

Gender, Racism, and DOHaD

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6.1 Introduction

Contemporary scholars, many of whom are included in this edited volume, have highlighted the gendered dimensions of DOHaD research, noting its social and historical contours and consequences, particularly for women and mothers [1–4]. This chapter furthers these important discussions by highlighting how a gendered analysis of DOHaD must focus not only on how women's bodies and lives are taken up and affected by science but also on DOHaD's relationship to racism. By examining DOHaD through a feminist and critical race lens, we address how *both* gender and racism operate as relations of power in and through this science. Our analysis critically examines how gender has traditionally been studied as distinct from race and racism in DOHaD research, and the need to do otherwise.

This approach reflects our interest in transformational feminist interventions in the life sciences, and the need to centre reproductive justice and anti-racism in these efforts. Rather than seeing categories like gender, race, and class as discrete variables that merely need to be included or compared to one another in DOHaD and other areas of research, here we draw on Black feminist scholarship to highlight gender and racism as mutually constructed and reinforcing power relations that inform the history and contemporary contours of DOHaD and its ongoing effects. By analysing these dimensions of the science, this chapter reflects how gender and racism unequally survey and manage the living conditions and behaviours of Black, Brown, and Indigenous bodies, highlights the unequal impacts of DOHaD research, and reflects the need for a critical gender analysis of DOHaD and other postgenomic sciences [5]. Our analysis therefore focuses on how gender is always already bound up with racism and other forms of oppression, and how this shapes the practices and possible futures of DOHaD in critical ways.¹

6.2 Gender, Reproduction, and Biopolitics

We begin this chapter with a review of feminist and critical race analyses of reproduction and an emphasis on biopolitics and processes of medicalisation that are central to the focus on pregnancy and early development in DOHaD research. Biopolitics refers to how the population emerged as a political problem to be managed by the state, and medicalisation focuses on how domains of social life become defined as medical problems [6, 7]. We discuss these concepts and their contributions to our analysis in relation to the

¹ For more on race in DOHaD research, see Meloni et al. in this volume.

‘politics of reproduction’, which Ginsburg and Rapp [8] developed to explore the vital role that reproduction plays in social and institutional organisations [9]. Engaging these approaches and their intersections is important, as DOHaD has increasingly become central to reproductive science, medicine, and conceptualisations of health and illness more broadly [10, 11]. Further, Lappé, Jeffries Hein, and Landecker have framed DOHaD and its sibling science environmental epigenetics as part of an ‘environmental politics of reproduction’ to address the intersections of the environment and reproduction in late capitalism [12].² This approach and others explicitly highlight the racialised politics of reproduction in contemporary DOHaD and environmental epigenetics research and how broader relations of power shape these sciences and their effects [13–15]. Drawing on this rich set of literature, this section positions gender and DOHaD as part of a larger feminist discussion on the biopolitics of reproduction and in relation to race/racism, a term that Valdez uses to intervene on references to race as if it were not always already embedded in racist logics [16]. While our own work is situated in the United States, Canada, and the United Kingdom, here we draw on scholarship across various locations to illustrate why a critical gender analysis is necessary anywhere DOHaD research is conducted and circulates.

Reproduction was and often still is conceived of only as a ‘woman’s issue’ with the science and medicalisation of reproduction centred largely on cis-gendered women’s bodies. Numerous scholars have analysed how DOHaD’s focus on pregnancy reinforces this emphasis and positions cis-gender women as central objects of study and primary targets of intervention [17]. DOHaD researchers claim to study this period of the lifecourse because of the unique plasticity and programming of biological systems during ‘critical windows’ of fetal development. However, historians of maternal–fetal relations argue that this emphasis on pregnancy shapes and is shaped by gendered forms of social control and surveillance that have been central throughout the history of the reproductive sciences [1, 18].

Scholars of the contemporary also illustrate how a focus on the individual behaviours and exposures of pregnant people in DOHaD research overwhelmingly positions mothers as primarily responsible for the health of future generations. For example, Pentecost and Ross, Sharp and Richardson, Warin, Moore and Davies, Kenney and Müller, and others discuss how DOHaD emphasises pregnancy as an ideal time for research and intervention, despite the recognition that social environments shape health throughout the lifecourse [2, 4, 19, 20]. These authors and others show how the focus on early life and pregnant bodies within DOHaD studies relies on and reinforces self-surveillance and anticipatory care work for people with the capacity for pregnancy [11]. In their chapter in this volume, Chiapperino and colleagues also detail how DOHaD influences gendered responsibilities for health in ways that reinforce the gender binary and unequally impact women’s bodies and lives. This occurs around food and nutrition, as Moore and Warin discuss in this volume, and in relation to pollutants, pesticides [21], and stress [22], in ways that disproportionately affect Black, Brown, and Indigenous lives [13, 23], as we discuss below.

² DOHaD often draws on epigenetic mechanisms to explain the links between gestational exposures and intergenerational health outcomes, and its focus on pregnancy and reproduction brings studies across DOHaD and epigenetics together, even while the fields also remain distinct.

Of course, as numerous scholars of gender, women's, and queer studies reflect, reproduction is not only the domain of cis-gender women. Recently, feminist science studies scholars in particular have brought attention to the missing science of men's reproductive contributions and paternal effects [24], providing a necessary intervention into discussions of gender and DOHaD [1]. Feminist science studies is a transdisciplinary area of scholarship that addresses how gender and other social categorisations shape and are shaped by science and technology. While these specific interventions are important to consider, our review of biopolitics, medicalisation, and the politics and environmental politics of reproduction in this section reflects that merely expanding scientific and medical surveillance to men deemed capable of reproduction will do little to address how power relations influence DOHaD science and its unequal impacts. Rather, we argue that a critical gender analysis must focus on the racial and gender politics of DOHaD and question the premise that individuals are the appropriate target for intervention at all. Doing so relies on well-established literature that actively positions reproduction as a topic crucial to social theory [25]. As we detail below, a continued focus on individual bodies as sites of intervention, rather than on broad social structures and power relations, reflects the convergence of biopolitics and reproductive politics within DOHaD and underscores the need to address the central logics that influence this science [6, 9].

Biopolitics and the politics of reproduction illuminate how social institutions like medical and population health programmes, as well as the military-industrial complex, provide the infrastructure that makes it possible to systematically collect health data and the unequal impacts of these efforts. This is important for our analysis because foundational observational studies that inform DOHaD's focus on the long-term health consequences of experiences and exposures during early development were originally based on the systematic collection of state and military health records [26]. The concept of biopolitics therefore allows us to address how power relations and social institutions have shaped DOHaD and its relationships to race/racism from its very beginnings and their ongoing effects today.

In his elaboration of the concept of biopolitics, Foucault argued that because of a fundamental shift in European nation-states during the seventeenth century, individual bodies became a key target for the maintenance of the nation. In that context, he argued that individual and aggregate bodies became important for protecting and defining the state, nation, or population, and keeping bodies healthy became crucial to produce labour and maintain the military. While Foucault focused on the management of 'families' as the fundamental units of the population [6], feminist scholars highlight that the 'family unit' Foucault imagined was primarily the bodies and behaviours of women [27]. Feminist scholars of colour have arbitrated further by emphasising that Black, Brown, and Indigenous reproduction is seen by the nation-state as a threat to the white supremacist imagination across multiple locations and time periods [23, 27].

The connection between individual bodies and the body of the nation has therefore justified the control and intervention of people's reproductive capacities in numerous ways. Public health campaigns from the nineteenth and twentieth centuries targeted poor women to reduce their fertility rates and prescribed a 'domestic science' of house cleaning for germ prevention [28]. Later approaches focused on behaviours related to alcohol and tobacco consumption [29] and breastfeeding [30]. In more contemporary examples, forced sterilisation of immigrant populations, family separation at the United States and other borders, expansive juvenile detention, and the overturning of Roe

v. Wade in the United States provide just a few of the state-endorsed reproductive and family policies that emerge from racist, nationalist, and xenophobic laws and policies [31–33].

The medicalisation of reproduction was also founded on the biopolitical aim of controlling and managing people's reproductive capacities and frames pregnancy as an illness that requires medical intervention and surveillance [34]. Riessman argues that the medicalisation of reproduction is a 'contradictory reality for women' [35, p. 16] as it provides certain women a way to gain some control and autonomy over aspects of reproduction while strengthening the control of biomedicine to define and survey reproductive experiences. We draw on this approach to emphasise that not all women and non-binary people experience 'reproductive freedoms'. Rather, as Black feminists argue, current notions of reproductive 'freedom' that focus on bodily autonomy and choice are based on systemic forms of control, exploitation, and oppression forced upon formerly enslaved people over the course of hundreds of years and continue to affect Black, Brown, and Indigenous lives today [27].

To study these dynamics of reproduction, feminist scholars have developed a varied repertoire of tools and frameworks important to a critical gender analysis of DOHaD. Central to these, and part of the politics of reproduction introduced at the beginning of this section, is Ginsberg and Rapp's notion of 'stratified reproduction'. This concept describes how political, economic, and social forces create the conditions under which people carry out reproductive labour [36]. Stratified reproduction emphasises the need to explore reproductive experiences based on social, racial, and gendered locations and reflects how the treatment of people's reproduction is not equally valued: certain people's reproduction is cherished, while the reproduction of others is denied and denigrated [13, 26, 35–37]. This is a critical lens through which to understand how gender has always been tied to race and racism within the sciences associated with reproduction, including DOHaD.

Another key concept for understanding the politics of reproduction, especially in a postgenomic era, is the Reproductive Justice (RJ) framework developed by the SisterSong collective [23, 38–40]. It focuses on how racism shapes reproductive experiences and prioritises the stories of women of colour as the foundation for new knowledge. Reproductive Justice also emphasises how social justice issues like mass incarceration, premature death, disinvestment in public services, and environmental justice are all reproductive issues. This approach highlights how the management of population health through the control of reproduction was operationalised at the level of the individual through ideas of responsibility that were always deeply connected to racist ideologies. Thus, the RJ framework aims to move beyond the individualistic and neoliberal discourse of 'choice' to recognise that not everyone lives in an environment that provides them with the same options from which to choose [41].

Applying these feminist and critical race concepts allows us to explore how DOHaD theories *deepen* the stratification of reproduction. For example, in her book *Weighing the Future*, Valdez highlights how contemporary pregnancy trials that draw on DOHaD and epigenetic theories to study how maternal diet during pregnancy impacts children's health outcomes are akin to nineteenth- and twentieth-century biopolitical strategies that focus on controlling, managing, or surveying women's bodies and behaviours. Her analysis shows how, historically and presently, the surveillance and control of reproduction are unevenly distributed across populations based on race and class. Through her

ethnographic study, Valdez illustrates how this occurs through what she calls the ‘politics of postgenomic reproduction’, a framework that examines how new science and technology emergent in a postgenomic era, including the fields of epigenetics and DOHaD, create conditions that both enliven twentieth-century reproductive politics and stimulate novel iterations of surveillance, risk, and control in the twenty-first century [16].

This feminist lens critically attends to issues of race and gender in two main ways: its application is based on the premise that processes of racism are enacted in and through reproduction and that queering reproduction requires a reframing of the maternal environment that is not biologically and genetically essentialised or individualised to cis-gendered bodies deemed capable of reproduction. Queering reproduction reflects the need to rethink reproduction beyond heteronormative, cisgender, white supremacist, and biocentric ways of thinking and aligns with the ethic of recent feminist scholarship on the environmental politics of reproduction as well. Building on the politics of reproduction and the intellectual and advocacy movements of RJ and Environmental Reproductive Justice (ERJ), Lappé, Jeffries Hein, and Landecker’s analysis of the environmental politics of reproduction critically addresses the intersections of lived experiences of oppression, environments of late capitalism, and postgenomic sciences to illustrate how human reproduction is increasingly bound up with environmental issues in ways that are always already connected to gender and racism [12]. Both the politics of postgenomic reproduction and environmental politics of reproduction therefore highlight how racism, white supremacy, and neocolonialism shape the unequal distribution of resources, lived experiences of reproduction, and the practices and ethics of emergent sciences [12, 41]. Alongside the concepts detailed above, this scholarship provides a critical entry point for addressing the intersections of gender and racism in DOHaD science today.

6.3 Don’t Blame the Poor Black, Brown, and Indigenous Pregnant Person

Two examples from our own scholarship illustrate how the emphasis on the bodies and behaviours of cis-gendered pregnant women and a lack of attention to racism and stratification influence the practices and consequences of contemporary DOHaD science. Our findings and the work of others reflect that even when measures of race and socio-economic status (SES) are incorporated into DOHaD studies, merely including these variables does little to address how *racism* shapes lived experiences or to dismantle the gendered and racial logics that inform many DOHaD studies [16, 45]. These examples show that inconsistent and superficial measures of race and class often stand in for the deeply embedded power relations that influence health outcomes of central interest in the studies we follow. Thus, both examples introduced in this section reinforce the need for critical gender analyses of DOHaD and other postgenomic sciences that attend to the ways that gender and race/racism shape research practices, knowledge claims, and the impacts they have on experiences of reproduction and the broader environments that influence health across the lifecourse.

The first example comes from Valdez’s ethnographic study of contemporary postgenomic pregnancy trials in the United States and United Kingdom. Introduced briefly above, her influential project draws on critical race theory and Black feminist theory to address how race/racism is foregrounded at the recruitment phase of trials focused on

maternal diet during pregnancy and children's future health and then disappears during the collection and analysis of the trials, only to return as significant in the comparison of outcomes in the publication of results [16, 42]. Her findings reflect how race is imbued with meaning, yet remains mercurial and mobilised in ways that distance it from the contexts and relations of power that shape the lives of trial participants.

Valdez's findings illuminate the need to shift the focus away from diversity and inclusion efforts in postgenomic research and instead theorise how *racist environments* impact maternal health outcomes across the lifecourse [16]. Her work shows that individual-level interventions, which are central to these trials, need to be read as symptomatic of systemic racism, rather than as a solution to multidimensional illnesses like diabetes and obesity that disproportionately impact communities of colour. This is because the 'underlying logics of individual lifestyle interventions are cut from the same ideological cloth that assumes poor, fat, and ethnically diverse individuals have risky bodies and are responsible for changing their bodies and behaviors' [16, p. 10].

While such individual lifestyle interventions are framed as if all bodies live in similar environments and have equal access to 'healthy' opportunities, choices, and material conditions, Valdez shows that the pregnant people classified as 'high risk' for diabetes and obesity that are targeted for these interventions live in racist and poorly resourced environments that make it nearly impossible for them to comply with the intervention during the trial or sustain the intervention changes after the trial is completed. These findings reflect a key aspect of our argument here, which is that gender analysis without a critical understanding of race/racism is not a comprehensive framework for understanding DOHaD science and its consequences. This is particularly so when numerous studies show that focusing solely on individual interventions in maternal nutrition or early care is ineffective in addressing health and disease inequities [43].

In our second example, Lappé's multi-sited ethnographic study of epigenetic research related to children's behavioural health finds a similar emphasis on cis-gender women and their individual care practices during pregnancy and early parenthood, rather than on the structural conditions that shape their lives. Lappé's project focuses on the production and circulation of epigenetic and DOHaD knowledge related to children's behavioural health across laboratories, clinics, and communities in the United States and Canada. By studying the material practices and epistemic cultures that inform this science and its translation, she shows how many studies and initiatives focus on early-life adversity (ELA) as central in their broader questions about children's behavioural health. She finds that scientists and others often use ELA to capture how myriad early-life experiences, including neglect, abuse, and poverty, shape health trajectories across the lifecourse [12, 44, 45].

Through her observations of behavioural epigenetic studies and their translation, Lappé describes how past and present DOHaD theories and findings critically inform the practices and impacts of these efforts [44, 45]. For example, even when epigenetic scientists, clinicians, and community members emphasised the health impacts of racism as primary motivations for their work, she finds that standardised measures of race and disadvantage used in many studies provide poor proxies for how racism and gender mutually shape lived experiences of pregnancy, parenting, and children's health. Often limited to self-reported race, maternal education, and SES, Lappé reflects how scientists themselves noted the limitations of these measures, which nevertheless became built into large-scale epigenetic studies of children's health. Her analysis shows how these measures

and the primary focus on cis-gender women's behaviours do little to address how systemic oppression influences the outcomes of interest in the studies she follows [45].

Lappé also finds that epigenetic and DOHaD studies of early life often build on previous results from animal models to focus primarily on the effect that women's behaviours and experiences during pregnancy and early parenthood have on their children's future health. As a result, concerns about the health effects of racism become channelled through measures and analyses that emphasise the maternal–child dyad and women's care practices, rather than on how racist and sexist environments influence their lives. Even when studies aimed to improve children's health through supporting families, the focus on women's behaviours and experiences during pregnancy and postpartum had the effect of individualising responsibilities for children's health, rather than addressing the need for broader social and structural change [46].

The analyses provided in these two empirical examples reflect how narrow and persistently individualistic models in DOHaD and epigenetic research focus on binary notions of gender and do little to address how systemic racism shapes experiences of reproduction and health across the lifecourse. The absence of *racism* as a central factor in prominent DOHaD studies therefore helps perpetuate understandings of health and inequity that overemphasise comparisons across racial and ethnic groups while ignoring the role of systemic racism in shaping health inequities. Such understandings reflect how race and ethnicity continue to be used in DOHaD and postgenomics research despite the knowledge that it is *racism* that fundamentally shapes health inequities across all gradients of income [5, 47, 48].³ Further, the focus on behaviours during pregnancy and early life in these and many other studies reinforces the individualised focus on cisgender pregnant women and mothers, rather than emphasising the unequal social environments that shape their lives.

These findings matter as new epigenetic and biopolitical strategies in the postgenomic era emphasise how present exposures and experiences may shape both intergenerational and transgenerational health. This extension of individualised responsibilities can further white supremacist and neoliberal notions of health by ignoring the connections between gender, racism, and reproduction. A feminist and critical race lens draws attention to these dimensions of DOHaD science and their unequal consequences, particularly when studies are overly dependent on individual-level interventions. The persistent focus on cisgender bodies and race, rather than racism, in DOHaD research also reflects how systemic racism and late liberalism shape science. The findings described in this section therefore reinforce the importance of addressing how gender and racism operate as mutually constituted power relations that shape DOHaD research and its effects in the world.

6.4 Conclusion

Over the past several decades, scholars have drawn more awareness to how systemic racism and other forms of oppression impact health, pointing to structural and institutional power relations, rather than individual actions, as critical sites for intervention. This work builds on a history of activism by Black, Brown, and Indigenous communities to address how racism, violence, and environmental injustice shape health inequities and

³ See Meloni et al. in this volume on race and DOHaD research.

lived experiences of reproduction [49, 50]. As we have illustrated above, these agendas and those in critical gender studies offer opportunities for DOHaD researchers to examine their research, its history, and its current mobilisations to address how gender and racism shape this science.

Through the frameworks and empirical research introduced above, we have shown that merely including gender, race, ethnicity, and class as variables of interest in DOHaD research does little to address how the mutually constituted power relations of gender and *racism* shape science and its unequal impacts on people's lives. Addressing this is of utmost importance as Black, Brown, and Indigenous people have been and continue to be exploited through scientifically legitimised narratives that allow the state to remove their autonomy, force reproduction and sterilisation, and deny their reproductive rights [27, 51]. As reflected in rates of premature birth and maternal mortality among Black women in the United States regardless of SES, the relationships between gender and racism shape health inequities in clear and ongoing ways [48, 52]. These forms of 'obstetric racism' and the analysis we provide above reveal how gender is always already bound up with racism and other forms of oppression [34].

To address gender and racism in DOHaD, interdisciplinary engagements with this science must explicitly name how power relations shape research and its effects. In this chapter, we have highlighted how a feminist and critical race approach to gender and racism in DOHaD is necessary to accomplish this goal. In doing so, we advocate for critical gender analyses that push social and biological scientists alike to examine how systems of oppression inform research and its unequal impacts in the world. We end by highlighting the need to move beyond description and critique to create real change in the structures that affect people's lives. This requires not only rethinking how we analyse DOHaD science but also actively reshaping the racist environments that impact health [53, 54].

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