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Sana Saboowala

*University of Illinois at Urbana-Champaign*

Maria Cox

*University of Illinois at Urbana-Champaign*

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# Perspectives in Embodiment Theory

Sana Saboowala<sup>1\*</sup> and Maria Cox<sup>1\*</sup>

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<sup>1</sup> University of Illinois Urbana-Champaign, Integrative Biology Department

\*Corresponding authors:

Sana Saboowala, University of Illinois Urbana-Champaign, Integrative Biology Department, Davenport Hall 607 S Mathews Ave, Urbana, IL 61801. E-mail: [sanas4@illinois.edu](mailto:sanas4@illinois.edu)

Maria L. Cox, University of Illinois Urbana-Champaign, Integrative Biology Department, Davenport Hall 607 S Mathews Ave, Urbana, IL 61801. E-mail: [mlcox3@illinois.edu](mailto:mlcox3@illinois.edu)

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Researchers apply the concept of embodiment across many disciplines, resulting in a set of expansive definitions that only sometimes overlap. This special issue celebrates the plurality and wide applicability of this useful framework by bringing together multiple perspectives on embodiment within the field of human biology.

In biology and public health, we often turn to Nancy Krieger's 2005 definition of embodiment as "a concept referring to how we literally incorporate, biologically, the material and social world in which we live, from in utero to death" (Krieger, 2005). Similarly, in cultural anthropology, embodiment is viewed as the process of a person or group incorporating, internalizing, and reproducing the material and sociocultural world around them (Csordas, 1990; Kimmel, 2008). In this special issue we aim to bring these definitions together, highlighting the fact that disciplines engage with embodiment in unique ways that do not have to be incommensurable.

The manufactured incommensurability between the biological and sociocultural definitions of embodiment has prevented a systems-level analysis of the ways the body, culture, and society interact. Although research has taken strides through biocultural approaches and science studies (Wiley and Cullin, 2016; Hoke and Schell, 2020; Cabana, Mendoza, Smith, et al., 2022), disciplinary silos still prevail. We see this in academic work; for example, bioethics, engineering ethics, religious ethics, and philosophical ethics are separate courses, concepts, and fields (McGraw and Biesecker, 2014). The impacts of these silos, however, affect larger society.

Embodiment, at its core, is about the relationship between the body and the world. The

importance of interconnection between the two has never been more apparent, as policies around the world cause measurable biological damage. The COVID-19 pandemic provides a clear example of this phenomenon. Public health masking and social distancing policies have become increasingly politicized (Scoville, McCumber, Amironesei, et al., 2022; A. B. C. News, 2024.) and the effects of long COVID continue to be ignored (Knight, Mackintosh, Hudson, et al., 2023; Puspita and Mcgiani, 2023). The COVID-19 pandemic demonstrated sociologist and disability activist Irving Zola's point that we all "will at some point suffer from at least one or more chronic diseases and be disabled, temporarily or permanently...All of us must contend with our continuing and inevitable vulnerability" (Zola, 1983). The interplay between individual experiences and global systems is currently impacting society in a hypervisible way.

Although important research continues on these topics, conversations between spheres of study and influence are still sparse. Critical theorists, scientists, politicians, and educators do not connect with each other nor do they frequently engage with each other's work. This separation makes it difficult for new approaches to progress and allows systemic issues to prevail (McGraw and Biesecker, 2014; Manlove, Walker, Craft, et al., 2016). For example, medical racism and apartheid continue worldwide and are regularly separated from political policy (Washington, 2006; Roberts, 2011; Mendez, Scott, Adoadji, et al., 2021; Yearby, 2021; Sirleaf, 2022; Barhoush and Amon, 2023). With medical racism, systemic racism is the overlying issue that is overlooked or dismissed (Mendez et al., 2021; Roberts, 2011; Yearby, 2021). Lack of education and harmful policies around biology and gender continues to put queer and trans people at physical risk, both institutionally and interpersonally (Dennis, 2019; Carless, 2023; Mandler, 2024). Inhumane working conditions, lack of paid medical leave, and institutionalized forced labor through prisons are impacting working bodies all over the world (Anbesse, Hanlon, Alem, et al., 2009; Peipins, Soman, Berkowitz, et al., 2012; Berkman, Kawachi and Glymour, 2014; Nandi, Jahagirdar, Dimitris, et al., 2018; Blackett and Duquesnoy, 2020). We are held back by our disciplinary boundaries. This special issue works to bridge that divide.

Papers in this volume remind us that both positive and negative experiences are embodied, though in biology we tend to focus on the effects of marginalization. The negative impacts of oppression are continually studied, while the privileges of having power, access, and resources are left undiscussed. Generally people who are marginalized don't need a quantitative mark to tell them they have embodied stress; it is more novel, and arguably more useful, to point

out the benefits of privilege, rather than continue with “damage-centered research” (Tuck, 2009). This special issue considers how we can shape our work differently to understand human plasticity with more nuance.

Drawing from feminist science studies, we bring together researchers from diverse personal and disciplinary backgrounds to create a space for more holistic discussions (Haraway, 1988; Harding, 1995; Roy, 2008; Weasel, 2016). This special issue includes scientists from different disciplines, backgrounds, and cultures who all bring in unique perspectives on embodiment. Each of the papers included in this issue uses a different lens to understand embodiment theory. Yet we see resonances in the ways these scholars discuss how lived experiences impact the body theoretically, in the skeleton, and through gene expression. All these papers take interdisciplinary approaches to understanding and operationalizing embodiment.

Sana Saboowala and colleagues suggest broadening our understanding of embodiment and encouraging alternative approaches to problem-solving. Their synthesis and examples highlight problems that continue to exist in the field. The critiques of the use of embodiment in epigenetic work echoes the calls of other researchers to expand beyond unidirectional thinking and prompts readers to think about embodiment as a multidirectional process. Saboowala and colleagues point out that we cannot just focus on negative embodiment; instead, we need to study how privilege, power, and positive traits are also embodied.

Valerie Sgheiza’s paper echoes this call; emphasizing the importance of considering positive as well as negative embodiment and demonstrating how the embodiment approach is necessary to study a variety of positionalities. In this excellent melding of genetic and skeletal, molecular mechanisms of embodiment in dentition are presented along with physical evidence from dentition. Here Sgheiza presents biological embodiment as the manifestation of life experiences through individual biology.

Jan Dahrendorff and colleagues provide an example of how embodiment can be incorporated into biological systems through genomic mechanisms. This paper explores the embodiment of trauma through the study of gene expression, a more recent approach to measuring embodiment. This research highlights the importance of studying trauma in community populations, as PTSD is not combat-specific. This type of project allows us to think in a more intersectional way about embodiment and the variety of lived experiences that can be

involved in this process.

Meredith Wilson’s exploration of embodiment, plasticity, and Western binarized sex/gender takes a feminist science and technology studies approach to understanding maintenance of harmful systems. Plasticity, often seen as the panacea to determinism, can serve as a tool to maintain racist, patriarchal cis- and hetero-normative structure. This cross-disciplinary approach, drawing from feminist, trans, and queer theory, reflects the ways in which holistic approaches to embodiment can provide us with new ways of looking at issues we continue to grapple with as a field. Wilson states that the goal is not necessarily to provide the “right” answer, but to give us new ways of tackling problems.

The articles included in this special issue highlight a need to expand definitions of embodiment to provide a more holistic picture of biological integration. Through cross-field collaborations, disciplinary silos can be broken down, and new approaches can be formulated. Cooperative action can connect disparate areas of study and influence and produce change that can target embodiment at the source.

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