

The Prevalence of Implicit Bias in Practicing Physical Therapists

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Background: Implicit biases (IB) are unconscious or automatic attitudes and stereotypes that all people hold towards individuals or groups based on social group membership, categories, or traits. While implicit biases are unconscious or automatic, one is by definition more aware and conscious of their explicit biases. In the healthcare setting, implicit biases can and do impact perceptions, interactions, and clinical decision-making involving patients. Most research regarding the prevalence of implicit bias in healthcare, to date, focuses on physicians and nurses, but no evidence exists regarding implicit bias prevalence in physical therapists (PTs). Our objectives were to determine the difference, if any, between levels of race- and disability-related implicit biases using Implicit Association Test (IAT) score comparisons between PTs practicing in orthopedic and pediatric settings.

Methods: A total of 59 licensed orthopedic and pediatric PTs completed the IAT race and disability subtests, self-reported levels of explicit racial and disability biases, and demographic characteristics.

Results: On average, participants reported slight levels of IB favoring White over Black people despite reports of neutral explicit bias (EB). Similarly, participants reported moderate levels of IB favoring individuals without disabilities over those with disabilities despite reports of only neutral to slight EB on average. PTs practicing in pediatric settings reported significantly higher levels of race-related IB than those practicing in orthopedic settings (Wilcoxon $S=623.5$, $p=0.014$), but there was no significant difference between the levels of disability-related IB based on practice setting (Wilcoxon $S=850$, $p=0.245$).

Conclusions: This sample of PTs demonstrated rates of IB on the basis of race or disability status similar to other healthcare providers and the general population. Furthermore, participants generally rated their EBs towards racial minorities and individuals with disabilities more favorably than IAT test results indicated. The disconnect between IBs and EBs was confirmed in our study and highlights the continued need for IB awareness and subsequent bias reduction interventions for healthcare providers given the negative consequences.

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BACKGROUND

Implicit biases reflect unconscious attitudes or stereotypes towards an individual or group of individuals based on social group membership, categories, and traits.¹ Implicit attitudes or stereotypes and subsequent biases may be either positive or negative and can unconsciously impact one's actions and decision-making processes.²

These unconscious biases are more readily activated when people are either busy, distracted, tired or under pressure because they are processing with less cognitive effort.³ Conversely, explicit biases reflect attitudes or stereotypes that exist within a realm of conscious awareness and processing.³

While these mental shortcuts are efficient and, at times beneficial, implicit biases have the potential to negatively impact patients in the healthcare system who experience increased vulnerability given their state of illness or injury.^{3,4} Nearly all

available research about implicit bias in healthcare focuses on physicians and nurses, revealing low to moderate levels of implicit bias toward racial/ethnic minorities and individuals with disabilities – rates that are consistent with that of the general population.^{3,4} This bias even extends to providers that treat children based on a study of pediatric orthopedic surgeons who demonstrated strong levels of pro-White bias.⁵

In healthcare, implicit biases can worsen patient-provider interactions including patient-provider communication and the patient's perception of whether they receive patient-centered, collaborative care.^{3,4,6} Providers' clinical decision-making with regard to clinical interventions can also be affected by biases, as is evidenced by differing plans of care and regimens for White and non-White patients.^{3,4,6} As a result, patient adherence to treatment, availability for follow up, and health outcomes are worse for non-White patients as compared to White patients.^{3,4,6} This sequence is potentially dangerous for perpetuating health disparities among already marginalized groups during vulnerable periods of illness, injury and rehabilitation.⁴

While research about the prevalence of implicit biases in healthcare exists, there are no published studies exploring implicit biases among practicing physical therapists (PTs). PTs work in a variety of settings, ranging from hospitals to outpatient clinics to patients' homes, where they may encounter a variety of different backgrounds and abilities. Additionally, the PT's ability to establish a trusting relationship with the patient is of particular importance, when compared with other practitioners, because PT treatment frequencies are usually much higher (e.g. 1-3x/week over 12 weeks) than primary care visit frequencies (e.g., as needed, bi-annually). Successful outcomes are contingent upon adherence to the PT plan of care. Therefore, it is critical that PTs become aware of any implicit biases they may hold that negatively impact patient care. Awareness is a prerequisite to reflection and the potential to mitigate or change thoughts and behaviors that influence patient

outcomes.

The two main objectives of this study are: 1) to determine the prevalence of race- and disability-related bias in a small cohort of PT clinical instructors, and 2) to determine if there is any difference between the level of implicit bias of these PTs in two different practice settings – outpatient orthopedic and pediatric. We hypothesized that no differences would be observed between race-related implicit biases between orthopedic and pediatric PTs similar to Guzek et al.'s research⁵, but we would observe differences in disability-related implicit bias based on practice setting – with pediatric PTs having lower levels of bias towards individuals with disability than orthopedic PTs. This hypothesis is based on the idea that pediatric PTs treat patients with chronic disability at a greater rate than orthopedic PTs.⁷

METHODS

This was a cross-sectional study conducted at the University of North Carolina at Chapel Hill (UNC-CH) in the Division of Physical Therapy. The study was approved by the UNC-CH Institutional Review Board and fulfilled the Capstone project requirements for two Doctor of Physical Therapy (DPT) students under the supervision of three faculty members in the Department of Health Sciences.

Participants

Licensed PTs were recruited via email from a UNC database of 90 past clinical instructors from the previous year (2017) who practice in either outpatient orthopedic or pediatric clinical settings. The Division primarily has clinical affiliations in North Carolina, however, PTs who received the email were able and asked to forward the correspondence to any colleagues in the identified practice settings of interest (orthopedic or pediatric) regardless of location in order to potentially increase the number of participants. PTs who completed the survey were offered

one-year free access to the UNC-CH Health Sciences Library online journal database. The faculty member who collected participant email addresses to provide journal subscriptions did not have access to the survey responses in order to maintain confidentiality of participant responses. All participants provided informed consent and demographic information through a secure Qualtrics survey link. A total of 59 PT participants responded to the survey. Of these participants, 33 (56%) were in outpatient orthopedic practice and 26 (44%) were in pediatric practice. Participants averaged 11.09 years (SD=10.09 years) of experience as PTs and 8.08 years (SD=7.41 years) in their current practice settings with pediatric PTs having more experience than those in orthopedics (mean= 10.69 years versus 6.03 years). Participants primarily practiced in North Carolina (79.7%), and the remainder practiced in locations out of state. Participants were asked to categorize their current work location as either urban (42.6%), suburban (34%), or rural (23.4%) based on the county in which they practice in accordance with the North Carolina Rural Center criteria.⁸ Work location in addition to other demographic information (age range, gender identity, race, ethnicity, and disability status) were optionally reported by participants. Participant demographics are summarized in **Table 1**.

The Implicit Association Test

The Implicit Association Test (IAT) was developed by Greenwald, McGhee, and Schwartz in 1998 to measure implicit cognition and, consequently, implicit bias.⁹ The IAT is a computer-based test that presents two concepts: one image (target) to which the test taker must associate one of two words (stereotypical attribute).⁹ Reaction times for pairing concepts (target-stereotypical attribute) are measured under the premise that faster reaction times reflect readily accepted automatic associations while slower reaction times suggest that inhibitory cognitive processes are occurring to override automatic associations that may be considered unfavorable.⁹ The measured association between the paired concepts, such

as race or disability, with images and words is then used to determine the subject's implicit preference for or against pairings.⁹ Scores are reported as either strong, moderate, slight, or neutral automatic preferences for one group over another (e.g., "a moderate automatic preference for White people over Black people" or "little to no automatic preference between abled and disabled people"). The IAT has been demonstrated validity and withstands effects of intentional manipulation.¹⁰ Little or no correlation has been established with measures of explicit biases or attitudes including racism or ableism.¹¹ Population data is gathered anonymously from IAT test takers on the publicly available ProjectImplicit website.¹²

Data Collection

The research team provided links to the appropriate IAT subtests and survey via direct email. A reminder email was sent approximately four weeks following initial contact. Participants were asked to complete the race and disability subtests of the IAT online and then report their IAT results, self-described explicit biases, and demographic characteristics via the Qualtrics survey link provided. The questions asked regarding explicit biases were "What do you consider your preference based on RACE to be?" and "What do you consider your preference based on DISABILITY to be?". The answer choices provided were identical to the categories that the IAT uses to classify individuals based on their test results – strong, medium, or slight preference for one group over the other (White/Black or Abled persons/Disabled persons) as well as neutral or no preference.

Statistical Analysis

Self-reported Implicit Association Test (IAT) scores were utilized to measure the levels of implicit bias among PTs regarding race and disability with corresponding subtests. We collected descriptive statistics on prevalence of bias in our sample. We examined differences in implicit bias between PTs currently practicing in orthopedic and pediatric settings and measured associations between the self-reported IAT scores and self-reported participant demographics for PTs from

Table 1. Demographic characteristics of participants

	Pediatrics (n=26)	Orthopedics (n=33)	Total (n=59)
Race			
White	30	24	54
Non-White	3	–	3
Prefer not to answer	–	2	2
Gender			
Female	23	23	46
Male	10	2	12
Prefer not to answer	–	1	1
Experience in years (median, IQR)			
Current practice setting	9, 11	3, 7	5, 10
Total	15.5, 18	4, 6.5	7, 14
Current Practice Location			
North Carolina	47	11	1
Out-of-state			
Prefer not to answer			
State Geographical Practice Location			
Urban	20	16	11
Suburban			
Rural			

orthopedic and pediatric practice settings. JMP (version 16.0) was used for statistical analysis. Descriptive statistics were used to characterize the demographics of participants. The Wilcoxon Rank Sum and Fisher's Exact Tests were used to compare characteristics and IAT scores of PTs in the orthopedic and pediatric settings. A p value of <.05 was considered statistically significant.

RESULTS

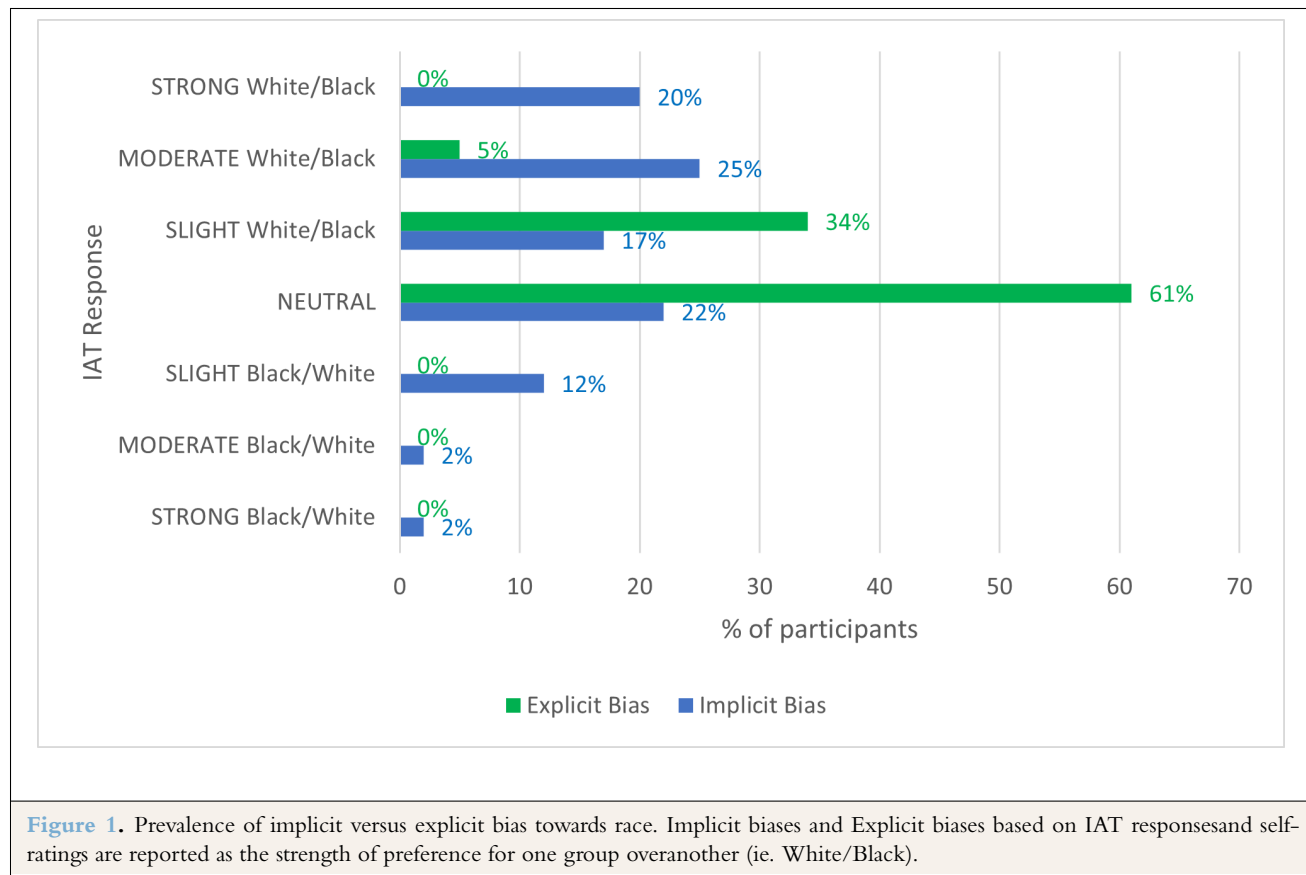
Sixty-two percent of the study participants reported IAT scores favoring White people over Black people and 84% reported scores favoring individuals without disabilities over those with disabilities. Preferences for White people over Black people were reported as strong (20%), moderate (25%), and slight (17%) compared to 22% of participants reporting neutral/no preference and 16% reporting any degree of favoring Black people over White people.

Regarding disability, 54% of participants reported IAT scores with strong automatic preferences for abled people over disabled people. Participants with moderate and slight preferences for abled

people accounted for 30% (15% each). Neutral preference was reported for 8% of participants and preferences for disabled people over abled people accounted for 7%.

Reported explicit biases did not directly align with implicit scores. Respondents reported neutral preferences for race (61%) and disability (44%). In fact, respondents reported similar levels of implicit bias as other healthcare providers and the general population with general preference for individuals who are White and without disabilities.^{3,4,6,11,12}

When comparing cohorts of PTs from different practice settings, PTs practicing in pediatric settings reported significantly higher levels of race-related implicit bias than those practicing in orthopedic settings (Wilcoxon $S = 623.5$, $p = 0.014$). However, there was no significant difference between the levels of disability-related implicit bias based on practice setting (Wilcoxon $S = 850$, $p = 0.245$). The small overall number of participants as well as the low number of under-represented minority participants in our study did not provide enough data to produce adequate power to reliably discuss any statistically significant associations regarding participant demographics. Participant responses are summarized in **Figures**



1 and 2.

Implicit biases and Explicit biases based on IAT responses and self-ratings are reported as the strength of preference for one group over another (ie. White/Black).

Prevalence of implicit versus explicit biases towards disability

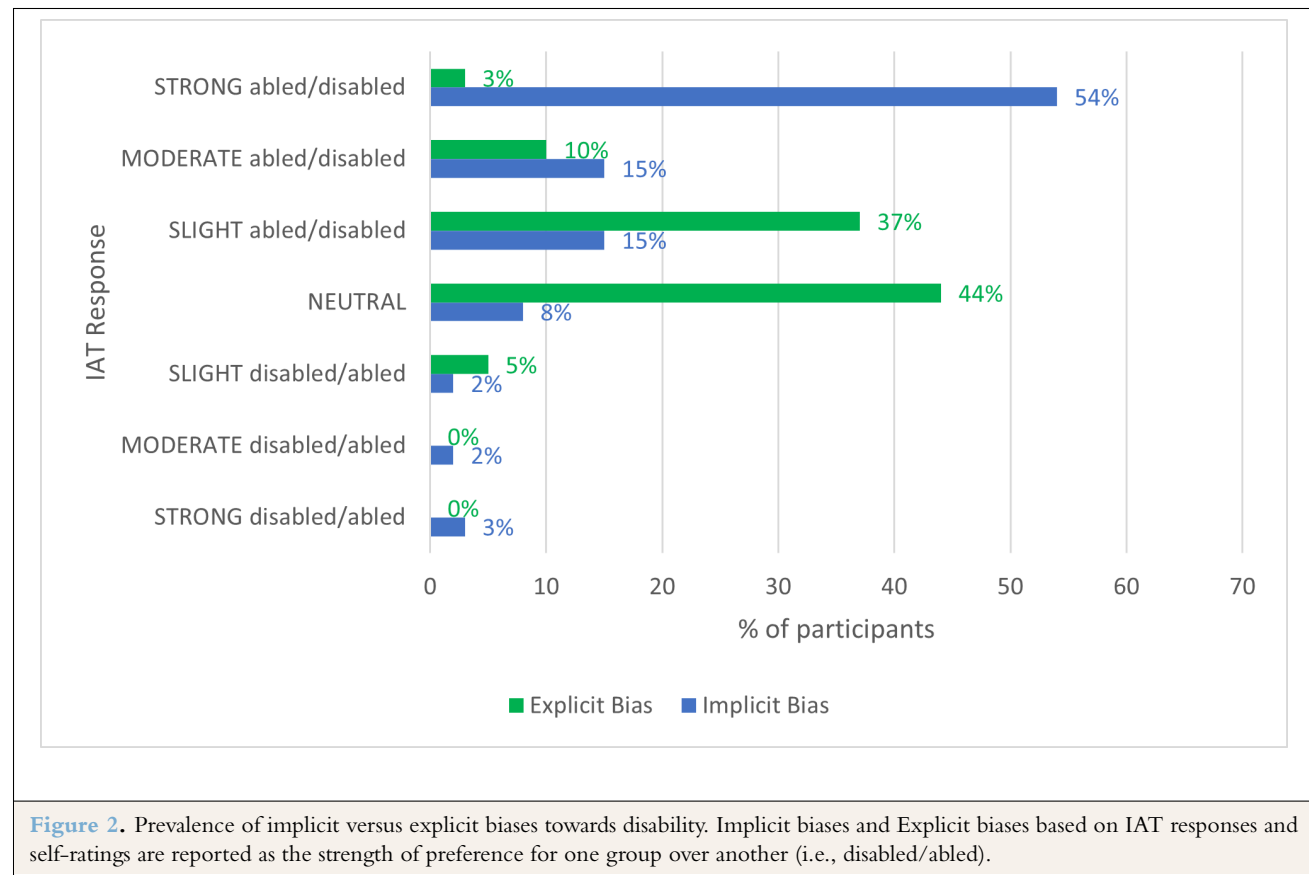
Implicit biases and Explicit biases based on IAT responses and self-ratings are reported as the strength of preference for one group over another (ie. Disabled/abled).

DISCUSSION

This sample of PTs demonstrated rates of implicit bias based on race or disability status similar to other healthcare providers and the general population.^{3,4,6,11,12} There is no significant distinction; the majority of physical therapists, other

healthcare providers, and the general population prefer White people over Black people and individuals without disabilities over those with disability.^{3,4,6,11,12}

Low to moderate levels of anti-Black bias among our study participants and other healthcare professionals are consistent with those documented in the general population in the United States where White Americans are more likely to have negative attitudes towards Black Americans including feelings of fear and distrust.³ However, 2 participants in our study identified as Black and were among only 9 total to report some level preference for Black people over White people, as assessed by the IAT. It is important to note that no participants, White or non-White, reported explicit preferences for Black people over White people. These results are consistent with previous evidence outlining bias of Black individuals towards other Black individuals¹³ as



well as evidence in support of “like bias.”¹⁴ Like bias, homophily, or in-group preference,¹⁵ begins in infancy, may be explicit or implicit, and continues to influence adults and their social interactions across the lifespan.¹⁴

Over half of our study participants reported a strong automatic preference for abled people over disabled people based on IAT testing. Like race, this is consistent with existing research documenting moderate to strong levels of bias held by healthcare providers and the general population against individuals with both physical and/or intellectual disabilities.^{16,17} Dionne et al.¹⁶ suggest a further stratification of individuals with physical disabilities wherein able-bodied study participants implicitly regarded individuals who are more physically active more positively than those who are not. This “exerciser stereotype” impacts explicit and implicit beliefs similarly.¹⁸ No PT-specific research exists regarding the exerciser

stereotype, but it calls into question whether the quality of patient care provided by rehabilitation professionals is impacted by a patient’s perceived physical ability status.

Robey et al.¹⁹ found that people are more likely to attribute child-like rather than adult-like qualities to individuals with disabilities. Some studies suggest that increased exposure to individuals with disabilities can have a positive effect on mitigating these biases.¹⁷ For example, school children in inclusive classroom settings where at least one classmate has a disability have more positive implicit ratings over time with increasing contact than children in non-inclusive classrooms.¹⁷ Other studies suggests that the quality rather than the quantity of contact with individuals with disabilities is more important to positively impact held attitudes and beliefs towards disabled persons.²⁰ Based on this evidence, improving the quality of contact, interactions, and relationships

with individuals with disabilities should be an integral part of physical therapy education and training in order to further mitigate the impact of negative implicit biases as physical therapy students transition to becoming practicing clinicians.

While there was no statistically significant difference in disability-related implicit bias based on practice setting, pediatric therapists reported significantly higher levels of race-related implicit bias than those practicing in orthopedic settings. One potential explanation for this finding is that the IAT uses images of adults, not children, for bias testing, which may not provide appropriate context for pediatric therapists. Therefore, race-related biases held by pediatric PTs may have potentially been influenced by interactions with adult parents or guardians of the children they treat. Because the parent plays an integral role in therapy adherence and management, we must consider how the context of practice, collaboration, and intensity of time spent with the family play a role in these results.

While the research regarding race-related implicit bias in pediatric PTs is sparse, there is evidence regarding these biases and how they impact the care decisions of pediatricians as well as evaluation and reporting of physical abuse to Child Protective Services (CPS). In their study of resident physicians in a large pediatric emergency department, Johnson et al.²¹ utilized two different race IAT tests, one showing images of children and the other of adults. These physicians demonstrated similar levels of implicit bias against Black children and adults. This bias did not vary by resident demographics.²¹ Additionally, in Guzek et al.'s study, pediatric orthopedic surgeons still demonstrated strong levels of pro-White bias even when the IAT used images of children rather than adults.⁵ These studies may provide a more appropriate context for healthcare providers serving the pediatric population, and therefore, further research regarding implicit bias in pediatric PTs may benefit from the use of the race IAT with child images.

As mentioned previously the implications of

race-related implicit bias can be a detriment to the quality of patient care and outcomes. In their 2012 study, Sabin and Greenwald²² investigated the associations between race-related attitudes of pediatricians and their treatment recommendations for children with asthma, pain, urinary tract infection, and attention deficit hyperactivity disorder. They found that as pro-White implicit bias increased, pain management recommendations included fewer postoperative narcotic medications for Black patients.²² An additional difference in the care decisions of physicians serving the pediatric population was found in the rate of reporting potential physical abuse to Child Protective Services (CPS) when fractures were present. Children of color at least one year old with accidental trauma were found to be more than three times more likely than White peers to be reported to CPS for potential abuse.²³ In this instance, the implicit bias may be to the detriment of both White and non-White children. While non-White children are removed from their families unnecessarily at a higher rate than White children based on the discrepancy of reporting, White children may be more often left in physically abusive households. This highlights the complexity of the consequences of implicit biases and the imperative need to address them to improve the quality of patient care and outcomes.

Limitations

While the IAT is currently considered the gold standard for assessing implicit biases in social constructs, it only captures biases as it relates to static images on a screen. Research tells us that individual biases may fluctuate based on situations and circumstances.² Other personal factors that may potentially influence IAT scores include cognitive fluency and generally slow reaction times.^{24,25} Additionally, we relied solely on each participant's self-reported IAT scores as there was no direct, anonymous reporting available to our

research team. The Hawthorne effect, defined as “consequent awareness of being studied, and possible impact on behavior,” may have potentially influenced participants as they took the IAT and/or when reporting via survey.^{25,26}

While we did find significant differences between our cohorts for race-related IAT scores (orthopedic versus pediatric PTs), the overall number of participants in our study did not provide enough data to produce adequate power to detect other possible underlying differences in demographic data. It is possible that the subject matter itself, which some may consider to be taboo or uncomfortable, deterred participation. Additionally, the diversity of our participants reflected the current demographic make up of the PT profession. According to the American Physical Therapy Association’s 2020 Workforce Analysis report, the field of physical therapy is 65% female and 84.3% White, limiting the availability of a diverse pool of participants for this study.²⁷

Future Directions for Research

Future studies should include larger cohorts of PTs and should use software that anonymously and automatically records IAT responses to reduce self-report reliability concerns. Further, future studies should evaluate implicit bias prevalence for additional populations including gender, age, and immigrant bias. In addition to racial minorities and individuals with disabilities, the Institute of Medicine has also identified other subgroups of the United States population at risk of receiving suboptimal healthcare including those identifying as non-heterosexual and/or non-cisgender, individuals/families with low-income, the elderly, women and girls, obese individuals, refugees, and immigrants.²⁰

Participants in our study generally rated their explicit biases towards racial minorities and individuals with disabilities more favorably than what implicit bias test scores revealed. This disconnect, often referred to as “cognitive dissonance,” between implicit and explicit biases is well-established¹¹ and highlights the continued need to identify effective implicit bias awareness and bias

reduction interventions for healthcare providers; however, we do not currently understand how implicit bias impacts PT practice specifically. Given the clear presence of bias in healthcare professionals, practical strategies are needed to alleviate and/or mitigate any negative impacts of biases on patient evaluations, interventions, and health outcomes.

Clinically, administrators should foster an environment conducive to reflection on implicit racial, ethnic, and class-based biases and their potential impact on patient care interactions. Like many other healthcare professions, the PT workforce does not reflect the diversity of the population it serves. Currently, Hispanics and non-Hispanic Blacks account for less than 10% of practicing PTs,²⁸ but make up nearly 25% of the US population.²⁹ Recognizing that white, able-bodied clinicians provide the majority of PT intervention, these therapists must take responsibility for acknowledging, understanding, and learning to mitigate any personal biases.³⁰ Institutions can take steps towards creating an inclusive environment by implementing diversity, equity, and inclusion trainings and prioritizing the employment and training of people of color as well as individuals with disabilities.

CONCLUSION

This pilot study demonstrates implicit bias levels in PTs similar to that of other healthcare providers and the general population.^{11,12} In the available evidence involving physicians and nurses, low to moderate levels of bias are shown to impact patients’ experiences in the healthcare system ranging from providers’ clinical decision-making to health outcomes.^{3,4,6} In this sample of practicing PTs, higher levels of racial bias with implicit preference for White over Black people were observed in orthopedic PTs than in pediatric PTs. Further research is indicated to explore factors contributing to this bias. Future studies should

place a primary focus on procuring a larger, representative sample of participants to explore more practice settings and greater geographic areas to more accurately describe the implicit bias of PTs practicing in the United States. Additional studies are warranted to address specific ways

implicit bias impacts PT evaluation, intervention and plans of care. It is paramount for our profession to identify effective strategies to address bias in practice to mitigate or prevent potentially harmful or suboptimal outcomes for non-White and/or patients with disability.

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REFERENCES

- Greenwald AG, Krieger LH. Implicit Bias: Scientific Foundations. *California Law Review*. 2006;94:945–967.
- Staats C, Capatosto K, Wright R, et al.. State of the science: Implicit bias review ; 2016,. <http://kirwaninstitute.osu.edu/wp-content/uploads/2016/07/implicit-bias-2016.pdf>
- Hall W, Chapman M, Lee K. Implicit Racial/Ethnic Bias Among Health Care Professionals and Its Influence on Health Care Outcomes: A Systematic Review. *AM J Public Health*. 2015;105:60–76.
- Fitzgerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review. *BMC Medical Ethics*. 2017;18.
- Guzek R, Goodbody CM, Jia L. Implicit Racial Bias in Pediatric Orthopaedic Surgery. *J Pediatr Orthop*. 2022;42(7):393–399.
- Maina IW, Belton TD, Ginzberg S, et al. A decade of studying implicit racial/ethnic bias in healthcare providers using the implicit association test. *Soc Sci Med*. 2018;199:219–229.
- About physical therapists (PTs) and physical therapist assistants (PTAs) ; 2020,. <https://www.choosept.com/aboutptsptas/default.aspx>
- Pennington S. Rural center expands its classification of North Carolina counties ; 2015,. <https://www.nccommerce.com/blog/2015/07/09/rural-center-expands-its-classification-north-carolina-coeunties>
- Greenwald AG, Mcghee DE, Schwartz JL. Measuring individual differences in implicit cognition: the implicit association test. *J Pers Soc Psychol*. 1998;74(6).
- Greenwald AG, Banaji MR, Nosek BA. Statistically small effects of the Implicit Association Test can have societally large effects. *J Pers Soc Psychol*. 2015;108(4):553–561.
- Nosek BA, Smyth FL, Hansen JJ. Pervasiveness and correlates of implicit Attitudes and stereotypes. *Eur Rev Soc Psych*. 2007;18:36–88.
- Project Implicit ; 2021,. <http://implicit.harvard.edu/implicit/takeatest.html>. Accessed
- Valla LG, Boss F, Cali R, et al. Not Only Whites: Racial Priming Effect for Black Faces in Black People. *Basic and Applied Social Psychology*. 2018;40(4):195–200.
- Shutts K, Pemberton CK, Spelke ES. Children's use of social categories in thinking about people and social relationships. *J Cogn Dev*. 2013;14(1):35–62.
- Jacoby-Senghor DS, Sinclair S, Smith CT. When bias binds: Effect of implicit outgroup bias on ingroup affiliation. *J Pers Soc Psychol*. 2015;109(3):415–433.
- Vanpuymbrouck L, Friedman C, Feldner H. Explicit and implicit disability attitudes of healthcare providers. *Rehabil Psychol*. 2020;65(2):101–112.
- Wilson MC, Scior K. Attitudes towards individuals with disabilities as measured by the Implicit Association Test: A literature review. *Res Dev Disabil*. 2014;35(2):294–321.
- Dionne CD, Gainforth HL, Malley O, et al. Examining implicit attitudes towards exercisers with a physical disability. *ScientificWorldJournal*. 2013;p. 621596–621596.
- Robey KL, Beckley L, Kirschner M. Implicit infantilizing attitudes

about disability. *J Dev Phys Disabil.* 2006;18(4):441–453.

20. Keith JM, Bennetto L, Rogge RD. The relationship between contact and attitudes: Reducing prejudice toward individuals with intellectual and developmental disabilities. *Res Dev Disabil.* 2015;47:14–26.

21. Johnson TJ, Winger DG, Hickey RW. Comparison of physician implicit racial bias toward adults versus children. *Acad Pediatr.* 2017;17(2):120–126.

22. Sabin JA, Greenwald AG. The influence of implicit bias on treatment recommendations for 4 common pediatric conditions: pain, urinary tract infection, attention

deficit hyperactivity disorder, and asthma. *Am J Public Health.* 2012;102(5):988–995.

23. Lane WG, Rubin DM, Monteith R, et al. Racial differences in the evaluation of pediatric fractures for physical abuse. *JAMA.* 2002;288(13):1603–1609.

24. McFarland SG, Z C. A cognitive skill confound on the Implicit Association Test. *Soc Cogn.* 2002;20:483–510.

25. Greenwald AG, Nosek BA, Banaji MR. Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *J Pers Soc Psychol.* 2003;85:197–216.

26. Mccambridge J, Witton J, Elbourne DR. Systematic review

of the Hawthorne effect: new concepts are needed to study research participation effects. *J Clin Epidemiol.* 2014;67(3):267–277.

27. APTA Physical Therapy Workforce Analysis: A Report From the American Physical Therapy Association ; 2020,.

28. Data USA. Data USA: Physical Therapists ; 2020,. <https://datausa.io/profile/soc/physical-therapists>

29. USA Census ; 2020,. <https://www.census.gov/quickfacts/fact/table/US/PST045219>

30. Hall JM, Fields B. Continuing the conversation in nursing on race and racism. *Nurs Outlook.* 2013;61:164–173.