D-scores, representing differences in valenced associations with heterosexual and homosexual targets.
- Positive scores indicate positive implicit evaluations and negative scores indicate negative implicit evaluations of gay and lesbian people relative to heterosexual people.
- We chose this scoring system, even though it is the opposite of the traditional scoring system (in which larger positive scores indicate *more* bias), to facilitate comparison to the explicit attitude measure (the composite thermometer score).
- The students participated in the baseline survey of the Medical Student Cognitive Habits and Growth Evaluation Study (CHANGES), which employed a stratified random sample of 49 U.S. medical schools in fall 2010.
- The researchers measured explicit attitudes toward gay and lesbian people using feeling thermometer self-assessments, implicit attitudes using the Implicit Association Test (IAT), amount and favorability of contact using self-report items, and empathy using subscales of the Interpersonal Reactivity Index.

Findings:

- Nearly half of respondents with complete data on both bias measures expressed at least some explicit bias and most 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.

Implications/Prevention Strategies:

- Findings on contact and empathy point to possible curriculum-based interventions aimed at ensuring high-quality care for sexual minorities.

Future research:

- The prevalence of negative attitudes presents an important challenge for medical education, highlighting the need for more research on possible causes of bias.

Cha, C. B., Augenstein, T. M., Frost, K. H., Gallagher, K., D' Angelo, E. J., & Nock, M. K. Retrieved August 4, 2016, from Using implicit and explicit measures to predict nonsuicidal self-injury among adolescent inpatients, *American Academy of Child and Adolescent Psychiatry.*

Purpose: To examine the use of implicit and explicit measures to predict adolescent nonsuicidal self-injury (NSSI) before, during, and after inpatient hospitalization.

Sample size: Participants were 123 adolescent psychiatric inpatients who completed measures at hospital admission and discharge.

Methodology:

- The implicit measure (Self-Injury Implicit Association Test [SI-IAT]) and one of the explicit measures pertained to the NSSI method of cutting.
- Patients were interviewed at multiple time points at which they reported whether they had engaged in NSSI before their hospital stay, during their hospital stay, and within 3 months after discharge.

Findings:

- At baseline, SI-IAT scores differentiated past-year self-injurers and noninjurers.
- These SI-IAT effects were stronger among patients who engaged in cutting (versus noncutting NSSI methods).
- Controlling for NSSI history and prospective risk factors, SI-IAT scores predicted patients' subsequent cutting behavior during their hospital.
- Patients' explicit self-report uniquely predicted hospital-based and post discharge cutting, even after controlling for SI-IAT scores.
- Exploratory analyses revealed that in specific cases in which patients explicitly reported low likelihood of NSSI, SI-IAT scores still predicted hospital-based cutting.

Implications/Prevention Strategies:

- None.

Future research:

- The SI-IAT is an implicit measure that is outcome-specific, a short-term predictor above and beyond NSSI history, and potentially helpful for cases in which patients at risk for NSSI explicitly report that they would not do so in the future.
- Ultimately, both implicit and explicit measures can help to predict future incidents of cutting among adolescent inpatients.

Coughlin, B., & van Dam, K. (2015, August 25). *Bias in Battledress: Fixing the hidden problems of military prejudice*.

Purpose: This article addresses the biased past of the military to show the problems of the past and why bias is an important issue today to promote equality.

Sample size: None.

Methodology:

- Using a timeline format, the authors describe various scenarios within the military that are prominent examples of bias.

Findings:

- The military has constantly discriminated against nearly every then-minority group, but the times have changed and the military is making big attempts to fix the biases and reverse-biases that currently exist.

Implications/Prevention Strategies:

- The most prominent advice given by the authors is to emphasize task cohesion to set a firm line that any bigotry will not be tolerated.

Future research: None.

Cvencek, D., Greenwald, A. G., & Meltzoff, A. N. (2011, January 6). Measuring implicit attitudes of 4-year-olds: The Preschool Implicit Association Test. *Journal of Experimental Child Psychology, 109*, 187-200. Retrieved July 27, 2016, from Elsevier Inc.

Purpose: measuring social cognition of children through modified implicit association tests

Sample size:

- A total of 65 4-year-olds (M = 54.51 months, SD = 1.20, 32 girls and 33 boys) were recruited for this experiment by telephone from the university's participation pool.
- According to parental reports, all children were typically developing and the racial/ethnic makeup of the sample was 83.1% White, 3.1% Asian, 1.5% Native American, 7.7% multiracial (i.e., more than one race), and 4.6% other/unknown, with 7.7% reported to be of Hispanic ethnicity. Each family received $10 in exchange for participation.

Methodology:

- The PSIAT (Preschoolers' Implicit Association Test) and its use as an implicit measure. In adults, the IAT is a computerized double-categorization task that measures relative association strengths among concepts without self-report. In this experiment, the standard adult IAT was adapted for use with 4-year-olds.
- Modifications were similar to those in previous child IAT procedures, including an adapted keyboard and presentation of spoken words, but extended well beyond them to make the test suitable for preschoolers.
- Children were tested individually in a quiet room at the university and were told that they first would be ''asked some questions'' and then would ''play a game on a computer.''
- The explicit measure was administered as two bipolar scales using the same response format as in Harter and Pike's (1984) Pictorial Scale.
- For each scale, children were shown two composite images: one with four flowers and one with four insects.

- The experimenter explained each composite image while pointing to it (e.g., ''on the left we have some flowers'' and ''On the right we have some bugs''). For each scale, children were asked to report on a 4-point scale (a) which composite image they liked more (e.g., ''Do you like flowers more or do you like bugs more?'') and (b) the degree to which they liked the selected composite image (e.g., ''How much do you like flowers [bugs]? A little or a lot?'').
- The latter was done by children's pointing to one of two circles (1.1 and 2.3 cm in diameter corresponding to a little and a lot) assigned the values of 1 and 2.
- The responses from two questions were averaged to arrive at the explicit score with lower and upper bounds of _2 and +2; positive values indicated that children reported liking flowers more. The order of the two questions was counterbalanced across participants, as was the left–right assignment of flower and insect composite images. These self-report measures were not administered to 12 of the 65 participants because they had not been developed at testing.

Findings:
- The PSIAT was effective in evaluating (a) attitudes toward commonly liked objects (flowers = good) and (b) gender attitudes (girl = good or boy = good).
- The gender attitude PSIAT was positively correlated with corresponding explicit attitude measures and also children's actual sex.
- The new implicit and explicit measures of gender attitudes demonstrated discriminant validity; each predicted variance in children's gendered play activities beyond that predicted by the other.

Implications/Prevention Strategies:
- None.

Future research:
- The PSIAT could potentially be used to investigate development of societally significant attitudes and stereotypes at younger ages than are achievable with currently available methods.

de Jong, P. J., Sportel, B. E., de Hullu, E., & Nauta, M. H. (2012, March). Co-occurrence of social anxiety and depression symptoms in adolescence: Differential links with implicit and explicit self-esteem? *Psychological Medicine*, *42*(03), 475–484.

Purpose: to test whether the association between symptoms of social phobia and depression can be explained by low explicit self-esteem, whereas low implicit self-esteem is only involved in social anxiety.

Sample size: 1806 adolescents during the first stage of secondary education

Methodology:
- We used the IAT to assess implicit self-esteem. This test has already been applied successfully in similar age groups.
- Participants completed the Revised Child Anxiety and Depression Scale (RCADS) to measure symptoms of social anxiety and depression, the Rosenberg Self-Esteem Scale (RSES) to index explicit self-esteem and the Implicit Association Test (IAT) to measure implicit self-esteem.
- Target labels were 'me' and 'other'. Attribute labels were 'positive' and 'negative'.
- Each category consisted of five stimuli that were used in previous research among adolescents (Bos *et al.* 2010): the self-referent (me) words were 'I, my, myself, me, own'. The other-referent words were 'other, they, their, them, themselves'. The high esteem (positive) words were 'nice, smart, good, fun, friendly', and finally the low esteem (negative) words were 'stupid, bad, dumb, nasty, unfriendly'.

- Following a correct response, the next stimulus was presented after 500 ms. Following an incorrect response, a red cross appeared on the screen, and the stimulus remained on the screen until the correct response was given.
- The order of the category combinations was fixed across participants to reduce method variance, thereby enhancing the sensitivity of the IAT as a measure of individual differences.
- The RCADS is a 47-item self-report instrument using a four-point scale. The RCADS consists of several subscales. In this study we used the major depressive disorder (Cronbach's [alpha] =0.80) and social phobia (Cronbach's [alpha] =0.86) subscales RCADS-DD and RCADS-SP respectively.
- The RSES (Rosenberg, 1965) is a 15-item self-report with a five-point scale, assessing (explicit) self-esteem. The questionnaire has both positively formulated and negatively formulated items. The scores were recoded in such a way that high scores reflected high self-esteem. The psychometric properties of the Dutch RSES have been shown to be satisfactory (Franck *et al.* 2008). In this study, Cronbach's [alpha] was 0.89.
- The assessment was part of a screening process in the context of a large-scale study on the efficacy of two interventions designed to prevent social and test anxiety in adolescents.
- Participants were tested in the school environment in groups of a maximum of 15 participants. Participants always started with the IAT.

Findings:
- There was a strong association between symptoms of depression and social anxiety that could be largely explained by participants' explicit self-esteem.
- Only for girls did implicit self-esteem and the interaction between implicit and explicit self-esteem show small cumulative predictive validity for social anxiety, indicating that the association between low implicit self-esteem and social anxiety was most evident for girls with relatively low explicit self-esteem.
- Implicit self-esteem showed no significant predictive validity for depressive symptoms.

Implications/Prevention Strategies:
- The findings support the view that both shared and differential self-evaluative processes are involved in depression and social anxiety.

Future research: None.

Franklin, J. C., Lee, K. M., Puzia, M. E., & Prinstein, M. J. (2013). Recent and frequent nonsuicidal self-injury is associated with diminished implicit and explicit aversion toward self-cutting stimuli. *Clinical Psychological Science*.
Purpose: to test the hypothesis that an instinctive barrier to nonsuicidal self-injury (NSSI) –the aversion to self-cutting stimuli—is diminished in people who engage in NSSI.
Sample size: 86 noninjurers and 58 people with a history of self-cutting
Methodology:
- **Implicit Association tests were used with variables of cutting and not cutting.**
Findings:

- NSSI was associated with substantially reduced aversion to self-cutting stimuli across measures of both implicit and explicit affect even after controlling for emotion reactivity and dysregulation.
- This diminished aversion primarily applied to individuals who had engaged in NSSI within the past year or who had 10 or more lifetime episodes of self-cutting.
- Implicit identification with NSSI also significantly distinguished between groups but was not correlated with affective measures or NSSI recency or frequency.

Implications/Prevention Strategies:
- Although previous work has shown that the affective benefits of NSSI are natural and universal, these findings suggest that diminished instinctive barriers to NSSI may be specific NSSI risk factors that can be targeted in novel interventions.

Future research: None.

Green, A. R., Carney, D. R., Pallin, D. J., Ngo, L. H., Raymond, K. L., Iezzoni, L. I., & Banaji, M. R. (2007). Implicit bias among physicians and its prediction of Thrombolysis decisions for black and white patients. *J Gen Intern Med.*, *22*(9), 1231–1238.

Purpose: 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.

Sample size: Study invitations were e-mailed to all internal medicine and emergency medicine residents at four academic medical centers in Atlanta and Boston; 287 completed the study, met inclusion criteria, and were randomized to either a black or white vignette patient.

Methodology:
- An internet-based tool comprising a clinical vignette of a patient presenting to the emergency department with an acute coronary syndrome, followed by a questionnaire and three Implicit Association Tests (IATs).
- IAT scores (normal continuous variable) measuring physicians' *implicit* race preference and perceptions of cooperativeness.
- Physicians' attribution of symptoms to coronary artery disease for vignette patients with randomly assigned race, and their decisions about thrombolysis.
- Assessment of physicians' *explicit* racial biases was done by questionnaire.

Findings:
- Physicians reported no explicit preference for white versus black patients or differences in perceived cooperativeness.
- In contrast, IATs revealed implicit preference favoring white Americans and implicit stereotypes of black Americans as less cooperative with medical procedures, and less cooperative generally.
- As physicians' pro-White implicit bias increased, so did their likelihood of treating white patients and not treating black patients with thrombolysis.

Implications/Prevention Strategies:

- This study represents the first evidence of unconscious (implicit) race bias among physicians, its dissociation from conscious (explicit) bias, and its predictive validity.
- Results suggest that physicians' unconscious biases may contribute to racial/ethnic disparities in use of medical procedures such as thrombolysis for myocardial infarction.

Future research: None.

Haider, A. H., Sexton, J., Sriram, N., Cooper, L. A., Efron, D. T., Swoboda, S., Villegas, V., Haut, E.R., Bonds, M., Pronovost, P.J., Lipset, P.A., Freischlag, J.A., Cornwell, E. E. (2011, September 7). Association of unconscious race and social class bias with vignette-based clinical assessments by medical students. *Journal of the American Medical Association, 306*(9).

Purpose: To estimate unconscious race and social class bias among first-year medical students and investigate its relationship with assessments made during clinical vignettes.

Sample size: A secure Web-based survey was administered to 211 medical students entering classes at Johns Hopkins School of Medicine, Baltimore, Maryland, in August 2009 and August 2010.

Methodology:

- This was a cross-sectional study performed on 2 cohorts of first-year medical students entering the Johns Hopkins School of Medicine, Baltimore, Maryland. The medical school's institutional review board (IRB) and dean's office approved the study. During medical school orientation, students were invited to participate in a confidential, Web-based survey that remained online for 48 hours.
- Each survey included, in order of appearance: consent page; 8 clinical vignettes designed to assess clinical assessments and decisions; the race Implicit Association Test (IAT) that assesses unconscious preference for white persons vs black persons and a novel social class IAT that examines implicit preference for members of the upper class vs the lower class; direct questions regarding explicit race and social class preferences; and student demographics, including student sex, age group, and race/ethnicity.
- Participant race data were collected to control for an important factor that could affect results.
- 8 clinical assessment vignettes focused on pain assessment, informed consent, patient reliability, and patient trust. Adjusting for student demographics, multiple logistic regressions were used to determine whether responses to the vignettes were associated with unconscious race or social class preferences.
- Main outcome measures were association of scores on an established IAT for race and a novel IAT for social class with vignette responses.

Findings:

- Among the 202 students who completed the survey, IAT responses were consistent with an implicit preference toward white persons among 140 students (69%, 95% CI, 61%-75%).
- Responses were consistent with a preference toward those in the upper class among 174 students (86%, 95% CI, 80%-90%).
- Assessments generally did not vary by patient race or occupation, and multivariable analyses for all vignettes found no significant relationship between implicit biases and clinical assessments.

- Adjusted odds ratios for other vignettes ranged from 0.69 to 3.03 per unit change in IAT score, but none were statistically significant.
- Analysis stratified by vignette patient race or class status yielded similarly negative results.
- Tests for interactions between patient race or class status and student IAT D scores in predicting clinical assessments were not statistically significant.

Implications/Prevention Strategies:
- The majority of first-year medical students at a single school had IAT scores consistent with implicit preference for white persons and possibly for those in the upper class.
- However, overall vignette-based clinical assessments were not associated with patient race or occupation, and no association existed between implicit preferences and the assessments.

Future research:
- Further investigation of the association of implicit bias with clinical interactions and the ways in which such biases may be generated or reinforced during medical education and training may enable the design of interventions to address disparities in health care.

Harris, R., Cormack, D., Curtis, E., Jones, R., Stanley, J., & Lacey, C. (2016, July 11). Development and testing of study tools and methods to examine ethnic bias and clinical decision-making among medical students in New Zealand: The bias and decision-making in medicine (BDMM) study.

Purpose: To examine potential racial/ethnic bias among medical students and to measure their clinical decision making skills with aforementioned potential bias

Sample size: 18 final year medical students in New Zealand

Methodology:
- The study was developed, pretested and piloted using a staged process (eight stages within five phases).
- Phase 1 included three stages: 1) scoping and conceptual framework development; 2) literature review and identification of potential measures and items; and, 3) development and adaptation of study content.
- Three main components were identified to assess different aspects of racial/ethnic bias: (1) *implicit* racial/ethnic bias using NZ-specific Implicit Association Tests (IATs); (2) *explicit* racial/ethnic bias using direct questions; and, (3) clinical decision-making, using chronic disease vignettes.
- Phase 2 (stage 4) comprised expert review and refinement.
- Formal pretesting (Phase 3) included construct testing using sorting and rating tasks (stage 5) and cognitive interviewing (stage 6).
- Phase 4 (stage 7) involved content revision and building of the web-based study, followed by pilot testing in Phase 5 (stage 8).

Findings:
- Materials identified for potential inclusion performed well in construct testing among six participants.
- This assisted in the prioritization and selection of measures that worked best in the New Zealand context and aligned with constructs of interest.

- Findings from the cognitive interviewing (nine participants) on the clarity, meaning, and acceptability of measures led to changes in the final wording of items and ordering of questions.

Implications/Prevention Strategies:
- Robust processes are required in the development of study content to assess racial/ethnic bias in order to optimize the validity of specific measures, ensure acceptability and minimize potential problems.

Future research:
- This paper has utility for other researchers in this area by informing potential development approaches and identifying possible measurement tools.

Lee, K. and Kim, D. (2016, July). Explicit and implicit image cognitions toward destination: Application of the Single-Target Implicit Association Test (ST-IAT). *Journal of Destination Marketing & Management, 5*(3).

Purpose: to measure the image attributes of destinations using data based on theory drawn from tourism psychology.

Sample size: individuals in the context of three destination countries: China, England, and France.

Methodology:
- The Single-Target Implicit Association Test (ST-IAT) is utilized in the context of tourism.
- Destination image is measured using both explicit and implicit data.
- Based on self report surveys to convey explicit cognition and reaction times to convey implicit cognition

Findings:
- Explicit image cognitions are found to be inconsistent with implicit image cognitions.
- Ranking orders of image attributes using weights are suggested.
- Weight values act as a predictor of behavioral intention.
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Implications/Prevention Strategies:
- The findings imply that knowing the weight values between explicit image measures and the ST-IAT is imperative in predicting behavioral intentions in tourism.

Future research: None.

Lee, K. (2013). *A study of explicit and implicit cognitions towards image attributes of destination country: Application of the single-target implicit association test (the ST-IAT).*

Purpose: The study attempts to assess people's explicit and implicit cognitions toward the image attributes of a destination country by using a psychological method.

Sample size: 285 college students, Study 1 (N=85), Study 2 (N=100), and Study 3 (N=100), respectively, were recruited from a University in a Midwest region of the U.S. to serve as participants.

Methodology:
- A self-report survey and the Single-Target Implicit Association Test (ST-IAT) were used.

Findings:
- The primary finding of this study shows that individuals' explicit cognitions towards the image attributes of a destination country are inconsistent with their implicit image cognitions in terms of some image attributes.

- The study also finds that respondents' explicit and implicit image cognitions are correlated in Study 1 and Study 2 but not in Study 3.

Implications/Prevention Strategies:

The two image cognitions should be the antecedents of behavioral intention in the domain of destination country.

Future research: None.

Lindgren, Kristen P., Neighbors, C., Teachman, B.A., Wiers, R.W., Westgate, E., Greenwald, A.G. (2013, March). I drink therefore I am: Validating alcohol-related implicit association tests. *Psychology of Addictive Behaviors,* 27(1), 1-13.

Purpose: The current study examined five alcohol-related variants of the Implicit Association Test (IAT) and sought to establish their predictive validity.

Sample size: 300 undergraduates

Methodology:

- Implicit Association Tests using alcohol-related variables and non-alcohol-related variables when self-identifying

Findings:

- Results indicated that the Drinking Identity IAT, which measured associations of "drinker" with "me," was the most consistent predictor of alcohol consumption, alcohol problems, and alcohol cravings.
- It also had the highest internal consistency and test–retest reliability scores.
- The results for the Alcohol Excitement and Alcohol Approach IATs were also promising, but their psychometric properties were less consistent.
- Although the two IATs were positively correlated with all of the drinking outcome variables, they did not consistently predict unique variance in those variables after controlling for explicit measures.
- They also had relatively lower internal consistencies and test–retest reliabilities.

Implications/Prevention Strategies:

- Implicit drinking identity may be a useful tool for predicting alcohol consumption, problems, and cravings and a potential target for prevention and intervention efforts.

Future research: None.

Livaudais, J. C., Hershman, D. L., Habel, L., Kushi, L., Gomez, S. L., Li, C., Neugut, A.I., Ferenbacher, L.,Thompson, B., Coronado, G.D. (2011). Racial/ethnic differences in initiation of adjuvant hormonal therapy among women with hormone receptor-positive breast cancer. *Breast Cancer Res Treat.*, *131*(2).

Purpose: to explore racial/ethnic differences in initiation of adjuvant hormonal therapy, defined as 2 or more prescriptions for tamoxifen or aromatase inhibitor filled within the first year after diagnosis of hormone receptor-positive localized or regional stage breast cancer.

Sample size: The sample included women diagnosed with breast cancer enrolled in Kaiser Permanente Northern California (KPNC).

Methodology:
- For each woman, prescriptions for tamoxifen, anastrazole, exemestane, and letrozole within the first year after diagnosis were reviewed, and women with at least two documented prescriptions that were filled for any of these medications within this time period were considered to have initiated adjuvant hormonal therapy.
- Odds ratios [OR] and 95% confidence intervals [CI] compared initiation by race/ethnicity (Hispanic, African American, Chinese, Japanese, Filipino, and South Asian vs. non-Hispanic White (NHW)) using logistic regression.
- Covariates included age and year of diagnosis, area-level socioeconomic status, co-morbidities, tumor stage, histology, grade, breast cancer surgery, radiation and chemotherapy use.

Findings:
- Our sample included 13,753 women aged 20–79 years, diagnosed between 1996 and 2007, and 70% initiated adjuvant hormonal therapy.
- In multivariable analysis, Hispanic and Chinese women were less likely than NHW women to initiate adjuvant hormonal therapy ([OR] =0.82; [CI] 0.71–0.96 and [OR] =0.78; [CI] 0.63–0.98; respectively).

Implications/Prevention Strategies:
- Within an equal access, insured population, lower levels of initiation of adjuvant hormonal therapy were found for Hispanic and Chinese women.

Future research:
- Findings need to be confirmed in other populations and the reasons for under-initiation among these groups need to be explored.

Oliver, M. N., MD,MA, Wells, K. M., MPH, PhD, Joy-Gaba, J. A., PhD, Hawkins, C. B., MA, & Nosek, B. A., PhD. (2014, April). Do physicians' implicit views of African Americans affect clinical decision making? *Journal of the American Board of Family Medicine.*

Purpose: to evaluate whether the magnitude of implicit racial bias predicts physician recommendation of total knee replacement (TKR) for black and white patients with osteoarthritis (OA) and to assess the effectiveness of a web-based instrument as an intervention to decrease the effect of implicit racial bias on physician recommendation of TKR.

Sample size: 543 family and internal medicine physicians

Methodology:
- In this web-based study, the physicians were given a scenario describing either a black or white patient with severe OA refractory to medical treatment.
- Questionnaires evaluating the likelihood of recommending TKR, perceived medical cooperativeness, and measures of implicit racial bias were administered.
- The main outcome measures included TKR recommendation, implicit racial preference, and medical cooperativeness stereotypes measured with implicit association tests.

Findings:
- Subjects 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 TKR when the patient was black (47%) versus white (38%), and neither implicit nor explicit racial biases predicted differential treatment recommendations by race.
- Although participants were more likely to recommend TKR when completing the implicit association test before the decision, patient race was not significant in the association.

Implications/Prevention Strategies:
- Physicians possessed explicit and implicit racial biases, but those biases did not predict treatment recommendations.
- Clinicians' biases about the medical cooperativeness of blacks versus whites, however, may have influenced treatment decisions.

Future research: None.

Pavlović, M., & Purić, D. (2016). Basic personality traits as correlates of implicit prejudice. *Applied Psychology, 9*(2), 125-140. Retrieved July 27, 2016.

Purpose: This study explores the relationship between "Big Five" personality dimensions and implicit prejudice towards two groups: (1) homosexuals and (2) elderly people.

Sample size: Two separate samples of 84 psychology students who agreed to participate in the research in exchange for course credit were used in each study. The mean age of participants was 20 years ($SD = 0.64$) and 12 percent were males.

Methodology:
- The NEO PI-R personality inventory to register basic personality dimensions, the Implicit Association Test (IAT) to measure implicit prejudice, and a semantic differential and the Fraboni scale to assess explicit prejudice was all used.

Findings:
- Results of the correlation and multiple regression analyses indicated that implicit prejudice toward homosexuals was related to Openness to Experience, while implicit ageism was related to Agreeableness.

- More precisely, people who obtained lower scores on these personality dimensions were more likely to hold implicit prejudice towards members of these stigmatized groups.
- The relationship between personality and implicit prejudice could not be reduced to the relationship of personality traits with the explicit measures of prejudice.

Implications/Prevention Strategies:

- There is a theoretical distinction between implicit and explicit prejudice constructs.

Future research:

- The relationship between personality traits and implicit bias.

Sabin, J. A., & Greenwald, A. G. (2012). The influence of implicit bias on treatment recommendations for 4 common pediatric conditions: Pain, urinary tract infection, attention deficit Hyperactivity disorder, and asthma. *American Journal of Public Health*, *102*(5), 988–995.

Purpose: The association between pediatricians' attitudes about race and treatment recommendations by patient's race was examined.

Sample size: 86 pediatricians

Methodology:

- An online survey was used.
- 3 Implicit Association Tests were used to measure implicit attitudes and stereotypes about race.
- Dependent variables were recommendations for pain management, urinary tract infections, attention deficit hyperactivity disorder, and asthma, measured by case vignettes.
- Correlational analysis was used to assess associations among measures and hierarchical multiple regression to measure the interactive effect of the attitude measures and patients' race on treatment recommendations.

Findings:

- Pediatricians' implicit 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.

Implications/Prevention Strategies:

- Pediatricians' implicit attitudes about race affect pain management.
- There is a need to better understand the influence of physicians' unconscious beliefs about race on pain and other areas of care.

Future research: None.

Seck, H. H. (2016, March 18). *All marines to get 'unconscious bias' training as women join infantry*.

Purpose: This article discusses the change in the Marines' policy, allowing women into combat roles as well as introducing bias-training.

Sample size: None.

Methodology:

- The article discusses the purposes for the change and the logic behind it.
- Additionally the article discusses the history of bias in the military and the format of training that the Marines will have to go through in order to prevent future bias.

Findings:

- None.

Implications/Prevention Strategies:

- A non-biased military could lead to a more gender-equal future.

Future research: None.

Stevens, C. (2016, July 20). Applying a single category implicit association test methodology to organ donation attitudes – Assessing the gap between implicit and explicit beliefs. *Manchester Metropolitan University.*

Purpose: to see where attitude and behavior are not congruent in regards to organ donation

Sample size: 94 participants

Methodology:

- **The Single Category Implicit Association Test (SC-IAT) was used.**
- An SC-IAT was conducted alongside a questionnaire so that implicit and explicit attitudes could be assessed.
- In line with previous research, questionnaire responses indicated high levels of positive attitudes towards organ donation across the entire sample.

Findings:

- SC-IAT scores indicated a variety of implicit attitudes ranging from negative associations to organ donation (shown by participants being quicker at pairing organ donation images with words of a negative valence), to positive associations (shown by participants being quicker at pairing organ donation images with words of a positive valence).
- People whose SC-IAT scores were in the upper third (i.e. positive), also reported strong positive explicit attitudes and were more likely to be organ donors.
- People whose SC-IAT scores were in the lower third (i.e. negative) also had positive explicit attitudes. However their positive attitudes were less strong than those of the former group and they were less likely to be organ donors.

Implications/Prevention Strategies:

- Having a skewed perspective of organ donation directly impacts the action of organ donation.
- As a result, people's reported high attitudes of organ donation do not actually correlate to their implicit beliefs.
- If people have a belief that does not correlate to their actions, organ donation rates will be impacted.

Future research: None.

Waller, T., Lampman, C., & Lupfer-Johnson, G. (2012, September 17). Assessing bias against overweight individuals among nursing and psychology students: An implicit association test. *Journal of Clinical Nursing, 21*(23-24), 3504-3512.

Purpose: To determine the implicit or unconscious attitudes of Nursing and Psychology majors towards overweight individuals in medical and non-medical contexts.

Sample size: A total of 90 students from Nursing and Psychology, 45 from each subject.

Methodology:
- A mixed design experiment with one between-subjects variable (student major: Nursing or Psychology) and one within-subjects variable (condition: congruent or incongruent) was used to assess implicit attitudes in two convenience samples of Nursing and Psychology students.
- A computerized implicit association test was used to determine implicit attitudes towards overweight individuals in medical and non-medical contexts.
- Reaction times in milliseconds between the congruent trials (stereotype consistent) and incongruent trials (stereotype inconsistent) were compared with determine adherence to social stereotypes or weight bias.

Findings:
- A statistically significant implicit bias towards overweight individuals was detected in both subject groups and in both target settings (medical vs. non-medical).
- Stronger weight bias was found when the stimulus targets were female than male.

Implications/Prevention Strategies:
- Findings from this study expand understanding of the implicit attitudes and social biases of Nursing and Psychology students.
- The views held by these future healthcare professionals may negatively impact patient care.
- Therefore, nurses and other healthcare professionals must be aware of personal biases and work to develop methods to address weight-related issues in a therapeutic manner.

Future research: None.

Young, K. C., Kashdan, T. B., & Macatee, R. (2014). Strength balance and implicit strength measurement: New considerations for research on strengths of character. *The Journal of Positive Psychology*, *10*(1), 17–24.

Purpose: to see whether strength balance (i.e. jack of all strengths) impacts well-being beyond mastering signature strengths

Sample size: 140 adults

Methodology:
- A multivariate regression with signature strengths and strength balance was conducted.
- Variables looked at **were** life satisfaction and psychological need (relatedness, competency, and autonomy) satisfaction.

- We also developed a novel, strength-based implicit association test (IAT) to complement explicit measurement.

Findings:

- **Results found that** signature strengths and strength balance uniquely predicted greater well-being.

Implications/Prevention Strategies:

- Though the IAT possessed poor internal consistency, it provides valuable information regarding the design of future implicit measures of character strengths.

Future research:

- Strength balance and implicit strength measurement may offer new opportunities to further understanding of personality and well-being.