Mechanisms of injustice: what we (do not) know about racialized disparities in pain

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1. Introduction

Almost 20 years ago, leaders in pain disparities research challenged pain scientists and clinicians to intervene and advocate for the elimination of inequitable pain treatment based on racialized identity.28 (Table 1). However, despite significant efforts that led to the inclusion of pain disparities in national priorities,34,40 researchers continue to identify greater pain severity, worse pain outcomes, and disparate treatment for minoritized groups.24,65,70

The persistent nature of racialized disparities in pain experience underscores the need for critical action to address this equity-based impasse, particularly amidst the current sociopolitical urgency toward justice and social change for racialized groups.7 As part of this effort, the present review contends that pain disparities are most appropriately conceptualized from an injustice perspective within a larger interacting systems framework. To date, research has focused on the injustice experiences of individuals. However, overlook the systems that maintain and perpetuate injustice has limited our understanding of disparity mechanisms and slowed paths toward intervention.

In this article, we (1) provide a rationale for an injustice lens, (2) describe a model by which levels of injustice create and maintain pain disparities, (3) contextualize current knowledge of racialized pain disparities within this framework, and (4) discuss how this paradigmatic change shifts intervention priorities toward eliminating pain disparities. It is important to note that experiences with injustice are common and significant for most people with chronic pain15,29,96; these experiences are exacerbated for those exposed to multisystemic and intersectional injustice,96,105 and the concepts proposed here should apply and be examined with respect to populations minoritized based on any aspect of their identity. However, to center the experiences of those most affected by injustice and disparate pain outcomes,77 this review will highlight the racialized injustice experience of Black Americans to illustrate how multisystemic injustice disproportionately patterns pain burden across populations.

2. What we know about racialized disparities in pain outcomes

Previous empirical pain research clearly demonstrates racialized disparities across experimental,53 clinical,51,65 and treatment outcomes.56,65,70 A 2017 meta-analysis of experimental findings among clinical and nonclinical samples indicated reduced pain tolerance and greater pain ratings among Black relative to White Americans.53 Black Americans likewise endorse higher levels of pain-related cognitions such as threat or harm appraisal and catastrophizing.51 Systematic reviews also expose significant disparities in pain assessment and treatment—across pain conditions, treatment settings, and subtypes (eg, acute and chronic as well as malignant and nonmalignant pain). Black Americans are more likely to have their pain underestimated20 and receive inferior pain treatment64 relative to White Americans. These disparities are not independent; unfair pain treatment directly results in more severe and unmanaged clinical pain.3,39,65,72

3. Relevance of injustice to health

Injustice is classically defined as a violation of equity or fairness93 and has featured prominently as a fundamental cause in models of health disparities.80 For example, in her ecosocial theory of disease distribution, Krieger explicitly describes health disparities as “biological expressions of injustice.”54 Braverman et al.10 highlight the reciprocal relationship whereby societal injustices (eg, maintenance of intergenerational poverty through prejudicial laws and practices) cause health disparities and poor health compounds’ social disadvantage—reproducing and entrenching disparities. Established models have outlined structural, social, psychological, and biological pathways by which the minoritized experience contributes to negative health outcomes and health disparities.1,50,54,74,80,102

Critically, these models identify multiple hierarchical sources of injustice, including impacts at the cultural, structural, and interpersonal levels, that ultimately affect individual health outcomes.102 However, this framework conceptualizing health disparities as the result and manifestation of multilevel injustice is not well reflected in contemporary approaches and assumptions about pain disparities. In pain research, there has been recent attention to the negative impact of pain-related injustice appraisals, which have been conceptualized as a set of
## Table 1

| Commonly used term | Definition and implication | Term used in this article | Definition and implication | Rationale |
|--------------------|----------------------------|---------------------------|----------------------------|-----------|
| Race               | A sociopolitical construction that historically has been used to uphold racism—to systematically devalue and dehumanize groups of people by inaccurately implying innate or biological differences. | Racialized | Highlights the systematic and historical process by which categories have been constructed and that these categories are part of a system rather than the individuals to which they are applied. | To highlight that such categorizations are products of societal demarcation and processes of oppression and are not innate. |
| Minority           | Often used to reflect people of lower power or status but implies inferiority or that a group has fewer numbers compared with a majority. | Minoritized | Highlights the systematic process by which categories have been constructed while recognizing the innate equal humanity among people with minoritized identities. This term also avoids the numerical inaccuracy of referring to minoritized groups who have a numerical majority in a population (eg, women) as having a minority status. | To highlight that such categorizations are products of societal demarcation and processes of oppression and are not reflective of inferiority or population size. |

This review includes both terms to distinguish between specific societal injustice faced by racialized groups and patterns of injustice faced by groups minoritized by other social identities or conditions more generally.

### 4. Mechanisms of Injustice in Pain Outcomes: a heuristic model

Drawing on the socioecological model, Figure 1 presents a heuristic model of mutually interacting cultural, structural, and interpersonal injustice domains that influence individual-level (intrapersonal) processes and contribute to disparities pain outcomes, offering the architecture to investigate and target these factors. The model illustrates that multilevel external factors (eg, stereotypes and policies) create and maintain the racialized experience and thus the pain outcomes of Black Americans. The model closely aligns with the syndemic theory in acknowledging (1) the longstanding role of societal forces that have resulted in political, social, economic, and power inequities; (2) inequities shaping the distribution of risks and health resources; and (3) the multiple synergistic effects in which power inequities and biological, social, and economic processes overlap. Thus, pain disparities can be seen as culminating from systems of racialized oppression that shape pain trajectories through multiple dynamic pathways, with some pathways increasing the risk for inadequate pain outcomes.

#### 4.1. Cultural injustice

Cultural injustice is sometimes referred to as “societal” or “systematic” and reflects inequities built into or stemming from ideology, values, language, imagery, symbols, and unstatement assumptions. Such values include narratives of colorblindness, individual responsibility, and meritocracy and link to concepts such as just-world beliefs and link to concepts such as just-world beliefs. Cultural and other injustices interact to marginalize systematically oppressed members of society, including in the pain community. Evidence for the power of cultural ideology is reflected in findings of harsher social judgements associated with higher just-world beliefs and greater interpersonal attributions of personal responsibility for pain among overweight women. They are also reflected in erroneous (but strikingly persistent) medical beliefs that Black people do not “feel” as much physical pain. Social psychological evidence that racialized implicit bias is culturally acquired (eg, through classical conditioning) implicates cultural injustice in even automatic processes of interpersonal injustice. Cultural injustice is deeply rooted in the historical oppression that leveraged the dehumanization of Black Americans but is also responsive to the current sociopolitical context. For instance, the Black Lives Matter movement and COVID-19 pandemic have raised broader cultural awareness of the prevalence and significant impact of racialized disparities and collective and individual efforts to spotlight and dismantle cultural injustice. Despite its considerable influence, and recent calls for consideration of the critical impact of social context on pain mechanisms, cultural injustice is perhaps the least discussed and assessed within
pain research. Critically, socioecological and syndemic frameworks identify cultural injustice as fundamental rather than merely contributory to racialized disparities, thus mandating greater attention in our future empirical efforts.

4.2. Structural injustice

Structural injustice is sometimes described as “institutional” and includes inequities built into structures and systems such as government and healthcare organizations. Prejudice in laws, policies, housing, voting, education, employment, policing, and judicial sentencing fall under this domain, as do structures or policies resulting in unequal healthcare access. Like culturally ingrained injustices, seemingly distal structural factors are likely to influence pain outcomes. For example, racialized residential segregation is a structural injustice with wide-ranging consequences for health and pain outcomes, potentially through association with increased risk of poorer quality employment, housing, and school opportunities; increased exposure to pollution and violence; and less availability of healthy food, transportation, recreation, and high-quality healthcare options. Within minoritized communities, segregation leads to greater neighborhood risk (eg, concentrated poverty) and fewer neighborhood resilience (eg, safe walking paths) factors that have been linked to pain outcomes. Structural injustices also affect several individual-level mechanisms that contribute to disparities. For example, residential segregation has implications for physiological dysregulation and inflammation (ie, a biological individual-level process), which may worsen pain outcomes. Furthermore, persistent experiences of structural injustice can—through cognitive behavioral (eg, violated trust in medical and scientific institutions and avoidance behavior) and interpersonal (eg, worsened patient–doctor alliance) mechanisms—undermine individuals’ effective access to systems of medical care and their inclusion in the benefits of pain management. This assertion is supported by findings that, compared with White Americans, Black Americans view revenue generation rather than patient care as most central to healthcare institutions, resulting in lower institutional trust.

4.3. Interpersonal injustice

Interpersonal injustice includes explicit and implicit discrimination and unfair treatment and has received relatively more—yet still limited—attention within pain research. Current research can be divided into 2 broad categories. First, research links interpersonal discrimination to enhanced pain and increased risk of chronic pain. Although it can be argued that perception (and subsequent self-report) are individual-level processes, we place discrimination within the interpersonal domain in recognition of minoritized individuals as reliable reporters of their own interpersonal experiences. Second, research has identified bias in pain assessment and treatment recommendations, providing consistent evidence that provider appraisals are not independent of patients’ racialized, socioeconomic, and sex identities. Emerging research (albeit outside the field of pain) has identified specific provider bias–related behaviors which undermine patient interactions, such as reduced eye contact, specific word choices, and condescending tone and pitch. Although such research is critical to effect change and has contributed to some improvements in care for minoritized groups, it is limited in volume and scope and has been largely divorced from consideration of cultural or structural injustice domains. Similarly, research focused exclusively on patient or provider perceptions does not account for their dynamic effects (eg, patient response to provider underassessment of pain). Thus,

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**Figure 1.** Mechanisms of injustice in pain outcomes. Multiple layers of injustice interact to impact pain processes within individuals and produce different trajectories of pain experience and outcomes. Experiences of injustice are common among people in pain, and this model is meant to be inclusive and applicable to all injustice experiences. Critically, compounding injustice across levels is systematically applied to minoritized groups—creating disparities in injustice exposure that create and maintain disparities in pain outcomes. In this conceptualization, observable disparities in pain outcomes or individual pain processes are the products of—and therefore cannot be disambiguated from—cultural, structural, and interpersonal injustice. This framework also highlights the need for multilevel interventions that target injustice to decrease the societal burden of pain and eliminate pain disparities.
although interpersonal justice implies a bidirectional relationship, most “interpersonal” scholarship has remained locked into an examination of individual-level perspectives.79

4.4. Individual (intrapersonal) processes

Most pain disparities research has focused on characterizing individual-level variables. Our proposed heuristic model acknowledges that pain is ultimately experienced and expressed by individuals and perhaps most proximally affected by traditionally distinguished cognitive, emotional, behavioral, and biological pain-related processes. Research in this area has identified connections between pain disparities and disparities in sleep, depression, pain catastrophizing, activity avoidance, epigenetic processes, and vitamin D deficiency—although, notably, all associated with interpersonal discrimination.4,16,62,63,84,96 Even individual-level injustice appraisals are reinforced through repeated experience and arise in response to environmental and social factors (eg, prior experiences of interpersonal discrimination are associated with greater levels of pain-related injustice appraisals103). Although research on proximal predictors is essential, we argue that, without appropriate contextualization within broader cultural, structural, and interpersonal systems of injustice, a singular focus on intrapersonal processes in pain outcomes impedes empirical progress and meaningful change by inappropriately centering the source of racialized disparities within the individual in pain. This focus on the individual implicitly places the blame and responsibility for change on the very people who are experiencing systemic oppression and greater pain burden6,96 and is upheld by deeply embedded cultural ideologies (eg, meritocracy and just-world beliefs). Ultimately, empirical blindness to larger structures of injustice serves to reinforce these inequitable systems. As Volpe et al.96 have argued, “ahistorical, acontextual, risk-based, and individual approaches” have led to interventions focused on individual stress and coping and, most importantly, have not led to amelioration of health disparities.

5. Considering injustice in pain interventions

Current pain interventions almost exclusively target individual-level processes, limiting conceptualization of pain disparities and ultimately leaving the status quo of profound disparities intact. By contrast, a justice orientation calls for interventions at multiple levels of injustice—rather than those that simply buffer individual-level effects (eg, through interventions targeting coping)—to eliminate disparities.104 In this way, the heuristic model may help identify novel and multilevel targets for pain intervention studies and clinical trials.

Fundamentally, there needs to be recognition that Black Americans in pain are situated within a milieu of cultural, structural, and interpersonal injustice. Without acknowledging the broader context, the risk of building a biased and, possibly invalid, body of research based on individual-level processes increases. Understanding the influence of injustice on pain outcomes in intervention trials will require increased inclusion of Black Americans—not only as participants but also in the development, implementation, and evaluation of pain interventions to ensure generalizability and cultural relevance. Strength-based approaches, community-level interventions, and collaborative community efforts focused on capacity building, and coalition building also work to restore power to oppressed communities.42

Interventions targeting the dehumanizing stereotypes (eg, explicit beliefs that Black Americans are “drug seeking” and experience less pain) that contribute to cultural injustice in pain may include elevation of counter-narratives in training and medical practice as well as in public discourse.42 Within the field of sickle cell research, where pejorative terms such as “sicklers” are still used,35,37 telementoring and knowledge-sharing networks along with emergency department programs have recently emerged as interventions to address injustice at structural and interpersonal levels.36,89

Addressing higher level injustices will also require an expansion of our ideas of pain interventions. A recent study found that food insecurity was a more powerful predictor of chronic pain severity than other well-established health indicators,49 suggesting food insecurity as a target for intervention (eg, provision of food supplements) to decrease pain. This type of intervention—addressing basic needs and considering systemic and policy-level targets—has yet to be examined by pain researchers. There is a critical need for future research and training in this area. Although recent funding mechanisms for structural indicators of health (eg, NIH UNITE initiative to address structural racism) represent a step in the right direction, to honestly address pain disparities, institutional reform working within quality improvement models, collective impact, community engagement, and community mobilization are needed.5

6. Conclusion

Regardless of intent, deeply entrenched injustice has served to provide or defend the advantages of White Americans by disadvantaging Black Americans. The focus on individual-level phenomena has deterred inquiry into pervasive multilevel injustice that affects the lives and bodies of individuals from minoritized groups. Patterns of injustice are closely tied to and uniquely contribute to pain. Contemporary beliefs that Black Americans have diminished capacity for pain echo racist narratives used to justify the historical brutality and infliction of pain on Black bodies.48 The dismissal and devaluing of the pain of minoritized groups functions to deny their humanity and reinforce structural hierarchies of power and oppression.43 This dehumanization, in turn, creates an environment where the specific conditions that increase pain risk are excused and maintained, and interpersonal discrimination in pain treatment is permitted. Pain disparities are evidence of pervasive multilevel injustices that are systematically applied to minoritized individuals, increasing the probability of worse pain outcomes. Centering research and discussions about pain disparities within an injustice perspective illuminates the need for collective action to actualize justice—to be intolerant of and oppose cultural beliefs that perpetuate injustice in pain treatment, to work for societal change to end structural injustice, and to eliminate disparities in pain.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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disadvantage, inflammation and metabolic control in Black and White pediatric type 1 diabetes patients. Pediatr Diabetes 2017;18:120–7.

[24] Craig KD, Holmes C, Hudspith M, Moor G, Moosa-Mitha M, Varcoe C, Wallace B. Pain in persons who are marginalized by social conditions. PAIN 2020;16:261–5.

[25] Cuevas AG, Ong AD, Carvalho K, Ho T, Chan SW, Allen JD, Chen R, Rodriguez J, Biba U, Williams DR. Discrimination and systemic inflammation: a critical review and synthesis. Brain Behav Immun 2020;89:465–79.

[26] Dugan SA, Lewis TT, Everson-Rose SA, Jacobs EA, Harlow SD, Janssen I. Chronic discrimination and bodily pain in a multi-ethnic cohort of midlife women in the Study of Women’s Health across the Nation. PAIN 2017;158:1566–65.

[27] Edwards RR. The association of perceived discrimination with low back pain. J Behav Med 2008:31:379–89.

[28] Ezenwa MO, Molokie RE, Wilkie DJ, Suarez ML, Yao Y. Perceived injustice predicts stress and pain in adults with sickle cell disease. Pain Manag Nurs 2015;16:294–306.

[29] Feagin J. Systemic racism: a theory of oppression. New York: Routledge, 2006.

[30] Feagin JR, O’Brien E. White men on race: power, privilege, and the shaping of cultural consciousness. Boston: Beacon Press, 2003.

[31] Forsythe LP, Thorn B, Day M, Shelby G. Race and sex differences in primary appraisals, catastrophizing, and experimental pain outcomes. J Pain 2011;12:563–74.

[32] Fuentes M, Hart-Johnson T, Green CR. The association among neighborhood socioeconomic status, race and chronic pain in Black and White older adults. J Natl Med Assoc 2007;99:1160–9.

[33] Furnham A. Belief in a just world: research progress over the past decade. Pers Individ Dif 2003;34:795–817.

[34] Gatchel RJ, Reuben DB, Dagenais S, Turk DC, Chou R, Hershey AD, Hicks GE, Liacarides JC, Horn SD. Research agenda for the prevention of pain and its impact: report of the work group on the prevention of acute and chronic pain of the federal pain research strategy. J Pain 2018;19:837–51.

[35] Glassberg J, Tanabe P, Richardson L, DeBaun M. Among emergency physicians, use of the term “Sickler” is associated with negative attitudes toward patients with sickle cell disease. Am J Hematol 2015:88:532–3.

[36] Glassberg JA. Improving emergency department-based care of sickle cell pain. Hematology 2017;2017:412–17.

[37] Goddu AP, O’Connor KI, Lanzkron S, Saheed MO, Saha S, Peek ME, Haywood C Jr, Beach MC. Do words matter? Stigmatizing language and the transmission of bias in the medical record. J Gen Intern Med 2018;33:685–91.

[38] Goodin BR, Pham QT, Glover TL, Sotolongo A, King CD, Sibbile KT, Herbert MS, Cruz-Almeida Y, Sanden SH, Staud R, Redden DT, Bradley LA, Fillingim RB. Perceived racial discrimination, but not mistrust of medical researchers, predicts the heat pain tolerance of African Americans with symptomatic knee osteoarthritis. Heal Psychol 2013;32:1117–26.

[39] Green CR, Anderson KO, Baker TA, Campbell LC, Decker S, Fillingim RB, Kaloukalani DA, Lasch KE, Myers C, Tait RC, Todd KH, Vallerand AH. The unequal burden of pain: confronting racial and ethnic disparities in pain. Pain Med 2003;4:277–94.

[40] Gross J, Gordon DB. The strengths and weaknesses of current US policy to address pain. Am J Public Health 2019;109:66–72.

[41] Hagiwara N, Slater RB, Eggly S, Penner LA. Physician racial bias and word use during racially discordant medical interactions. Health Commun 2017;32:401–8.

[42] Hailes HP, Ceccolini CJ, Gutowski E, Liang B. Ethical guidelines for social justice in psychology. Prof Psychol Res Pract 2021;52:11–11.

[43] Haslam N, Stratemeyer M. Recent research on dehumanization. Curr Opin Psychol 2017;22:111–17.

[44] Herrick C, Bell K. Concepts, disciplines and politics: on “structural violence” and the “social determinants of health”. Crit Public Health 2020. doi: 10.1080/095815962080160673 [Epub ahead of print].

[45] Hirsh AT, Hollingshead NA. Ashburn-Nardo L, Kroenke K. The interaction of patient race, provider bias, and clinical ambiguity on pain management decisions. J Pain 2015;16:558–68.

[46] Hirsh AT, Jensen MP, Robinson ME. Evaluation of nurses’ self-insight into their pain assessment and treatment decisions. J Pain 2010;11:454–61.

[47] Hoffman KM, Trawalter S, Axt JR, Oliver MN. Racial bias in pain assessment and treatment recommendations, and false beliefs about
biological differences between blacks and whites. Proc Natl Acad Sci 2016;113:4296–301.

[49] House-Niamke S, Eckerd A. Institutional injustice: how public administration has fostered and can ameliorate racial disparities. Adm Soc 2021;53:305–24.

[50] Jackson B, Kubzansky LD, Wright RJ. Linking perceived unfairness to physical health: the perceived unfairness model. Rev Gen Psychol 2006;10:21–40.

[51] Janovic MR, McLaughlin SJ, Heapy AA, Thacker C, Pettie JD. Racial and socioeconomic disparities in disabling chronic pain: findings from the Health and Retirement Study. J Pain 2017;18:1459–67.

[52] Karos K, Williams ACdC, Meulders A, Vlaeyen JWS. Pain as a threat to the social self: a meta-analysis. Pain 2013;156:1090–5.

[53] Kim HJ, Yang GS, Greenspan JD, Downot KD, Griffith KA, Renn CL, Johantgen M, Dorsey SG. Racial and ethnic differences in experimental pain sensitivity: systematic review and meta-analysis. PAIN 2017;158:194–211.

[54] Krieger N. Measures of racism, sexism, heterosexism, and gender binaisir for health equity research: from structural injustice to embodied harm-an ecocultural analysis. Ann Rev Public Health 2019;41:37–62.

[55] Kwate NOA, Meyer IH. The myth of meritocracy and African American health. Am J Public Health 2010;100:1831–4.

[56] Lee P, Le Saux M, Siegel R, Goyal M, Chen C, Ma Y, Meltzer AC. Racial and ethnic disparities in the management of acute pain in US emergency departments: meta-analysis and systematic review. Am J Emerg Med 2019;37:1770–7.

[57] Lerner MJ, Miller DT. Just world research and the attribution process: looking back and ahead. Psychol Bull 1978:85:1030–51.

[58] Livingston RW, Drwecki BB. Why are some individuals not racially biased? Soc Sci Med 2005;60:2019–30.

[59] Littman E, Livingstone S, Greaves S, Morgan J, Chinn C, Del Mar C, Green J. Racial determinants of pain associated with the use of prescription opioids. SSM Popul Heal 2021;14:100768.

[60] Lupton D. Sex and the brain: From classical conditioning to cultural bias. Lifespan development and the brain: The perspective of biocultural co-constructivism. New York: Cambridge University Press, 2006. pp. 200–16.

[61] Mauck MC, Linnstaedt SD, Bortsov A, Kurz M, Hendry PL, Bierman KB, Hendry A. Racial bias in anesthesia failure in labor and birth: an examination of women’s sex. Reprod Healthc 2015;4:188–94.

[62] Mozun DM, Taylor RJ, Woodward AT, Chatters LM. Everyday racial discrimination, everyday non-racial discrimination, and physical health among African-Americans. J Ethn Cult Divers Soc Work 2016;26:68–80.

[63] Myers HF. Ethnicity-and socio-economic status-related stresses in context: an integrative review and conceptual model. J Behav Med 2009;32:9–19.

[64] Nelson SC, Hackman HW. Race matters: perceptions of race and racism in a sickle cell center. Pediatr Blood Cancer 2013;60:451–4.

[65] Palermo TM, Riley CA, Mitchell BA. Daily functioning and quality of life in children with sickle cell disease pain: relationship with family and neighborhood socioeconomic distress. J Pain 2008;9:833–40.

[66] Paradies Y, Ben J, Denson N, Elias A, Priest N, Pieterse A, Gupta M, Kahaner G, Gee G. Racism as a determinant of health: a systematic review and meta-analysis. PLoS One 2015;10:1–48.

[67] Penner LA, Dovidio JF, Racial color blindness and Black-White health care disparities. In: Neville HA, Gallardo ME, Sue DW, editors. The myth of racial color blindness: manifestations, dynamics, and impact. Washington, DC: American Psychological Association, 2016. pp. 275–93.

[68] Penner LA, Harper FWK, Dovidio JF, Albrecht TL, Hamel ML, Serfnt N, Eggy S. The impact of Black cancer patients’ race-related beliefs and attitudes on racially discordant oncology interactions; a field study. Soc Sci Med 2017;191:99–108.

[69] Phelan JC, Link BG. Is racism a fundamental cause of inequalities in health? Annu Rev Sociol 2015;41:311–30.

[70] Pipher EA. Emotion, learning, and the brain: From classical conditioning to cultural bias. Lifespan development and the brain: The perspective of biocultural co-constructivism. New York: Cambridge University Press, 2017.

[71] Ransw J. A theory of justice. Cambridge. United Kingdom: Belknap Press, 1971.

[72] Riley JL, Wade JB, Myers CD, Sheffield D, Papas RK, Price DD. Racial/ ethnic differences in the experience of chronic pain. PAIN 2002;100: 219–35.

[73] Ross CE, Mirowsky J. Neighborhood disadvantage, disorder, and health. J Health Soc Behav 2001;42:258–76.

[74] Rothstein R. The color of law: a forgotten history of how our government segregated America. New York/London: Liveright, 2017.

[75] Sacks RS, Palermo TM, Riley CA, Mitchell BA. Daily functioning and quality of life in children with sickle cell disease pain: relationship with family and neighborhood socioeconomic distress. J Pain 2008;9:833–40.

[76] Schild C, Reed E, Hingston T, Dennis C, Wilson A. Neighborhood disadvantage, disorder, and health. J Health Soc Behav 2001;42:258–76.

[77] Smith CR, O’Mara E. Ethnicity-and socio-economic status-related stresses in context: an integrative review and conceptual model. J Behav Med 2009;32:9–19.

[78] South KW. Racial and ethnic differences in the experience of chronic pain. PAIN 2002;100: 27150–5.

[79] Schild C, Reed E, Hingston T, Dennis C, Wilson A. Neighborhood disadvantage, disorder, and health. J Health Soc Behav 2001;42:258–76.

[80] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[81] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[82] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[83] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[84] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[85] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[86] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[87] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[88] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[89] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[90] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[91] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[92] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[93] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[94] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[95] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[96] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[97] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[98] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[99] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.

[100] Sibley B. Bringing psychological science to bear on racial health disparities: the promise of biocultural co-constructivism. New York: Cambridge University Press, 1971.
of centering Black health through a critical race framework. Transl Issues Psychol Sci 2019;5:302–14.

[99] Wallace B, Varcoe C, Holmes C, Moosa-Mitha M, Moor G, Hudspith M, Craig KD. Towards health equity for people experiencing chronic pain and social marginalization. Int J Equity Health 2021;20:53.

[100] Webb Hooper M, Mitchell C, Marshall VJ, Cheatham C, Austin K, Sanders K, Krishnamurthi S, Grafton LL. Understanding multilevel factors related to urban community trust in healthcare and research. Int J Environ Res Public Health 2019;16:3280.

[101] Wheelis T, Allison A, Nowlin L, Hollingshead N, de Ruudere L, Goubert L, Hirsh A, Trost Z. Disparities in gender and weight bias toward chronic low back pain patients. J Pain 2015;16:S96.

[102] Williams DR, Lawrence JA, Davis BA. Racism and health: evidence and needed research. Annu Rev Public Health 2019;40:105–25.

[103] Williams DR, Lawrence JA, Davis BA, Vu C. Understanding how discrimination can affect health. Health Serv Res 2019;54:1374–88.

[104] Williams DR, Purdie-Vaughns V. Needed interventions to reduce racial/ethnic disparities in health. J Health Polit Pol L 2016;41:627–51.

[105] Ziadni MS, Sturgeon JA, Bissell D, Guck A, Martin KJ, Scott W, Trost Z. Injustice appraisal, but not pain catastrophizing, mediates the relationship between perceived ethnic discrimination and depression and disability in low back pain. J Pain 2020;21:582–92.