

The Ethics of Biosocial Science

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Her work in law and public policy focuses on urgent contemporary issues in health, social justice, and bioethics, especially as they impact the lives of women, children, and African Americans. Her major publications include *Fatal Invention: How Science, Politics, and Big Business Re-create Race in the Twenty-First Century* (New Press, 2011), *Shattered Bonds: The Color of Child Welfare* (Basic Books, 2002), and *Killing the Black Body: Race, Reproduction, and the Meaning of Liberty* (Pantheon, 1997).

LECTURE I.
THE OLD BIOSOCIAL AND THE LEGACY
OF UNETHICAL SCIENCE

INTRODUCTION

What is the relationship between biology and society?

This question has set the fundamental framework for science for more than a century. At the close of the nineteenth century, European and US scientists, such as the British biologist Francis Galton—known as the “father of eugenics”—erected a wall between these two realms by separating nature (the biological) from nurture (the social).¹ This enabled them to claim that the unequal social order was caused by differences in biological traits that socially privileged and socially disadvantaged people were born with.

Today, science is undergoing a spectacular paradigm shift that is radically altering the way we understand that basic boundary between biology and society.² Indeed, the boundary is exploding. Dramatic new knowledge acquired over the last several decades about the way genes function renders untenable the view of heredity as immune from social influences. More than that, discoveries about epigenetics, brain function, and the microbiome demonstrate that the social environment profoundly affects biological processes, so that society becomes *embodied*.³ In other words, the biological and the social are inseparable.

Some scholars have heralded this biosocial moment as a clean break from the past schism between biology and society.⁴ I would like to reframe this revolution in science to scrutinize when it departs from old biosocial thinking and when it drags along key elements of the past. To begin with, it is not true that the old paradigm ignored the interplay between the biology of human beings and the societies they live in, whereas the new biosocial science embraces it. Scientists using both paradigms investigate the connection between biology and the social order, and employ biological knowledge to improve society. Even before they discovered the gene, scientists in Europe and the United States supported unjust social hierarchies by claiming they were biologically determined.

Thomas Jefferson—a naturalist as well as a political philosopher—approached the question of slavery from a biological and social point of view. In *Notes on the State of Virginia*, published in 1781, Jefferson explained that “the real distinctions which nature has made” between blacks and

whites made it impossible for them to live together as equal citizens.⁵ “This unfortunate difference in colour, and perhaps of faculty,” he wrote, “is a powerful obstacle to the emancipation of these people.”⁶

Mainstream science now largely disavows old biosocial ways of thinking, such as eugenics, evolutionary explanations for gender inequality, and biological concepts of race, as profound misinterpretations of the relationship between biology and society that have supported horrific acts of inhumanity. The emerging biosocial science investigates instead the impact of social environments on human bodies. Rather than explain social inequality as biologically predestined, these scientists show how social inequality produces disparate biological outcomes.

To simplify and emphasize the distinction I am making between these two scientific approaches: one posits that biological differences produce social inequality; the other, that social inequality produces biological differences. It is this inversion of the causal relationship between biology and social inequality that distinguishes what I will call the old biosocial and the new biosocial sciences. The distinction I am making revolves around their theories for explaining the relationship between biology and society, a distinction that is not bound by historical timeframes or academic disciplines.

Relating the biological to the social is not itself antiquated or modern; it is not scientific or unscientific; it is not just or unjust. We must ask, What are the values underlying differing approaches to the relationships between biology, society, and justice? Can we identify the features of biosocial ideologies and practices that make them ethical or unethical? Can this analysis help to ensure that the new biosocial revolution does not repeat the injustices of the past? Without such scrutiny of their assumptions, methods, and, indeed, their values, the new biosocial scientists, like the old biosocial scientists, risk reinforcing rather than contesting today’s unjust social order. In my first lecture, I examine the ethical flaws of the old biosocial science. In my second lecture, I examine the ethics of the new biosocial science by testing to what extent it replicates or contests the errors I identified.

I begin with a few observations about the contours of my scientific and ethical inquiry. First, the science: biosocial science spans a gigantic and expanding range of research projects that explore the complex interactions between the social environment and human biology. I am interested in scientific projects that claim to explain the relationship between biology and *social inequality*, in particular. Second, the ethics: in the decades following

World War II, the Nuremberg Code, the Declaration of Helsinki, and the Belmont Report established ethical standards to help govern science going forward in an effort to prevent the atrocities many scientists committed in the past.⁷ Biosocial research raises a number of these ethical issues. How should scientists protect the autonomy of research subjects whose blood is drawn, cheeks swabbed, and brains scanned? What about the privacy of the biological and social data they collect, store, and analyze? What are valid and invalid uses of all this biosocial information by courts, insurance companies, and government agencies? These are all fascinating and crucial questions biosocial researchers must address. However, I want to evaluate the ethics of biosocial science according to the principle that is most at stake in scientists' claims about biology and social inequality—that is, justice.

Justice is achieved when our society's institutions respect everyone's human rights equally and do not systematically distribute advantages—such as education, health care, and housing—and disadvantages—such as police profiling, incarceration, and pollution—to groups of people according to their positions in hierarchies of power.⁸ I am evaluating both the old and new biosocial sciences according to this ethical principle of justice, although I recognize that the meaning of justice is unsettled and that old biosocial science emerged before it was widely accepted that scientists should be governed by ethical principles at all. I am not interested in judging biosocial scientists for violating the set of principles that governed them at the time; I am interested in examining how their assumptions, theories, and methods have advanced or impeded the moral norm of justice.

My objective is not to denounce science that investigates the interplay of biology and society but to think more strategically and imaginatively about how it can proceed in a way that actually achieves its asserted aim to reduce social inequalities. To advance an ethical future for science, I conclude, we need a more radical rethinking of the relationship between biology, society, and justice.

THE INVENTION OF RACE AS BIOSOCIAL SCIENCE

The scientific invention of race as a biological division of human beings was foundational to Western biosocial science. Embedded in the biological concept of race is the claim that the inherent characteristics of individuals determine their status in society.⁹ European typologists invented race and claimed it was a biological trait rather than a political relationship

in order to justify Europeans' subjugation of other peoples through conquest, slavery, and colonialism.¹⁰ Transported to revolutionary America, the biological concept of race served an important ideological function. Pointing to biological distinctions between races was essential to justifying the enslavement of Africans in a nation founded on a radical commitment to liberty, equality, and natural rights.¹¹ White Americans had to explain black subjugation as a natural condition, not one they imposed by brute force for the nation's economic profit.

Genetic determinism—the theory that genes program individuals' phenotypes, including their behaviors and abilities—is often conflated with the old biosocial science. But race preceded genetic determinism.¹² The belief that race is part of nature profoundly influenced Western biological and social sciences and shaped their understanding of the relationship between biology and society in ways we have yet to grasp.¹³ Evolutionary biologist Joseph Graves points out that biological determinism predates the twentieth-century disciplines of evolution and genetics and even the nineteenth-century formation of biology as a science. “Biological determinism,” he writes, “survived and flourished during the turnover from supernaturalist to scientific explanations of human origins and potential.”¹⁴

The biological race concept is a creationist belief that has amazingly survived major scientific revolutions, beginning with the Enlightenment. The trial judge who convicted Mildred and Richard Loving in 1959 for violating Virginia's ban on interracial marriage explained, “Almighty God created the races white, black, yellow, malay and red, and he placed them on separate continents. And but for the interference with his arrangement there would be no cause for such marriages.”¹⁵ His view mirrors the scientific understanding of race as an innate attribute produced by human evolution that exists prior to and separate from society. The resilience of the creationist concept of biological races surely was critical to the transmission of the creationist concept of biological determinism into modern science.

Making race revolve around biology constructed it as an innate, permanent, and inescapable status. In a respected text, *Anthropology: Biology and Race*, first published in 1923 and reprinted in 1948 and 1963, the influential anthropologist Alfred Kroeber stated the nature of race as a matter of hereditary fact: “To the question of why a Louisiana Negro is black and longheaded, the answer is ready. He was born so. As cows produce calves, and lions, cubs, so Negro springs from Negro and Caucasian from Caucasian. We call the force at work heredity.”¹⁶ As an inherited status, race seems to be passed down simply through the biological process of procreation.

Because race is actually a political category, however, white lawmakers never left reproducing it to heredity alone. One of America's very first laws, enacted in Virginia in 1662, helped to define racial boundaries by regulating the inherited status of children. Noting the biosocial quandary, "Whereas some doubts have arisen whether children got by an Englishman upon a negro woman should be slave or free," the statute clarified the matter by conveniently declaring that the children's status followed the condition of their mothers.¹⁷ So black women gave birth to enslavable children even if their fathers were white. A. Leon Higginbotham notes, "Prior to the passage of this statute it had been an open question as to whether the normal doctrine of English law would be applicable—that the status of the child would be dependent upon the status of the child's father."¹⁸ White settler colonists altered the English laws of inheritance and kinship to devise the delusion that enslaving their own children followed the laws of nature. The biosocial claim that race is inherited cast black women's bodies as the producers of their children's subjugated political position.

Centering the reproduction of slave status in black women's wombs served dual purposes. It excused state violence against black women as necessary to manage their procreative labor, which produced the property needed to maintain the slave system.¹⁹ At the same time, it attributed the suffering slavery inflicted on black people to the inferior qualities black women supposedly transmitted to their offspring.

Medical researchers of the day elaborated the claim that race is inherited by investigating racial differences in disease. The racial concept of disease—that people of different races suffer from different diseases and experience common diseases differently—was presented as proof not only that race is biological but also that biological distinctions between the races—particularly black pathology—caused racial inequality.²⁰

After attending the University of Pennsylvania Medical School, Dr. Samuel Cartwright practiced in the Deep South in the 1850s and became a well-known expert on what was then called "negro medicine."²¹ Cartwright argued that slavery was beneficial for black people for medical reasons. He claimed that because black people had lower lung capacity than whites, forced labor was good for them. He wrote in a medical journal: "It is the red vital blood sent to the brain that liberates their minds when under the white man's control, and it is the want of sufficiency of red vital blood that chains their minds to ignorance and barbarism when in freedom."²² By converting race into biological difference, Cartwright made enslavement of Africans seem like a form of freedom and made black freedom seem like bondage.

After slavery ended, white scientists blamed black people's deteriorating health on a biological incapacity to adjust to freedom.²³ Locating blacks' inferior status in biological susceptibility to the changing social environment provided a reason to retain white supremacy. Instead of dismantling the social order inherited from slavery, scientists argued that the best way to improve the condition of emancipated blacks was through either benign neglect or coercive medical intervention. This updated biosocial theory excluded from scientific inquiry the reality that, at the time, whites were violently reinstating black people's slave status through Ku Klux Klan terror, the convict lease system, and voter disenfranchisement.

Just as Cartwright explained the symptoms of black oppression as caused by race-specific disease, so he explained black resistance as a symptom of race-specific disease. Cartwright coined the term "drapetomania"—combining Greek words for "runaway slave" and "crazy"—to describe the mental disorder that caused enslaved blacks to flee plantations.²⁴ According to his logic, if enslavement was good for black people's health, then an enslaved person would have to be crazy to run away from it. A biologically normal black person should be happy to be enslaved. Similar to his correction for race in his measurements of human lung function—a practice that continues in medicine today—Cartwright corrected for race in his understanding of human freedom.²⁵

In his speech to the National Press Club in 1986, James Baldwin pointed out that the Noble Savage of Africa had to become the Happy Darkie in the Americas: "If I wasn't happy then there was something wrong with slavery," Baldwin explained. "So I had to be happy to keep the master happy."²⁶ Baldwin went on to note the moral and epistemological perversion entailed in the racial delusions needed to make the master happy. "We are living with these myths until today and it corrupts the view from here," he said. "Out of this profound misapprehension has come . . . a system of thought which makes reality very hard to reach."

Scientists invented the concept of race as an inherited trait that naturally produces and reproduces the racial order in which black people serve white masters. With this system of biosocial thought, scientists kept white people happy by helping them avoid the reality of their nation's origins in violence against black people.

EUGENICS AS BIOSOCIAL SCIENCE

Another biosocial science, closely related to the biological concept of race, emerged after the discovery of the gene. In 1911, prominent biologist

Charles Davenport defined eugenics as “the science of the improvement of the human race by better breeding.”²⁷ At the turn of the twentieth century, scientists proposed the rational control of reproduction to improve the population and advance society based on the premise that genes determine individuals’ socially relevant traits.²⁸ Eugenecists’ biosocial agenda, which spanned a broad range of public health, criminal justice, education, and immigration policies, confused social privilege with innate biological superiority, and social disadvantage with innate biological inferiority.

The founder of eugenics, Francis Galton, mistook inherited social privilege for inherited intelligence when he wrongly assumed that the British elite achieved their stature owing to their innate “genius.”²⁹ He argued that fitness in humans depended on “General Ability or Intelligence” and proposed “to show . . . that a man’s natural abilities are derived by inheritance.” Like the myth that racial caste is inherited, Galton’s claim that social class is inherited is a profound misapprehension that erases the reality of violently enforced structural inequality.

Galton’s distinction between nature and nurture laid the foundation for his biological theory of social class. By separating nature (the traits children are born with) from nurture (everything that influences children after they are born), Galton could claim that children’s social positions are determined by their inherited traits and not by the social structures that advantage or disadvantage them.³⁰ This imaginary break between nature and nurture permitted eugenicists to avoid the obvious empirical problem of controlling for the myriad impacts social inequality has on children’s experiences and life chances. As the “Geneticists Manifesto,” signed by twenty-two scientists and published in *Nature* in 1939, noted: “There can be no valid basis for estimating and comparing the intrinsic worth of different individuals, without economic and social conditions which provide approximately equal opportunities for all members of society instead of stratifying them from birth into classes with widely different privileges.”³¹ The make believe that scientists can isolate, test for, and quantify inherited propensities that determine success in an unequal society scaffolded eugenicists’ claim that social inequality originates in biology.

Galton’s eugenicist ideas found fertile ground in America. Eugenics became mainstream science in the United States before it was embraced as the biosocial logic of Nazi extermination.³² Like the biological concept of race, eugenics was politically useful to defend the white capitalist regime. In the early 1900s, the descendants of northern European settlers sought to maintain control over an exploited workforce of black sharecroppers in

the South and urban factory workers from southern and eastern Europe. Eugenics provided a forward-thinking scientific framework to justify the efforts of white elites to preserve the unjust social order they had violently erected.

White elites were also pathologically obsessed with preserving their racial purity, and eugenicist science went hand in hand with Jim Crow laws that officially segregated people by race.³³ Eugenics and Jim Crow, after all, were both progressive reforms that relied on modern biosocial science to strengthen the social order. On the same day in March 1924, the Virginia legislature enacted two laws that jointly promoted the state's eugenicist and white supremacist agendas.³⁴ Virginia's anti-miscegenation law, the Racial Integrity Act, prohibited anyone who wasn't white from marrying a white person, in order to discourage contamination of the white race and reserve the privileges of marriage to a white person only for white people.³⁵ That was the law the US Supreme Court held unconstitutional in its 1967 decision *Loving v. Virginia*.

Along with the Racial Integrity Act, Virginia lawmakers passed "An Act to provide for the sexual sterilization of inmates of state institutions in certain cases" that authorized the forced sterilization of people confined to government asylums because they were deemed "feeble-minded." The compulsory sterilization law was the subject of the 1927 case *Buck v. Bell*, in which Justice Oliver Wendell Holmes gave eugenicist science the imprimatur of constitutional law in his infamous declaration "Three generations of imbeciles are enough."³⁶

Like Samuel Cartwright's defense of slavery and the myth of the Happy Darkie, Justice Holmes's rationale for sterilizing Carrie Buck against her will relied on the pretense that the state's violation of her body was for her own good, as well as that of society. Holmes explained, "It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind."³⁷ Eugenicist science provided a biological explanation for Buck's disadvantaged status as one of the "shiftless, ignorant, and worthless class of antisocial whites of the South," to quote Harry Laughlin's deposition testimony in the case, and a biological excuse to forcibly contain her.³⁸ According to eugenicist thinking, forced sterilization protected society from the biological threat posed by genetically defective races and classes.

The biosocial logic of race and eugenics not only obscures the violence required to uphold structural inequality, it also converts those subjected

to state violence into biological threats to society. Frantz Fanon wrote in “The Negro and Psychopathology” that the “Negro symbolizes the biological danger. . . . To suffer from a phobia of Negroes is to be afraid of the biological.”³⁹

I recall Fanon’s words frequently these days when police officers routinely explain why they killed unarmed black victims by describing them as having threatening nonhuman bodies. The Charlotte, North Carolina, officer who shot twenty-four-year-old Jonathan Ferrell ten times as Ferrell approached him for help after his car crashed described him as a “zombie.”⁴⁰ Darren Wilson told the Ferguson grand jury investigating his killing of eighteen-year-old Michael Brown, “The only way I can describe it, it looks like a demon.”⁴¹

The notion that race is biologically reproduced makes black women’s wombs an especially dangerous biological threat. Politicians, policymakers, sociologists, demographers, public health experts, and the media cast black women’s fertility as an urgent social problem.⁴² They routinely point the finger at black women’s childbearing as the cause of their children’s disadvantages and deficits, and propose policies to restrict black women’s fertility as the remedy. Tens of thousands of black women across the country were sterilized without their freely given consent in the 1960s and 1970s as part of government programs that viewed their children as burdens on society.⁴³ The North Carolina Eugenics Board operated well into the 1970s, by then focusing the scalpel on black women who received public assistance.⁴⁴

A 1990 *Philadelphia Inquirer* editorial proposed Norplant, a long-acting chemical contraceptive, as the answer to the staggering rates of black child poverty.⁴⁵ And in 2013, the Center for Investigative Reporting revealed that 150 female inmates in California state prisons had been sterilized between 2006 and 2013 without obtaining required ethics approval. The doctor in charge justified sterilizing the incarcerated women by pointing to “what you save in welfare paying for these unwanted children—as they procreated more.”⁴⁶

In the 1990s, pundits turned to black mothers’ crack-cocaine use as a primary explanation for high rates of both black infant mortality and child poverty, although these disparities long predated the crack epidemic. Biomedical researchers falsely claimed that these women gave birth to so-called “crack babies” who lacked any social conscience and were destined to lives of welfare dependency, illiteracy, and crime.⁴⁷ Instead of transmitting immutable deficiencies through their genes, these mothers were said

to inflict similar damage in utero, dooming the next generation of black children to what one columnist described as “a life of certain suffering, of probable deviance, of permanent inferiority.”⁴⁸ The exact biological mechanism by which black mothers produced their children’s inferior status became irrelevant. Another reporter wrote, “Call them ‘welfare babies,’ ‘crack babies,’ or ‘deficit babies’—by whatever term, they constitute a new ‘bio-underclass’ of infants who are disadvantaged almost from the moment of conception.”⁴⁹

Since then, medical researchers have definitively discredited the crack-baby myth: the infants exposed to crack cocaine in utero have grown up, and are not the monsters they were predicted to be. The negative outcomes they exhibited as newborns, originally attributed to drugs, actually resulted from structural inequities experienced by all black mothers and children in their neighborhoods—lack of access to high-quality health care, shoddy housing, malnutrition, exposure to environmental toxins, and stress.⁵⁰ But the damage had been done: district attorneys across the country concocted an assortment of charges to punish these women for fetal crimes, and child welfare agencies removed thousands of babies from their mothers to warehouse in hospital wards.⁵¹ The state turned a public health problem into a criminal justice matter to be solved by locking up women instead of providing them with better health care.

In 2011, an antiabortion billboard campaign in cities across the country, including Atlanta, Chicago, and New York, literally reiterated the familiar message that black women’s wombs pose a biological threat.⁵² One proclaimed: “The most dangerous place for an African American is in the womb.” Ironically, the billboards exploited the history of reproductive abuse of black women by using rhetoric that comes straight from the eugenics era.

The old biosocial science casts only socially disadvantaged people—never those in power—as biological threats to society. Scientists tend to focus especially on black people as research subjects to investigate the innate predisposition for violence and other forms of antisocial behavior.⁵³ The atrocities white people have systematically inflicted on other human beings are far too numerous and horrific to recite. We need only recall the postcard image of tortured and burned bodies of black lynching victims hanging from trees as grinning white onlookers point up at them. Yet black scholars who propose to study the biological reasons for white people’s propensity to conquer, dehumanize, and brutalize others are considered crackpots. Black psychiatrist Frances Cress Welsing’s theory of “color confrontation,”

linking white people's urge to dominate others to a genetically defective lack of melanin, is considered illegitimate by mainstream biosocial scientists.⁵⁴ But why is her theory any less plausible a biological explanation for the racial order than those that rely on black genetic defectiveness?

THE LEGACY OF OLD BIOSOCIAL SCIENCE

The universal condemnation of the Nazi Holocaust put an end to mainstream support for eugenics, now seen as empirically and ethically flawed science. But eugenics' biosocial underpinning—the belief that social inequalities originate in biological differences—has survived. The Galton Foundation closed down the *Eugenics Review* in 1968 only to revive it as the *Journal of Biosocial Science* the following year.⁵⁵ The American Eugenics Society waited until 1973 to change its name to the Society for the Study of Social Biology.⁵⁶ Decade after decade, prominent scientists have used eugenicists' favorite measure of inherent worth—intelligence—to make biosocial claims. In the 1970s, Berkeley psychologist Arthur Jensen claimed that black students' innate cognitive inferiority limited the efficacy of federal education programs.⁵⁷ There was no point in spending tax dollars on improving education for black children, he argued, because they were innately incapable of greater academic achievement. The 1994 controversial bestseller *The Bell Curve: Intelligence and Class Structure in American Life*, by Richard J. Herrnstein and Charles Murray, rehashed the claim that race and class disparities stem from immutable differences in inherited cognitive ability, which could not be eliminated through social interventions.

Today, as biological and social scientists gain unprecedented access to research participants' genetic information, they are "revisiting" eugenicist claims about intelligence and linking specific genotypes to educational attainment.⁵⁸ A 2016 study in *Molecular Psychiatry* claimed its findings marked "a turning point in the social and behavioral sciences" because they make it possible "to predict educational achievement for individuals directly from their DNA."⁵⁹ The authors proposed that "polygenic scores may soon become a useful tool for early prediction and prevention of educational problems." These scientists are not using children's social positions to predict their intelligence or educational attainment, as eugenicists did. But they are using genetic tests to explain why socially disadvantaged children achieve less academically.

Unlike eugenicists, many researchers currently studying the genetics of intelligence argue their findings can help to reduce social inequality

by identifying which children need educational interventions the most.⁶⁰ Given the persistence of glaring race and class inequities in public education, however, it is far-fetched to believe our society would be motivated to devote *extra* rather than even *fewer* resources on children deemed by genetic tests to be innately predisposed to lower intelligence. We are more likely to address children's unequal educational attainment by distributing educational resources more equally, without reference to genetic testing.

World War II also brought the disavowal of scientific racism. UNESCO's landmark 1950 and 1951 "Statements on Race" rejected the Nazi doctrine that some races are superior to others, but they failed to abandon the concept of biological race altogether. Instead, scientists began to distinguish the ideological use of race for repressive purposes from the scientific use of race for legitimate research.⁶¹ Fifty years later, the mapping of the human genome seemed to herald once again the demise of the biological race concept when the project's lead scientists declared it proved race could not be identified in our genes. Yet the science that emerged from sequencing the human genome reflects an explosion of interest in race-based genetic variation.⁶²

In many labs, scientists use race as an unquestioned organizing principle for the collection, analysis, and reporting of genetic data with an astounding lack of scientific rigor, routinely confusing the latest socially determined Census categories for genetically determined biological groupings.⁶³ A study published in the *American Journal of Obstetrics & Gynecology* in 2007 attempted to test the hypothesis that "black race independent of other factors increases the risk of extreme preterm births."⁶⁴ It is hard to fathom what the researchers meant by black race and how they could have possibly isolated this ambiguous biological essence from the wide range of environmental factors that can cause women to deliver prematurely.

The revival of the biological race concept reached outside academic circles in 2014, when former *New York Times* science journalist Nicholas Wade published a manifesto in favor of race-based genetics.⁶⁵ In *A Troublesome Inheritance: Genes, Race, and Human History*, Wade claims the human species is divided into three principal races—Africans, Caucasians, and East Asians—that evolved separately to be genetically predisposed to distinctive social behaviors that, in turn, determined the types of institutions each race developed. According to Wade, Europeans evolved to create "open and innovative" societies, Jews are genetically adapted to behaviors required for economic success, Chinese people are programmed for conformity that makes them obedient to autocrats, and Africans remain mired

in their innate propensity for violent tribalism. For Wade, it is “instinctual social behaviors” that explain why resource-poor countries like Japan and Iceland are wealthy while more richly endowed countries like Nigeria and Haiti are “beset by persistent poverty and corruption.”⁶⁶ He is breathtakingly silent about the role of European conquest, slavery, and colonialism in producing these global inequities.

In several widely cited articles in prominent journals, biomedical researchers argued that it was essential to investigate health-related genetic differences among racial groups in order to treat the health problems of minority patients effectively and equitably.⁶⁷ These scientists distinguish their use of race as an inherited trait from its racist incarnations on the basis of their advanced methods and good intentions.⁶⁸ This defense assumes that race is a natural category that only becomes problematic in the hands of racists. But race is the product of racism; racism is not the product of race.⁶⁹

The problem with scientists’ misinterpretation of the political category as a biological one is that it helps to perpetuate the view that racial inequalities are caused by differences in biology rather than differences in power. The current revival of biological concepts of race mimics past deterministic explanations for racial inequality by making race seem more real at the molecular level than at the social level. Seeing race as an innate trait resolves the contradiction inherent in colorblind political ideology that claims racism has ceased to matter in our society while despicable racial gaps in health, wealth, and welfare are plain to see.⁷⁰ Yet again, in the words of Evelyn Hammonds, “The appeal of a story that links race to medical and scientific progress is in the way in which it naturalizes the social order in a racially stratified society such as ours.”⁷¹ Today, this scientific approach to race provides a soothing genetic explanation for the racial inequities that persist in a supposedly postracial society.

CONCLUSION

What is the relationship between biology and society? I have argued that the old biosocial science, exemplified by eugenics and the biological race concept, answers this question in a way that impedes justice. The old biosocial science is grounded in a profound misapprehension of the relationship between biology and social inequality.

Brazilian educator Paulo Freire observed in *Pedagogy of the Oppressed*, “Dehumanization, although a concrete historical fact, is not a given destiny but the result of an unjust order that engenders violence in the oppressors,

which in turn dehumanizes the oppressed.”⁷² Old biosocial scientists have explained the historical fact of dehumanization of oppressed people as a given destiny rather than the result of unjust power arrangements. This is not just an empirical error. It is an unethical one.

The old biosocial science separates nature from nurture in order to locate the origin of social inequality in inherited traits rather than imposed societal structures. It theorizes that social inequality is reproduced in the bodies—especially the wombs—of socially disadvantaged people rather than in the reinvention and reconstruction of unjust ideologies and institutions. It identifies the problems stemming from social inequality as oppressed people’s biological threats to society rather than as the structural impediments and state violence inflicted on oppressed people. And it addresses social problems by intervening in oppressed people’s bodies to fix their perceived biological deficits rather than ending the structural violence that dehumanizes them and maintains the unjust social order.

The abominable practices that ensued—forced sterilizations, medical experimentation, internments, and exterminations—stemmed not only from the bad intentions of the scientists who participated in them but also from the unethical logic of the science itself. The old biosocial science, to borrow again the words of James Baldwin, is a system of thought that makes the reality of social inequality and the violence that maintains it very hard to reach.

With that argument in mind, I close this lecture about the old biosocial science that holds that social inequality is caused by biological differences. In my second lecture, I discuss the new biosocial science that investigates how social inequality produces disparate biological outcomes. Is the new biosocial science a system of thinking that makes the reality of social inequality easier or harder to reach?

NOTES

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2. J. Anthony Stallins et al., “Geography and Postgenomics: How Space and Place Are the New DNA,” *GeoJournal* (2016); Aaron Panofsky, *Misbehaving Science* (Chicago: University of Chicago Press, 2014); Hannah Landecker and Aaron Panofsky, “From Social Structure to Gene Regulation, and Back: A Critical Introduction to Environmental Epigenetics for Sociology,” *Annual Review of Sociology* 39.1 (2013): 333–57; Evelyn Fox Keller, *The Century of the Gene* (Cambridge, MA: Harvard University Press, 2014).
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LECTURE II. THE NEW BIOSOCIAL AND THE ETHICAL FUTURE OF SCIENCE

INTRODUCTION

As some scientists continue to study the biological origins of social inequality, an emerging scientific paradigm investigates instead how unequal social environments produce disparate biological outcomes. Rather than explain the social order as biologically determined, these scientists show how the social order gets biologically embedded.¹ The new biosocial science has been heralded as a revolution that will radically change policies addressing social inequality. In my second lecture, I consider whether or not this biosocial revolution radically corrects the ethical flaws of the old biosocial science. What is the potential for this paradigm shift to move us toward an ethical future for science by helping to transform the way we think about biology, society, and justice?

While the old biosocial science relies on separating nature from nurture, the new relies on merging them. The old biosocial science carefully compartmentalizes life's hereditary contributions from their environmental contexts. The new biosocial science is exploding this boundary. There is no natural body that is born without social influence. It is impossible to isolate anyone's innate qualities from the qualities that are shaped by the social environment. Every single biological element and process in the human body is affected by society. All life is at once biological and social.²

This change in perspective occurred in large part because scientists realized that the gene is not omnipotent. Not only do genes not determine social status; they don't determine anything. Scientists discovered that biochemical mechanisms actually govern how the genome of every cell of an organism is expressed by regulating how genes are turned on or off in response to environmental cues, without changing the structure of the genes themselves.³ Genetic variation does not cause even a fraction of differing phenotypes, whether height or depression or intelligence; rather, genetic variation alters responses to particular environmental signals—so it cannot be measured separately from those signals. Feminist physicist Evelyn Fox Keller now sees the genome as a “reactive system.”⁴

Similarly, neuroscientists now see the brain as a social as much as a biological organ that, like our genomes, is constantly responding to environmental influences. The brain isn't hardwired either; it's plastic—it has

the ability to modify itself biologically in response to social experiences throughout the lifespan.⁵ Epigenetics and social neuroscience tell us that biology is not a separate entity that interacts with the environment; as Fox Keller puts it, “Biology itself is constituted by those interactions.”⁶

What does this change in perspective mean for the relationship between biology and social inequality, in particular? The environment studied by biosocial scientists includes a wide range of influences, from what you eat to the toxins you breathe to the neighborhood you live in to how nurturing your parents were to the discrimination you experience—in other words, all of the social world.⁷ The social world, in turn, is ordered according to the political hierarchies of race, gender, class, and disability that structure individuals’ experiences and opportunities. Even exposure to physical substances like chemical toxins is governed by social status.⁸ Think of the crisis caused by lead-contaminated water in Flint, Michigan, that poisoned mainly low-income black families.⁹

Harvard sociologists Robert Sampson and Alix Winter graphically showed the racial ecology of lead poisoning by empirically mapping the link between the spatial isolation of African Americans in segregated neighborhoods and the prevalence of lead poisoning in Chicago.¹⁰ Using the term “toxic inequality,” they confirm what black activists have charged as environmental racism for decades: predominantly black neighborhoods comprise the vast majority of neighborhoods in the top quintile of Chicago’s lead toxicity rates in each year, from 1996 through 2012. Flint, Michigan, they conclude “is not an aberration.” Lead poisoning of black children is “a form of biosocial stratification.”

It has long been established that the way society is organized drives group disparities in well-being. The best predictor of health is an individual’s position in the social hierarchy.¹¹ The new biosocial science illuminates this knowledge by unveiling biological consequences of social inequality at the molecular level and explaining the biological pathways through which social inequality gets embodied. But how does this new knowledge advance the ethical aims of science—to equip us better to end the social injustices scientists are illuminating? Does probing the level of cells and brains move us toward or away from undoing arrangements of power that order people’s well-being? When does it force us to confront the reality of social inequality and when does it make this reality harder to reach?

Unlike the old biosocial paradigm, the new biosocial paradigm has the potential to advance justice because it starts from the premise that social inequality is not natural. However, this potential can be stymied when

some scientists import old biosocial assumptions and frameworks into the new biosocial science. An ethical future for science can only be assured if biosocial scientists participate in a radical transformation of the relationship between biology, society, and justice.

THE NEW BIOSOCIAL SCIENCE'S RADICAL POTENTIAL

I see a lot of potential in the new biosocial paradigm to promote justice. Epigenetics first piqued my interest when I was writing a book on the resurgence of biological concepts of race in genomic and biomedical research.¹² I pointed to epigenetic mechanisms to explain the social causes of racial disparities in health that had been misconstrued as genetic differences. The old biosocial paradigm claims that racial gaps in health are evidence of genetically distinct races and explains these gaps as the result of genetic differences. The new biosocial paradigm refutes this logic. Race is not a biological category that naturally produces health disparities because of innate differences. Race is a political category that has staggering biological consequences because of the impact of social inequality on people's health.¹³

Biosocial scientists are now uncovering the biological pathways through which inequities in wealth, housing, and education, along with experiences of stigma and discrimination, translate to disparate health outcomes.¹⁴ For example, epigenetics may explain why African Americans have higher rates of low birth weight *and* adult cardiovascular disease—health disparities commonly thought to result from peculiar genetic predispositions. Scientists suspect that stress and discrimination experienced by black mothers throughout their lives and during pregnancy cause them to have smaller babies who, partly because of epigenetic responses to the socially patterned environment in the womb, have an elevated risk for heart problems when they grow up.¹⁵

You might excuse old biosocial scientists for being fooled by these epigenetic mechanisms into seeing genetic causes that don't exist. But W. E. B. DuBois had this new perspective when he wrote *The Philadelphia Negro* in 1899 and quipped: "Particularly with regard to consumption it must be remembered that the Negroes are not the first people who have been claimed as its particular victims; the Irish were once thought to be doomed by that disease—but that was when Irishmen were unpopular."¹⁶ Freed from the preposterous belief that racial inequality is caused by innate differences in biologically distinct races, scientists can apply a

more plausible biosocial framework to understand how structural racism produces health inequities.

In addition to offering a non-hereditarian explanation for the relationship between biology and social inequality, the new biosocial science highlights the devastating corporeal consequences of an unjust social order. By theorizing innate difference as the cause of social structure, the old biosocial science portrayed socially disadvantaged people as biological threats to society. Biology served as a justification to blame their defective bodies for social problems rather than blame society for their suffering.

The new biosocial model more ethically frames biological disparities as the costs of social inequality that are unjustly borne by socially disadvantaged groups. Measuring cortisol levels of African American and Latino adolescents as they are experiencing discrimination shows that these daily microaggressions that have been dismissed as benign actually have biological consequences that gravely damage their health.¹⁷ Neuroscientists are revealing that social and economic deprivation can negatively affect brain development.¹⁸ Understanding better how unequal social structures inflict biological harms can garner more concern about inequality and discrimination, and facilitate more effective policies for structural change.¹⁹

Seeing more clearly social inequality's biological toll could potentially bolster activism seeking to end the toxic conditions that produce these injuries. A leading social neuroscientist explains, "This may renew and expand our sense of societal obligation to poor children by reframing the problem as more than mere educational and economic opportunity, extending to the physical integrity of children."²⁰ If the injustice of unequal educational and economic opportunities is too nebulous to spur the public to action, perhaps seeing the physical consequences of social deprivation etched on children's bodies will.

A third ethical improvement of the new biosocial science is its focus on plasticity. Unlike immutable genes that were claimed to inescapably create the unequal social order, the biological effects of social inequality are reversible. Some new biosocial scientists stress that, while social inequality can have "durable" effects on biology, "'durable' need not equate with 'permanent.'"²¹ Because of the plasticity of the epigenome and brain structure, bodies injured at an early age by social deprivation can be helped later in life by interventions that reverse the damaging biological processes. More important, we can prevent these injuries from occurring again by ending the unjust environments that caused them.

IMPORTING OLD MODELS INTO NEW SCIENCE

Yet the new biosocial research has not been consistently revolutionary in practice.

The first impediment is in the research design of many studies: their biosocial model centers on the biological fitness of socially disadvantaged people to cope with their harmful environments.²² How do new biosocial scientists arrive at a standpoint that is remarkably similar to that of the old biosocial approach? To fit social facts into a biological framework, some scientists convert social inequality into a series of deleterious environmental exposures.²³ The basic research question is then formulated as: How does the body's internal chemistry—measured by biomarkers or brain scans—respond to the research subject's exposure to adverse environmental signals?

The social order already begins to fade from the model as attention is focused on biochemical responses within the body rather than on the inequitable social structures the body is responding to. *Exposure* to harm directs our thinking differently than *infliction* of harm. The scientists' aim is no longer to understand how unequal power arrangements inflict biological injuries. Their aim becomes to evaluate individuals' biological fitness to withstand exposure to unequal social environments.

In analyzing biological fitness, some new biosocial scientists import old biological concepts of race, gender, and class differences into their research designs. These scientists measure racial differences in biochemical responses to environmental exposures and treat some groups as innately more vulnerable to adverse exposures than others. A team of developmental psychologists who found African American children in their study had higher cortisol levels than white children speculated the disparity might stem from "possible preexisting differences . . . related to genetic background and to epigenetic processes of development."²⁴ A 2016 study compared epigenetic biomarkers that predict aging (the so-called "epigenetic clock") in seven different racial/ethnic groups to explain racial gaps in mortality rates.²⁵ A leading scientist in the field writes, "Epigenetic responses are sensitive to the differences between men and women, between different social classes and between different ethnic communities."²⁶

At the same time, social neuroscientists are studying the cognitive consequences of the biological damage social deprivation does to children's brains. Using combined cognitive and neural tests, they claim that the brains of poor children have a distinctive neural pattern that places them at risk of impaired language and executive function systems.²⁷ Some of these neuroscientists are investigating the association between children's

socioeconomic status and brain function to theorize the neurocognitive pathways between child poverty and lower academic achievement.²⁸ One prominent theory is that the stress children experience from living in poverty increases the production of damaging stress hormones. These hormonal responses, in turn, cause a host of conditions that hamper learning—cognitive disabilities, psychological disorders, impaired self-regulation of behavior, and lower IQ.²⁹

Recently, neuroscientists began looking at the brain itself to detect the impact of poverty on structural brain development.³⁰ Brain volume and cortical thickness can show up as amounts of brain surface gray matter in magnetic resonance imaging (MRI). A 2015 study, for example, found that children from the poorest families showed the least amount of gray matter in relevant parts of the brain and scored lowest on standardized tests.³¹ The researchers concluded that structural differences in brain development may explain 20 percent of the academic achievement gap for these children. Another 2015 study concluded that income was logarithmically associated with brain surface area.³²

These projects extend the inquiry from investigating poverty's biological harms to children to explaining the biological mechanisms that make poor children less successful in school. A major neuroscience study sought to address the problem that "children who grow up in poverty tend to have lower IQs and academic achievement scores and are less likely to develop basic reading and mathematics proficiency than their higher-SES [socioeconomic status] counterparts."³³ The aim of their research, the scientists wrote, was to use "[t]he methods of cognitive neuroscience, such as neuropsychological testing and structural brain imaging" to "help to identify specific neurocognitive systems that vary along socioeconomic gradients." The investigators turned to the underlying neurocognitive systems that "mediate the association between SES and cognitive performance" because those "provide possible targets for interventions designed to reduce SES disparities." Note that the researchers aimed to show much more than poverty's negative effects on the brain; they aimed to explain and address socioeconomic disparities by focusing on differences in brain function.

One of the cognitive neuroscientists who pioneered these brain development studies explained that she became interested in the topic after wondering why her babysitters' children fared so much worse than her own daughter. Although they started life with the same potential as her daughter, she stated, "somehow they found their ways onto a different kind of life trajectory: toward lower achievement and fewer options in life."³⁴

She speculated that poverty may have shaped the babysitters' children's brains in a way that made it difficult to escape their mothers' social status. In other words, she hypothesized that the reason her babysitters' children ended up in a more socially disadvantaged position than her daughter had to do with differences in brain development.

A recent *Newsweek* article, "How Poverty Affects the Brain," reflects this shift in focus from structural to neurocognitive impediments to explain the reproduction of social status. Summarizing recent neuroscience of poverty studies, the author writes: "Housing discrimination against minorities living in unsafe, dilapidated buildings, implicit racial bias by teachers, malnutrition, and underfunded schools in poor communities can hamper normal brain development. All of these factors combined can make learning nearly impossible and influence why African-Americans, for example, are more likely than whites to be entrapped in poverty."³⁵ Like the model of epigenetically induced deficiencies, this social neuroscience model theorizes damaged brain function as the biological conduit that transfers structural inequities into lower educational achievement. According to the model, this biosocial process traps poor black children in their lower social status because it impairs the cognitive capacities that would enable them to achieve at the levels of white middle-class and affluent children.

True, social neuroscientists reject the old biosocial view that poverty persists because poor children inherit genetic traits that predispose them to lower intelligence. But the new biosocial models can share with the old biosocial models the false assumption that poor children's lower educational attainment—and their resultant inability to escape poverty—are determined by deficits inside children's bodies. By detouring through the brain, this model can obscure how multiple forms of discrimination directly and systematically deny opportunities to poor children, especially poor black children.

For some epigenetic and neuroscience researchers, social structure serves as the backdrop for more salient questions about the biological capacities of socially disadvantaged people to respond to social inequality—though they theorize that these biological capacities are shaped by social structure. This is where some scientists take a wrong turn: they are now focusing on developmental deficiencies—not structural barriers—to explain what prevents oppressed people from escaping their disadvantaged position in an unjust social order.

Though beginning from radically different starting points, old and new biosocial scientists can reach a remarkably similar destination—explaining

the persistence of social inequality as a product of flaws in people's bodies rather than flaws in our society.

This wrong turn is exacerbated in new biosocial models that conceive of socially induced biological deficits as heritable. Some scientists theorize that the biological harms caused by social deprivation can be passed down from generation to generation and mire individuals in the unequal social environments where they were conceived. Once researchers disconnect biological effects from their social origins, the plasticity of the brain and epigenome can turn into a stable inheritance.

For some researchers, the very definition of epigenetics centers on the durability of biochemical markings that can be transmitted across generations—often referred to as long-lasting biological memories of past social exposures.³⁶ Scientists are finding that stressful or traumatic experiences can have long-term detrimental effects at the cellular level as a result of epigenetic mechanisms. As I mentioned above, epigenetic markings in a fetus triggered by its uterine surroundings can produce health problems in adulthood. What's more, prenatal exposure to environmental factors can affect not only the fetus's lifelong health, but also that of future generations because the epigenetic influences on the fetus will also influence that individual's future offspring. Thus, scientists have extended the theory of inherited biochemical changes *within the cells of the organism* over its lifetime to a theory of inherited biochemical changes *across generations of organisms*.³⁷

In one model, this process occurs *intergenerationally* when offspring are exposed to epigenetic influences as gametes through nongenetic factors in egg or sperm, as fetuses during gestation, or as newborns through the caretaking they receive. A more controversial and unproven model claims this process occurs *transgenerationally* through modification of the offspring's germline epigenome—the full set of epigenetic markings—that is then stably inherited by future generations.³⁸

Some biosocial scientists go on to theorize that the biological consequences of adverse environments are not only durable but also self-sustaining. One text defines epigenetic changes as “alterations in gene expression that are self-perpetuating in the absence of the original signal that caused them.”³⁹ Scientists have noted the implications of this concept of self-sustaining epigenetic effects for how we think about unequal social environments. One epigeneticist writes, “If, for example, long-lasting ethnic conflicts, starvation, or a persistently low socioeconomic status can induce detrimental cognitive and emotional effects in members of human

populations, it could aggravate and reinforce social problems for generations to come, because the epigenetic changes may lead to the reconstruction of the deleterious phenotypes.”⁴⁰ In contrast to the biological effects of a toxic environment that persist only as long as the toxin is consumed, the effects of a toxin consumed in one generation may last for many generations by “inducing an internal self-reconstructing epigenetic state,” even if the original toxic inducer is no longer present.⁴¹ This suggests that the harmful biological effects of social inequality can reconstruct themselves epigenetically even in the absence of the social environment that originally triggered them.

Social neuroscientists are developing a similar model of self-perpetuating biological harm: “We’re starting to get an appreciation of the richness of the social story—the social stress of poverty that is really driving these kinds of effects and shaping brain development and biological development in ways that we think are going to persist through a lifetime,” a leading scientist in the field told *Newsweek*.⁴²

This model treats the self-sustaining biological mechanisms as more significant than the original social triggers in driving the persistence of the unequal social order. Because the biological effects continue past the social events that caused them, the present unjust social order—and the oppressive mechanisms that sustain it—seem to disappear into the ether.⁴³ Like old biosocial scientists who mistook plastic epigenomes for stable genes, some new biosocial scientists mistake current practices of discrimination, exploitation, and state violence for the self-perpetuating biological deficits of their victims.⁴⁴ The reason the unjust social order persists is not because socially disadvantaged people are biologically incapable of escaping it. It is maintained by structural forces imposed on them by people in power.⁴⁵ Many new biosocial studies not only fail to factor this structural violence into their research designs, their research designs affirmatively obfuscate it.

Most black Americans living today are hindered both by a legacy of slavery and Jim Crow that lasted until the 1960s, and by current systems and institutions such as racial profiling by police, hyper incarceration, employment and housing discrimination, and poor-quality education and health care that continue to keep them in a subordinated status.⁴⁶ All of these forces are concentrated in predominantly black neighborhoods whose residents at this moment are subjected to government and market-backed deprivations and assaults. Many Americans were shocked to learn in 2015 that black residents of Ferguson, Missouri, were systematically and routinely arrested, charged exorbitant fines, and jailed in a deliberate

scheme to fund city government.⁴⁷ This outrageous practice is but one component of a larger law enforcement system that criminalizes whole communities independent of individuals' guilt or innocence in order to keep them under state control.⁴⁸

Many of these structural forces are aimed directly at black children. Black boys and girls are expelled from school and detained in the juvenile justice system at far higher rates than white children for similar offenses.⁴⁹ Fines, fees, and restitution mandates levied on children in the juvenile justice system in every state impose a crushing financial burden on families long after the children's probation has ended.⁵⁰ Because these monetary sanctions are most onerous for poor families, they have created a two-tiered system of justice in which poor black children are not only subjected to more aggressive policing but more aggressive punishment than white middle-class children—a punishment that prevents many of them from attaining the educational achievement that might give them a chance for social advancement.⁵¹

The *Newsweek* article on the neuroscience of poverty displays two large photos of students at Los Angeles high schools. In one, a police officer is taking two handcuffed students into custody for truancy.⁵² In the second, students are standing in a long line that extends far outside the school entrance. They are waiting to be scanned by a metal detector as police officers exit the building after a “long morning of monitoring student activity.” The caption explains, “Schools that can feel like prisons because of barred windows, security checks and lockdowns increase the anxiety level of many students and can make learning nearly impossible.”

The neuroscience studies the article describes suggest that the reason these children cannot learn is their deficient brain function that results from these traumatic experiences with school surveillance. But excessive surveillance in predominantly black schools directly prevents learning because it disrupts children's education, both by limiting the amount and quality of learning and by leading to higher rates of suspensions, expulsions, and detentions.⁵³ A recent survey found that, in schools where students of color accounted for more than half of the student body, the probability of using metal detectors, school police, security guards, locked gates, and random sweeps was two to eighteen times greater than in schools where the white student population was more than 80 percent.⁵⁴

I imagined the students in the second photo were lining up for another kind of surveillance—MRIs that neuroscientists had set up to scan their brains for the biological damage the police monitoring inflicted.

In contrast, the police in the photo are seen leaving the school building scot-free.

WHICH INTERVENTIONS?

Some new biosocial scientists have proposed social policy remedies, such as tax credits and housing vouchers, that directly reduce socioeconomic disparities.⁵⁵ However, when the new biosocial model converts structural violence imposed on socially disadvantaged people into biological deficits, the remedies it generates tend to be therapies to treat their bodies and behaviors rather than actions to remove structural impediments. According to proposals by two prominent figures in the epigenetics of social inequality, research on “persistent, socially induced deleterious effects that . . . reconstruc[t] similar conditions in descendants” creates “an urgent need to understand how to manipulate the developmental system and neutralize or reverse those effects.”⁵⁶

Another writes: “Epigenetic markings are potentially reversed by pharmacological interventions. Moreover, if social environments could impact epigenetic programs in the first place, they might also be reversed by behavioral intervention.” He adds: “The possibility that behavioral intervention could have biochemical consequences is extremely provocative, and might be a paradigm shift in the social sciences.”⁵⁷ It appears the paradigm shift he refers to is toward intervening in the bodies and behaviors of socially disadvantaged people rather than in the unequal social conditions many social scientists have previously targeted.⁵⁸

Similarly, some social neuroscientists are focusing on “coping mechanisms” that will help socially disadvantaged children buffer their brains from the stresses of social deprivation. This research agenda may direct policy interventions toward helping socially disadvantaged people deal better with discrimination without having to address the discrimination itself.

In new biosocial theories, the pathway between unequal social environments and deleterious biological outcomes often centers on mothers’ bodies and behaviors. Epigeneticists treat the womb as an “epigenetic vector,” as Sarah Richardson calls it—the conduit of past environments that are transmitted via biochemical mechanisms to the fetus.⁵⁹ They have identified women’s nutrition and stress levels while pregnant and nurturing behavior toward their newborns as key influences. According to these researchers, the womb is the place where our pliable genomes are most vulnerable to environmental exposures, where the self-sustaining loop of biochemical transmission initiates.⁶⁰

As we saw with the old biosocial science, framing the persistence of social inequality as a reproductive process spotlights women's bodies as sites of intervention and blame. Both epigenetics and social neuroscience conceptualize a narrow window of opportunity to intervene, prenatally or postnatally, before children's biological capacities are set. It becomes urgent to change mothers' behaviors for the sake of their children in order to forestall the impending biological emergency.⁶¹ Because the brain and epigenome are viewed as temporarily plastic during gestation and infancy but more stable later in life, mothers are held responsible for ensuring they do not transmit molecular damage to future generations.

In summing up the policy direction indicated by the neuroscience of poverty, the *Newsweek* article suggested: "New programs would focus not just on the children but also on the mother who grew up in poverty and as a result hasn't developed coping skills and is therefore highly unlikely to be passing them on to her children."⁶² How easily responsibility jumps from economic deprivation to the mother's deficient and seemingly inherited capacities, making her in need of supervision. This theory assumes that, rather than being experts in coping skills because of their experiences living in poverty, poor mothers haven't developed these skills because of their own socially induced cognitive incapacities.

One might ask why researchers cannot pursue both strategies at once—working to end the social structures that trigger detrimental biological outcomes while simultaneously alleviating the biological damage that results? I noted that the 2016 recipients of the Heinz Award included legal scholar and activist Michelle Alexander, the author of *The New Jim Crow*, who has illuminated how mass incarceration systematically subjugates African Americans, and physician Nadine Burke Harris, who created the Center for Youth Wellness to heal the impacts of toxic stress on children growing up in poor neighborhoods. Both women are admirably dedicated to using their expertise to tackle the causes and effects of racial injustice.

By contrast, the biosocial models I have discussed are constructed to attribute the poor health, juvenile justice involvement, and low educational attainment of socially disadvantaged children to their self-sustaining biological deficits. Once the biological threat is located in children's bodies, it is easier to explain intervention in them as a benefit to society. One biosocial research team notes: "Cost-benefit assessments of effective early childhood intervention for low-income children have documented significant financial returns to society through greater economic productivity, decreased welfare dependence, and lower rates of incarceration."⁶³ This

cost-benefit analysis shifts the moral focus from what is owed victims of structural violence to what they are costing society. The director of a child psychology research lab points out, “If you talk about something being a social justice issue, it doesn’t always get people’s attention,” but when viewed as a biomedical problem, “it is literally changing and retarding biological development. And the cost of that to our society is huge.”⁶⁴ Research motivated by concern about socially disadvantaged children that obscures the structural impediments and violence that deny their equal humanity and life chances risks supporting harsh policies aimed at regulating them rather than dismantling unjust social structures, systems, and institutions.

This biosocial model also hides the way structural forces privilege people at the top, as well as their accountability for helping to maintain an unjust social order. In his book *Evicted: Poverty and Profit in the American City*, Princeton sociologist Matthew Desmond criticizes views of inequality that treat low-income families as if they live in quarantine, cut off from the rest of society.⁶⁵ Instead he proposes a relational account of poverty that includes the way rich people wield influence over poor communities. Desmond points out that poverty is not just a product of low incomes, let alone poor people’s biological capacities; it is a product of the market exploitation of poor people that relies on unfair government support of wealthier people, such as housing, real estate, and tax laws that protect profiteering landlords. The vast majority of biosocial research focuses on biological pathologies of poverty and disadvantage rather than on social pathologies of wealth and privilege.

I sit at a table with scientists discussing research on the biosocial origins of antisocial behavior in African American children that one researcher says explains why these children are at high risk of committing crimes. His project merges biological and sociological perspectives to hypothesize that living in “bad neighborhoods” negatively affects black children’s cognitive functioning, making it harder for them to behave in socially acceptable ways and to obey the law. I challenge the premise that black children are more likely to be placed in juvenile detention because of black children’s socially induced biological predisposition to bad behavior. “Why not study white middle-class children’s antisocial behavior?” I ask. The scientists at the table address me in unison: “What’s wrong with studying the children who need our intervention the most? If we can use this research to develop a therapy for African American children’s antisocial behavior, isn’t that a good thing?”

What's wrong is the misapprehension underlying this type of research that makes African American children's reality harder to reach—the assumption that these studies apply an objective standard for antisocial behavior, neutral tools to identify it, and unbiased methods to measure it. That the reason African American children are more likely to be involved in the juvenile justice system is because of their higher rates of antisocial behavior. That a pharmaceutical therapy for antisocial behavior in African American children can remedy the racial gap in juvenile justice involvement. And that the reason white middle-class children are rarely involved in the juvenile justice system is because of their superior executive functioning. All of these assumptions overlook the reality of structural discrimination that unjustly targets black children for, and protects white children from, arrest and detention.

INTEGRATING BIOLOGICAL AND SOCIAL SCIENCES

This merger of faulty social and biological assumptions makes me question the growing interdisciplinary enterprise between biologists and social scientists that has accompanied the emergence of new biosocial perspectives. As I suggested earlier, these collaborations hold promise for a more ethical scientific study of biology's relationship to society.⁶⁶ If biology was split from sociology to support the unethical view of nature as inherited apart from social influences, then reintegrating these disciplines has the potential to correct that view. On one hand, social-scientific frameworks and methods by themselves cannot comprehend fully the interactions between biology and politics. On the other, biology is inadequate to explain the political regulation of life. Interdisciplinary engagement, therefore, holds promise for developing a transformative way of understanding the relationship between biology, society, and justice. In this way, biosocial science might contribute to envisioning human life in more humane, equitable, and just societies.

Yet these interdisciplinary collaborations are not necessarily transformative. Adding a sociological component seems to make biological research more socially relevant while biomarkers appear to add precision to traditional sociological methods. Simply put, biology makes social science seem, well, more scientific.⁶⁷ But this improvement often reduces the social order to biological processes, reinforcing rather than contesting the flawed assumptions and blind spots of both sciences.⁶⁸

Pharmaceutical and technological cures that intervene in the epigenome and brain cast an alluring spell because they are lucrative, quick,

and popular ways to translate laboratory studies into clinical applications, further steering the interdisciplinary enterprise in a biological direction. Given fierce competition for private and government funding, the new biosocial model offers an innovative pitch to keep research dollars streaming toward biological agendas even after the failure of lavishly funded genetic research to deliver its promised breakthroughs.⁶⁹

Some scientists defend against ethical scrutiny of these tendencies by positioning criticism of biosocial science in a disciplinary battle between biological and sociological perspectives.⁷⁰ They cast concerns about the persistence of biological explanations of social inequality as ideological threats to advancing scientific knowledge. This objection to ethical scrutiny of biosocial science, however, relies on the naïve belief that biological science is less vulnerable to political influence than social science, and it overlooks the ways in which some biosocial models obscure social realities.

TOWARD AN ETHICAL FUTURE

The new biosocial science is an emerging field. We still have the opportunity to tap its revolutionary potential to help create an ethical future for science. How can the radical realization that social inequality is not a fact of nature but has biological consequences help put the reality of social injustice within reach? How can this knowledge help to dismantle unjust social structures rather than reinforce them? Achieving these ends requires a collaborative project that does more than combine biological and social variables in existing research frameworks. It must aim at transforming both biological and sociological thinking through open and critical exchange in order to envision a new relationship between biology, society, and justice.

Transformative collaborations between biological and social scientists must figure out research designs that always keep unjust social structures and state violence in view, and not let their gaze on biological mechanisms obscure these social realities. Instead of a self-perpetuating biological deficit model, plasticity can give hope for positive outcomes that result from removing structural impediments and stopping state violence. Rather than using plasticity as a justification for intervening in the bodies of socially disadvantaged people, a new biosocial science would use it to explore the structural transformations needed to improve life for everyone. Why not translate the plasticity of our epigenomes and brains that allows our bodies to transform themselves into imagining transformation of our social order?⁷¹

Including lead toxicity in sociological theorizing about residential segregation, for example, led researchers to call for policies addressing

“landlord neglect of private housing conditions and institutional neglect of the indoor environments of daycare centers and schools,” and for “neighborhood reinvestment” and “city infrastructure projects.”⁷² A recent review of evidence that structural racism harms health and creates health inequities proposed a number of interventions involving community redevelopment, criminal justice reform, and training health professionals to be more structurally competent.⁷³

It is doubtful that mainstream biosocial science, conceived as an interdisciplinary collaboration of biological and social scientists alone, will be able to do this work. Biosocial scientists need to collaborate with people in the humanities as well, especially critical feminist, intersectionality, race, queer, and disability theorists.⁷⁴ Critical theorists have pointed out long before the current biosocial trend that what scientists have perceived as biological deficits are products of structural injustice and qualities that are devalued for social reasons.

The Combahee River Collective was a group of black lesbian feminists who met in the 1970s to, in their words, “actively . . . struggl[e] against racial, sexual, heterosexual, and class oppression” by “developing an integrated analysis and practice based upon the fact that the major systems of oppression are interlocking.”⁷⁵ They conceived embodiment in political terms when they wrote in their 1977 statement: “Black women have always *embodied*, if only in their physical manifestation, an adversary stance to white male rule and have actively resisted its inroads upon them and their communities in both dramatic and subtle ways.” In their paradigm, embodiment entails not only being exposed to adverse social environments but also, more importantly, being bodily positioned in relation to unjust power arrangements.

Black feminists have used speculative fiction to depict the experience of black people in a just world in which their power, creativity, and agency—and not their pathology—rule supreme.⁷⁶ English professor Esther Jones urges us to see black women’s science fiction “not as untenable, fantastical and absurd proxy for factual science; but rather, that it be appreciated for its capacity to explore questions of social justice in the realms of medicine and social policy by challenging our conceptions of human identity and behavior.”⁷⁷ Perhaps biosocial scientists can turn to black women’s science fiction to help them imagine new research models that no longer pathologize the bodies of oppressed people in lieu of dismantling unjust social structures.

Achieving this vision also requires including oppressed people in biosocial research in meaningful ways, not only as the subjects of study but also

for their input in research questions, designs, and methods. They should also have the means to participate more broadly in public debates about what is important to study.⁷⁸

Biosocial scientists are investigating the causes and consequences of social inequality. Their findings will have a profound impact on our understanding of how injustice in our society operates. Biological and social scientists must collaborate in more egalitarian ways and also include critical perspectives on how to move beyond well-worn and failed frameworks to achieve a more humane society. As the great science fiction author Octavia Butler wrote, “There is nothing new under the sun, but there are new suns.”⁷⁹ In striving for new suns, we might begin to envision truly new biosocial sciences that help to revolutionize not only how we see the interaction between biology and society but also how we liberate the interaction between human beings.

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