

# She Blinded Me with Science

## Post-Curriculum and the New Scientific Education

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**I**N THIS ARTICLE, WE RE-EXAMINE THE HISTORY OF CURRICULUM STUDIES based on its relationship with the role of science. We are not concerned with science education *per se* but what Rasoul Nejadmehr (2020) calls “scientific education,” or the elements of a science of education, specifically as it relates to curriculum. In the now classic text, Kliebard’s (1986/2004) *The Struggle for the American Curriculum* occupies a privileged place in the field of curriculum studies. Kliebard presents four strong “currents” (as opposed to pendulum swings) in the stream of curriculum scholarship: humanism, child developmentalism, social meliorism, and social efficiency (p. 208). Kliebard characterizes the four frames and their proponents as struggling with each other to become the guiding norm that drives school practice. Likewise captured by Kuhn’s (1970) study of paradigms, they compete for the status of normal science in curriculum studies, against which all other perspectives are measured. Now part of the nomenclature in the academy, paradigms are more than perspectives that scholars happen to accept or reject. Paradigms exert pressure, in the cognitive and political sense, as we attempt to make sense of social phenomena. They provide a schema through which certain patterns are discerned or, just as important, are rendered invisible because they do not fit the normal case. More profoundly, many scientists—now including social scientists and curriculum scholars—do not merely position themselves *against* the dominant paradigm but labor to replace it by crafting *the new paradigm*. Kliebard (1992) provides one of the most useful histories of curriculum thought that contemporary curriculum scholars may leverage. But he does not focus on the role and evolution of science in what he calls the *Forging of the American Curriculum*. We argue that the central role of science mediates the otherwise complete and almost timeless feel of *The Struggle*.

The period of classical curriculum studies marks its beginning as a subdiscipline. Arguably born from the first book that bears the name in its title, Bobbitt’s (1918) *The Curriculum*, curriculum studies touched the academic enterprise from psychology to philosophy, the humanities to social sciences. Nowhere is science’s influence more felt than the formalization of curriculum studies as a bona fide specialization. As a discourse in Foucault’s (1972) sense, from the mid-1950s on, curriculum studies developed a specialized language and a scientific form of

intelligibility that eventually dominated the field. But by the late 1970s and early 80s, a science of curriculum gave way to the cultural politics of knowledge. In other words, curriculum scholars shifted the attention away from the role of science as arbiter of truth toward the politics of truth, as science became a target of ideology critique.

We pivot towards what we describe as “post-curriculum” scholarship or a radical questioning about the guarantees of a science of curriculum. Here, we present an interpretation of the “post” in general post-theorizing as a place of ambivalence rather than a temporal indication of an “after” or sense of disinvestment in science. Finally, our turn to “new science” is not a rejection of scientific thought and method *per se* as much as it asserts the skepticism central to the scientific endeavor itself. We speculate what post-curriculum thought and the new science have to offer education, curriculum thought specifically, in a time of radical upheaval in the United States and across the globe.

### **An Abbreviated History of Curriculum Studies: From the Science of Curriculum to the Cultural Politics of Knowledge**

By the time that Dewey’s academic life and long and illustrious career were nearing their end, the curriculum field was well established. Its debt to Dewey (e.g., see 1916, 1938) and the early curriculum scholars cannot be overstated. Born was a new specialization in education traceable to Latin origins meaning “racecourse,” as curriculum sprinted to the front of the discipline to take notice. It was led by scholars who were in touch with practitioners and school districts, thinkers and doers at the same time (Pinar, 1981). As curriculum scholarship matured, its community of intellectuals became organized as an academic force. Several generations of curriculum thinkers had gone through the educational pipeline and followed their mentors’ teachings, traditions, victories, and defeats. Curriculum became a science, and a Copernican revolution of sorts put the heavens in order.

A new cadre of names and set of discourses spread over the field, central to which was the continuing role of science in curriculum studies. Schwab, Popham, Beauchamp, and Tyler, to name a few, would replace the giants of Dewey, Counts, Harris, and Bobbitt. The city of Chicago was proudly home to two prominent Phil Jacksons, one at the University, the other an eventual coach of Michael Jordan. Although we do not want to overstate the complete dominance of science in the advancement of curriculum thought, such that curriculum as dramaturgical (Schwab, 1981) or artistic (Eisner, 2005) competed for paradigmatic status, the hold of scientific discourse over curriculum became formidable. Mainly cognitive and empiricist in orientation, the heyday of curriculum scholarship became fertile ground for new scientific distinctions and terminologies, as “vocabulary is still one of the chief problems in curriculum theory” (Johnson, 1981, p. 71). For example, Jackson’s (1968/1994) helpful concept of the “hidden curriculum,” or information often invisible or unintentionally taught and values implicitly endorsed, gave rise to other concepts like the “null,” “void,” or “enacted” curriculum. We could say that the overt curriculum is the medium, and the hidden curriculum is the message. At the structural level, Macdonald (as cited by Johnson, 1981) asserts that a scientific study of the curriculum does not involve studying people (p. 72), just as Saussure (1983) once claimed that a scientific appreciation of language is to understand it independent of humans. In other words, a systematic knowledge of curriculum apprehends its structure as an object of study. If this is correct, then scholars understand what a curriculum is rather than what it should be, what it consists of rather than what it does or accomplishes. The

latter belongs, properly speaking, to instruction when curricular content crosses the threshold to teaching.

In the search for a science of curriculum, the Tyler Rationale was one of the most successful translations of curriculum scholarship for the world of practice. Ralph Tyler (1969) published a short manual for understanding curriculum as made up of four constitutive parts: objectives, learning experiences, organization of said experiences, and evaluation. Deceptively simple, the Tyler Rationale influenced an entire generation of scholars and practitioners, whose echoes are still heard today. Its language was at once concerned with a conception and practice of curriculum—the first a theoretical apparatus for practice, the second a practical form of theory. At least through the 1960s and into the 70s, the influence of curriculum scholars was felt at the center of the discipline of education, with science leading as the dominant frame through which scholars enter the conversation. Graduate schools of education would have been remiss to neglect having a curriculum scholar grace their roster.

But an intellectual storm was brewing, and curriculum scholarship was caught without an umbrella. Asking what a “critical rationale” might look like, the new Left was developing, influenced by Marxist studies, Cultural Studies, postmodernism, anti-foundationalism, and anti-racism and feminism. Dewey was slowly being eclipsed by Derrida and Du Bois. By the mid 1970s and surely by the 1980s, the intellectual landscape had experienced profound shifts, including curriculum studies. One of the targets of critique was the status of science. From early to mid 20<sup>th</sup> century, the role of science in curricular thought provided a coherence even among intellectual adversaries and animators. Despite the fierce debates between the Reconstructionists and Progressives at the turn of the century and the parsing of curricular definitions by Eisner (1996) and Jackson (1968/1994), it would have been considered heretical to question radically the function of science and *still remain at the center of the curricular stage*. But with the rising influence of the Frankfurt School’s analysis of science as a form of instrumental ideology (see Horkheimer and Adorno, 1976), feminist and anti-racist critiques of eugenics and standard androcentrism in science (Martin, 1992; Stepan, 1990), and the arrival of Foucauldian (1980) studies of science as a “regime of truth” (p. 132), curriculum scholarship records a similar period of radical questioning regarding the scientific enterprise. Turning away from a science of the curriculum and toward the political economy of knowledge (Huebner, 1981), a new appreciation for theories of ideology (Apple, 1979/2019), cultural politics of subjectivity (Giroux, 1981), aesthetics (Pinar, 1998), *carrere* (Pinar, 1975), and biography (Grumet, 1988), curriculum reconceptualization cast a skeptical, if not also critical, eye on “traditional” curriculum scholarship and its unstated fetishization of science. In this new and “critical” generation, some preferred Marx’s Hegelianism over Dewey’s; instead of Frederick Taylor (1911) and Fordism, some sided with the Canadian social theorist, Charles Taylor, while others found purchase in Gramsci’s (1971) outline of a post-Fordist economy; and without objecting outright the Tyler Rationale, some wondered what a critical rationale might look like. This does not suggest that these new scholars were anti-science as much as they were embracing anti-scientism—less a rejection of scientific practice than an unveiling of its ideological excesses and fetishes, the influence of Althusser’s (1971) scientific Marxism notwithstanding. Finally, it would be fair to characterize the curriculum scholars of the new Left as having as wide a difference among them as the preceding generation. The turn away from science in curriculum studies by the 1980s was a turn toward cultural politics. Curriculum had become more than a collection of works—the “stuff”—and the teaching approaches accompanying them. It was, as Giroux (1983) argued elegantly, an introduction to a particular way of life.

Curriculum setting had become a vision of a possible society, a utopia, in one sense, or a segregation of bodies, including bodies of knowledge, in another sense. Scientific thinking was no longer seen as the objective march of more accurate knowledge away from provincialism without proper accounting for its role in empire (Nejadmehr, 2020). Like curriculum, science came to be understood not only as a cognitive or epistemological enterprise but, like other ideologies, able to construct, or better yet invent, the “human.” This did not equate scientific knowledge with other ideologies, like religion, but acknowledged that science builds an instrumental worldview that produces concomitant consequences, not the least of which is the cut within the category of human with European whites on the scientific human side and African blacks derogated to the zone of non-being (Fanon, 1952/2008; see also Wynter, 2001). In the U.S., Eurocentric curriculum came under intense questioning in the “culture wars” by the multiculturalist Left led by James Banks (1994/2002), Sonia Nieto (1991/2003), Geneva Gay (2000), and Carl Grant (2014) well past the 1990s. In addition, a science of curriculum that has little appreciation for education’s share in the reproduction of the conditions of production was deemed to be at risk of turning Johnny into a technical learner (of reading, writing, and arithmetic) while neglecting his social conditions. Finally, a science of curriculum that fails to notice who cleans up after the scientists had been framed as one that would reproduce patriarchy and a weak form of objectivity that hopelessly represents a partial and segregated truth (see Harding, 1991).

The turn toward critical curriculum studies marked a new theoretical relationship between scholars, the knowledge they produce, and the sociality they encourage. In an abridged representation of Mauritz Johnson’s (1981) schema of the curriculum (see Appendix A), there is a clear attempt to scientize or mathematize curricular understanding. One might consider Johnson’s uncovered exclusion of “indigenous cultural content” as a precursor to the curricular movement of “inclusion as enclosure in Native culture-based education” (Richardson, 2011, p. 332). Although Johnson’s model may not represent other traditional forms of curriculum scholarship or his contemporaries, it is instructive because it exposes a tendency, a *style*, as Nejadmehr (2020) might suggest, which runs through the intellectual edifice of the subdiscipline’s center and now comes under scrutiny.

### **Decolonizing the (Kantian) Curriculum: From *Enlightenment* to *Endarkenment***

Rasoul Nejadmehr’s (2020) critical engagement of Kantianism in modern education is decisive in our understanding of scientific education’s role in curriculum scholarship. In *Kantian Genesis of the Problem of Scientific Education* (2020), preceded by *Education, Science and Truth* (2009), Nejadmehr performs a critical genealogy of scientific education as inaugurated by Kant and thereafter sustained by mainstream educational scholars, including those studying curriculum. Systematized by Kant, scientific education was the problematic reduction of knowledge to Western notions of rationality that disparaged non-Western ways of knowing as already irrational. This Western style is captured by Nejadmehr’s (2020) interrogation of scientific education as such:

Science education refers to daily school practices such as lessons, examinations and assessments. These practices occur against a background that assigns them meaning and marks them as educational, a general orientation that leads them in the same direction and a foundation that makes them possible. Scientific education signifies this constitutive background, this orientation and foundation of educational practices and procedures. It is

about unarticulated values, norms, discourses and educational presumptions that are taken for granted as well as the educational apparatus that puts them into action beyond school boundaries. Although this layer of education is extremely important for education, it works invisibly; it signifies something of which educators can become aware rather than something of which they always are aware. ... In this sense, scientific education is a genealogical and descriptive notion. (p. 1)

Nejadmehr goes at length to describe Western scientific education, specifically Kantianism, as a certain system of thought that is taken for granted as the tape that measures human worth, without which other traditions and people are not taken seriously or are regarded simply as illegible. What became a Kantian revolution in knowledge and consequently asserted as universal, transformed into common sense—in a manner that is hidden but constitutive—for curriculum scholars from Dewey on.

Once established, the problem is less Kant than a Kantianism that rarely has to be articulated but is almost always assumed as part of normal science in curriculum thought. Deserving to be quoted at length, Nejadmehr (2020) explains,

Kantianism is not necessarily limited to what Kant has said, written and done; rather, it goes far beyond it, and though it may remain related and faithful to Kant's style of thought and the kind of views he withheld, it encompasses the way in which his heirs as well as his opponents carried on his ideas and the implications of Kant's ideas for the world after him. In this regard Kant's ideas are prototypes or proto-ideas, as Ludwik Fleck (1979) would say, embryonic and undeveloped versions of their posterity. This is to say that Kant inaugurated a tradition that lasted beyond himself [and] greater than Kantianism. Thus, in dealing with the genesis of scientific education in Kant, we have to do with issues such as Kant's point of departure in laying a ground for scientific education, the way he carried it out, the originality of this foundation and how this foundation endured and become the tacit intellectual infrastructure of current education. My concern is neither Kant nor Kantianism as such; I use both to understand the actuality of education in our time. (p. 5)

For Nejadmehr, the project of what we, here, call “post-curriculum” entails not so much a rejection of Kant/ianism as much as decolonizing its Eurocentric excesses, of provoking another revolution of knowledge through anti-racist science by joining Dillard's (2000) call for an “endarkened feminist epistemology” (see also, Wright, 2003; Hurtado, 2003). By saying this, replacing *Enlightenment* with *Endarkenment* is not dependent on an essential racial subject but a racial project, a curriculum agenda centering the history of knowledge from the unique perspective and historical experience of racio-colonial communities. This is tantamount to suggesting, with Frantz Fanon (1952/2008) and his interlocutor and critic Sylvia Wynter (1987), that Enlightenment or humanism is not the property of Europeans, henceforth, deposed by a certain humanism of the other, or Endarkenment. Wynter (1987) writes,

For our proposed new objects of knowledge to be receivable, we accordingly need to go beyond the ontology of the figure of man and the empowering normalizing discourses with which this “figure,” as the projected model/criterion of being of the globally dominant Western-European bourgeoisie, is still enchantedly constituted-now dangerously, in the context of our post-atomic environment. (p. 208)

The figure of European summer is here exchanged for black winter's enchanted subject. This move inaugurates a more human/e universalism replacing the Kantianism that has underwritten curriculum scholarship's history, toward a new science of the human. It is insufficient simply to reject Kantianism but requires engaging Kant's ideas in light of their consequences for modern education. Nejadmehr's (2020) intervention is more profound than an exercise in refutation because

given Kant's systematic manner and style of thought, a line-by-line reading of him is anti-Kantian, a misreading of him and limited in scope. It is a micro-perspective and misses the overall picture. My strategy is to read Kant organically, as Kant himself invites us to do. (p. 13)

We join Nejadmehr in reading Kant against his own philosophical excesses.

Highlighting this racio-colonial difference, compare Johnson's (1981) schema with Beyer and Apple's (1988) list of questions (see Appendix B) that curriculum scholars from the 1980s and on ought to take up. Even absent a nuanced content analysis, the radical difference between Johnson's (1981) and Beyer and Apple's (1988) priorities is obvious and palpable. Favoring technique, Johnson turns curriculum into an object of study in the literal sense. It is objectified, surveyed, and reduced to defining characteristics typical of a traditional and cognitivist science of the curriculum. In contrast to Johnson's binary between "disciplinary" vs. "non-disciplinary" knowledge, Beyer and Apple recruit an interdisciplinary approach that zooms out before it can dive into the heart of curriculum matters. It demands a reckoning with social conditions, power, and subjective agency. It is comparable to the shift from the rhetoric of effects, which is positivist and hierarchical, to the rhetoric of cultural production as described by Gaztambide-Fernández (2013) in the context of arts in education (p. 211). Furthermore, new curriculum studies (called Reconceptualism elsewhere) is not anti-science as much as it asks science to serve the social good through education. And while Beyer and Apple may call on science, they do not fetishize it. Along with the new Left, we may argue that a new scientific education emerges, which is the topic of the next section. Having thus introduced our problematic, we sketch the outlines of a decolonized science of curriculum.

### **Bringing Curriculum Studies into the *Post* with a Pluralistic New Science**

In the history of curriculum studies, one could observe how the systematization of scientific management is expressed as a fetishized, absolute science. Meanwhile, the sciences diverge and evolve independently from the absolute science crystallized in early 20th century U.S. curriculum theory. The history of science and science philosophy, along with Science Technology Studies and the social studies of science, have the potential to shape the "world of sciences" today (Harding, 2011, p. 9). Here, we focus on the anti-traditionalism that was and still is a part of the sciences. Iterative paradigm shifts make up the history and future in our conception of a new science, which provide an impetus for a comparable movement in the history and future of curriculum theory. The transdisciplinary critique of absolute science generates a new science, which converges in the curriculum field at a place of ambivalence: post-curriculum.

Note that "post" is a theoretical marking that is spatial, not only temporal. Although "post" is often used as a prefix to imply something temporal, the term used here has deeper etymological

roots that are spatial (for more on “post,” see Leonardo, 2010, 2013, 2020). Post can be a marker or pole used to indicate a starting or finishing point of a horse race, forming a parallel with the etymology of “curriculum,” or racecourse. Public notices are adhered (or “posted”) to a post. In the early 21st century, the term “post” endures for messages delivered by the postal service and by electronic message boards on social media platforms where we post announcements. The spatial and communicative elements of “post” reiterate that our claim is not that curriculum studies is necessarily “moribund” (Schwab, 1969/2013). Rather than being *in the past*, curriculum studies is *in the post*.

To conceptualize a new science, we first consider a cultural representation of traditional, absolute science. “She Blinded me with Science” is the title of Thomas Dolby’s one-hit wonder of the 1980s. As Agosto et al. (2019) problematize the use of deficit-laden terms in academic literature, one may challenge the deficit-paradigm implied by the song title: “A critique that tears at the limits of the paradigms that threaten to [“blind”] bind us, we hope to spur work(s) and study/studies that ... welcome dis/orderly and dis/orienting reflection.” (p. 37). Dis-orienting reflection will involve being critical, indeed self-critical, to evade the trap of the convenience of re-producing Western regimes of thought. One may re-locate the Western regimes of scientific education of curriculum theory precisely by locating them in a broader discourse of post-curriculum. We focus our self-critical concern of scientific education in a pluralistic new science, or “world of sciences” (Harding, 2011, p. 9), in subsequent sections.

An ideal scientific process is iteratively self-skeptical and self-correcting. To be “blinded” by science may elevate science to the status of absolute truth, inferring that human-constructed knowledge may exist outside social worlds. While focusing on how to make the curriculum more scientific, traditional curricularists may have lost sight of how the practice of science is thoroughly social. Using Nejadmehr’s (2009, 2020) conception of “scientific education,” the next section uncovers how science was crystallized in curriculum studies.

### Scientific Education

Nejadmehr (2009, 2020) offers the distinction between scientific education and science education. Science education is disciplinary and content-focused, whereas scientific education is the conception of distinct subject areas, all of which could be taught scientifically or not, and “signified by the rational systematisation of knowledge and schematised and routinised methods of learning” (Nejadmehr, 2009, p. 27). Efficiency is key, or as Jean-François Lyotard (1984) describes it, high *performativity* with a low input to high output ratio. In schools, this may amount to fewer teachers and more students or one standardized test and more scores in order to sort and track students more efficiently.

Scientific education pervades all subjects across curriculum history. With the conception, uptake, and domination of a scientific worldview or instrumental ideology, the social construction of reality by religions and myths was “forced to cope” (Berger & Luckmann, 1966/1967, p. 106). During the European Enlightenment, people developing early theories of science opposed religious authority with “ecclesiastical scholasticism” (Nejadmehr, 2009, p. 32). However, as an affront to faith-based knowledge, the historical roots of science do not prevent scientific education from dominating in a comparable, authoritative fashion. It would be too much to call science the new religion, for this would conflate faith with empiricism, two radically different ways of constructing the world. That said, during the Enlightenment, science was slowly replacing religion as the

dominant worldview about origin, meaning, and truth. The expectation of scientific education is, as Nejadmehr (2009) describes, “based on the article of faith that there is a single world ... an absolute reality that is one and the same for all” (p. 34). This conception of scientific education as an absolute reality appears to be crystallized – permanently fixed – in the foundations of U.S. curriculum theory.

Once adapted for curriculum theory, scientific education elevates the status of “experts.” With the elevation of the expert, “The ‘lay’ member of society no longer knows how his universe is to be conceptually maintained, although, of course, he still knows who the specialists of universe-maintenance are presumed to be” (Berger & Luckmann, 1966/1967, p. 130). The study of the social construction of knowledge deems scientific knowledge and its constructors (or charlatans) as more credible than faith-based, local, or “lay” knowledge (Berger & Luckmann, 1966/1967, p. 135). However, throughout the “whitestream” history of settler colonialism, there are examples of how white settlers claim and exploit knowledge of “the other” and, subsequently, how Indigenous knowledge is repurposed as multiculturalism in curriculum studies (Tuck & Gaztambide-Fernández, 2013, p. 82). Consider the scientific experts at the genesis of U.S. curriculum studies, set in the historical context of eugenics. People regarded as scientists at the time used measurable phenotypic characteristics to justify racist ideology. Efficiencyists harnessed the self-proclaimed prowess of scientific quantification and applied it to measure intelligence: “‘Science’ became the rhetorical, though often unconscious, cloak to cover conservative social and educational decisions ... . Bobbitt and others increasingly codified their arguments in scientific terms” (Apple, 1979/2019, p. 75). As arguments for social efficiency became codified in scientific rhetoric, social control became justified and associated with the language of science, ultimately promoting a nature-based and deterministic view of learning. Of course, these assumptions of what science seemed to offer curriculum studies concealed what was guaranteed: the self-preservation of an absolute science, sourced from white settlers of European-*Enlightenment* descent as “experts.”

Consequently, the “experts” upholding racist ideologies maintained the status quo by sorting people based on the meaning ascribed to “measurable” human differences. Remnants of this science adopted by efficiencyists persist today in the form of standardized testing, which implicitly assumes that measured intelligence can be used to track students and which disproportionately impacts students of color (Oakes, 2005). It would be inappropriate to measure children’s skulls today, so the eugenics of the past is translated to the testocracy of today. This testosterone-infused science is now under intense scrutiny as colleges and universities question the predictive utility of the SAT, GRE, and other entrance exams.

Absolute science was the soil in which scientific education germinated. Apple (1979/2019) specified that “educators have borrowed only the language, often on the surface language and have, hence, pulled the terminology out of its self-correcting context” (p. 116). As curriculum studies became scientized, it became self-legitimized as objective, and yet this absolute science was devoid of the critique of science. As curriculum studies developed into a recognized subdiscipline, the sciences evolved in parallel with their own self-correcting processes, independent from scientific curriculum studies. The dialectical relationship is severed when the concept of “science” is integrated into curriculum studies. It diverges from the evolving social reality of scientific practice. Epistemological absolutism came to dominate curricular thought.

Academic expectations for scientific education reinforce the assimilation of curricularists to the performance of scientific supremacy. The science to which they aspire is based on an illusion: “Curriculum workers’ ties to a sought-after reference group—here, the scientific



community, and ... a misperceived scientific community at that” (Apple, 1979/2019, p. 119). In aspiring to be scientific, traditional curricularists pursued absolute knowledge detached from the messiness of human affairs, or at worst a dehumanizing absolute knowledge. Dehumanization, or the separation between humans and their participation in the construction of knowledge, culminates in what Nejadmehr (2009, 2020) describes as relations of alienation or estrangement (pp. 36–37 & pp. 183–184, respectively).

As an alternative to the dehumanized and “unquestionable ground of knowledge” protected by absolutism (Nejadmehr, 2009, p. 17), rehumanization makes human participation in the production of knowledge explicit. Curriculum theory is rehumanized through social critique. The claims for truth made with the “technocratic model of curriculum” resulted in “truncated forms of inquiry” that disregarded other forms of knowledge production (Giroux, 1981, p. 100). By valorizing the scientific approach, the technocratic model of curriculum neglected the differing and, at times, contradictory perspectives within the scientific community itself (Giroux, 1981, p. 102). Curriculum Reconceptualists, like Giroux, critiqued the reified absolute science of scientific education. Meanwhile, the philosophy and sociology of science offered a self-correcting context for the world of sciences. At the turn of the 20<sup>th</sup> century, W. E. B. Du Bois (as cited by Morris, 2015) “believed that scientific knowledge could help liberate blacks in America” (p. 21). Decades later, along with the emergence of the politics of curriculum, science philosopher and historian Thomas Kuhn (1970) identified patterns in the development, acceptance, and refutation of scientific knowledge, and sociologist Robert K. Merton (1973) described norms of the scientific community. Sandra Harding (1991) and Dorothy Smith (1987) offered a feminist critique of science. Anne Fausto-Sterling (2012) deconstructs how gender and sexuality are understood in biological and medical contexts, and scientists themselves have quantified sex bias in research (Beery & Zucker, 2011) and advocated for the economic benefits of sex inclusion in basic research (Klein et al., 2015). Postcolonial critique of science and technology (Harding, 2011) has taken place along with critics of orientalism, such as Edward Said (1979) and Laura Nader (2014, 2015). Race reification in science has been investigated in genetics by Troy Duster (2005) and in physics by Chanda Prescod-Weinstein (2020). Countless other social scientists and philosophers have contributed to unmasking scientists as subjective human agents, as faces hidden behind the authority of scientific expertise. Nejadmehr (2020) describes the value of “Western self-criticism” (p. 146) of the Kantian genesis of scientific education. The aforementioned philosophers, sociologists, and scientists also critique science from the vantage point of the Western tradition as a form of self-correction.

Another option Nejadmehr (2020) describes is “criticism from an external perspective” (p. 154). By inviting intellectual contributions from all parts of the world using frameworks developed outside the Kantian paradigm of Western Enlightenment, such as decolonial and subaltern methods, educators could develop “a new global state of mind” (Nejadmehr, 2020, p. 162). A world of sciences can provincialize, or place into its historical context (Chakrabarty, 2008), the European absolute science embedded in U.S. curriculum theory. By doing so, we locate it within the particular history that interpellates it against its absolutist ambitions. Beyer and Apple (1988) ask questions, discussed in the previous section of this article, that rehumanize and historicize the absolute science informing curriculum studies. However, once the questions are asked, can established curricularists embedded in white settler colonialism listen to the criticism from an external perspective? Tuck and Gaztambide-Fernández (2013) describe “Browning” as “a move that deliberately seeks to uncover and highlight the myriad of complicated ways in which white supremacy and colonization constantly manifest themselves in curriculum scholarship” (p. 83) and

is “anti-paradigmatic to curriculum studies” (p. 84), providing an example of how white affect was (and is) implemented to dis/engage with “Indigenous, queer, critical race, and post-, anti-, and decolonial perspectives” (p. 84). In a way, it seems that relativism could be used either to challenge or maintain the status quo in curriculum studies.

What are alternatives to absolutism and relativism in curriculum studies, education, and knowledge? A tension exists between the local, context-dependent nature of education and the proclaimed universality of absolute truth efficiently embedded in U.S. curriculum scholarship. Critiques of perpetual relativism, without alternatives, foreclose the possibility of a pluralistic world of sciences. Because the social constructivism of science was wielded as a means of challenging scientific authority, unintended consequences leave Bruno Latour critiquing such critique itself. In an interview, Latour argues, “We will have to regain some of the authority of science. That is the complete opposite from where we started doing science studies. But the solution is the same: You need to present science as science in action” (de Vrieze, 2017, para. 14). In our attempt to rehabilitate the science of curriculum, our caveat is that it is questionable that a dialectical return to the “authority of science” can or should be accomplished. Considering scientific education as a form of absolutism and the caricature of the Reconceptualists of curriculum as relativists, one may find both of these approaches to be dead ends, for “absolutism demands consensus and assimilation of all perspectives into a single one and relativism disperses humanity into scattered paradigms incapable of communicating and agreeing on things” (Nejadmehr, 2009, p. 21). Our challenge is to explore an alternative social re-construction of science as a new science and to reconcile universalist and relativist curriculum theories in our conception of post-curriculum.

### **Prerequisites for Post-curriculum and the New Scientific Education**

Post-curriculum is a reclamation of place and communication as prerequisites for multi-disciplinary and cross-cultural connection for ongoing issues in curriculum studies. It recognizes the travelers in the field of curriculum studies as wearing “a set of spectacles that allow certain parts of the field to be seen more or less than others, always depending on the vantage point from which one looks” (Gaztambide-Fernández, 2009, p. 237). Furthermore, post-curriculum can serve as a complementary alternative to standpoint epistemology. As described by Harding (2011), standpoint epistemology is a

geographical metaphor [that] directs attention to a location, a site in social relations, from which a disadvantaged group learns to observe and speak for itself and to the advantaged group about how unjust and oppressive social relations affect their lives. (p. 19)

Instead of merely being a perspective, standpoints are “intellectual and political achievements in that a group has to work together to figure out how to arrive at them,” and these achievements come with a synthesis of a “scientific study of everyday life” and “political struggles to gain access to sites” (e.g., boardrooms, policy circles, etc.) (Harding, 2011, p. 19).

Once we have gathered at post-curriculum, a meeting point, how can we broach the topic of scientific education in curricular discourse? The trap of convenience and the promise of scientific education may limit our creative collective consciousness to alternatives. To escape this trap, let us imagine a new science, encompassing a world of sciences in an on-going inquiry of

“*What’s next?*” Within a post-curricular formation, we do not uphold science as a bearer of truth and marginalize other sources of knowledge. Consider empiricism at the level of the individual, as offered by Berger and Luckmann (1966/1967): “The validity of my knowledge of everyday life is taken for granted by myself and by others until further notice, that is, until a problem arises that cannot be solved in terms of it” (p. 58). “My” knowledge may or may not align with scientific knowledge, and yet both function as truth and both are subject to modification. It is incumbent upon the individuals to self-reflect on their knowledge and to seek to understand perspectives that are different from their own, without falling to relativism and in a contrapuntal relationship with knowledge, as Said (2004) would argue. Likewise, Nejadmehr (2009) describes “a strong notion of the individual,” who can, “look at one’s own perspective through the prism of others,” “possess a rigorous form of argumentation,” and “resist manipulative powers of collectives and states” (p. 172). This is reminiscent of Harding’s (1991) insistence on a strong form of objectivity in science, which intentionally includes perspectives of marginalized groups for a broader objectivity and a larger slice of truth. A new science as proposed here would shift the focus from science as truth to individuals as the creators and modifiers of knowledge. One may wonder if a possible mechanism to fostering a strong notion of the individual, and their positionalities with/in culture, could be through multidimensional autobiography with *currere* (Pinar, 1975).

Although a new science validates knowledge as experience at the individual level until further notice, what about the authoritative aspect of science in institutions? To address this, let us consider new science as a dereified science. Dereification is described as a “collapse of institutional orders, the contact between previously segregated societies, and the important phenomenon of social marginality” (Berger & Luckmann, 1966/1967, p. 109). However, a “collapse of institutional orders” does not occur passively, especially when there are beneficiaries who are advantaged by keeping institutional orders as they are. For “a strong notion of the individual” to resist institutional orders imposed by science, the individual must be aware of the institutional orders and seek to understand their impact on marginalized people and perspectives. Nejadmehr (2009) suggests an “awareness of the real conditions of life” (p. 172) as well as “a strong culture” that “encourages marginalized perspectives to take an active part in the production and use of knowledge.” (p. 179). For societies with persisting racial, ethnic, and socio-economic strife, the oppressors’ “tolerance” of oppressed “others” can be seen as a patronizing move, what Paulo Freire (1968/1993) calls “false charity” (p. 27).

Therefore, dereifying science may require what Nejadmehr (2009) refers to as a “cognitive democracy,” which “establishes equality between different perspectives and maintains inclusion as a principal cognitive norm” (p.166). A cognitive democracy of strong individuals, self-reflecting and encouraging of a multitude of perspectives on institutional orders, fosters an equally strong culture that challenges the authoritative aspect of science and would serve to create an ever-changing new science. In subsequent work, Nejadmehr (2020) describes *homo polytropos* as one who may “view non-whites’ experiences as part of a new global intellectual alliance, where Western self-criticism is united with criticisms from the perspectives of oppressed people” (p. 187). He emphasizes the need to create a counter-education of counter-narratives to “rethink and delink whiteness from privileges” (p. 187). By including a diversity of perspectives as the basic premise of truth, and not limiting truth to the empiricism of institutionally-ordained experts, a new global intellectual alliance becomes an imperative to understanding our world.

## Challenges of Post-Curriculum and the New Scientific Education

The ideals of Harding's (2011) "world of sciences" (p. 9) or Nejadmehr's "cognitive democracy" (2009, p. 166) and "new global intellectual alliance" (2020, p. 187) are aspirational alternatives to the scientific education of traditional curricularists. However, a formidable status quo maintains the inequitable distribution of resources and educational access. For example, in the United States, with every step towards progress, a co-evolving force finds yet another way to avoid social responsibility and suppress transformation. When people who were enslaved were prohibited from and punished for learning to read, a fugitive pedagogy was established to create opportunities to learn. When the descendants of enslaved people experienced how their churches and schools as places of learning were vulnerable to white violence and destruction without retribution, the Black community established other ways and places to educate. When their descendants could only attend under-resourced and segregated schools under the guise of white benefactors, Black teachers would lecture from a, literally, hidden curriculum of Black-centered texts (Givens, 2021). When their descendants faced violent protests fueled by white supremacy in the wake of legal enforcement of racial desegregation of schools, Black students and teachers continued to advocate for an equitable distribution of resources and protection (Kluger, 1975). As their descendants continue to be disproportionately suspended from school and subjected to surveillance yet develop "organic capital" in response to criminalization (Rios, 2011, p. 102), the subsequent call for curriculum that explores the impacts of systemic racism is met, in some places, with vehement rejection. The patterns of white oppression and Black resistance perpetuate in ways that make social transformation at even the local level, let alone the ideal of a global intellectual alliance that decenters Western white supremacy, seem like a distant fantasy.

In addition to the Red Queen effect of oppression and resistance in education, another challenge to surmount in achieving a new global intellectual alliance is the issue of decolonizing the mind and decolonizing languages. Nejadmehr (2009) describes the value of cultural interactions informed by translational universalization, instead of imperial universalism that is shaped by Western domination. However, the nuances of language render the task of translation as easier said than done. For example, Ngũgĩ wa Thiong'o (1992) describes the process and challenge of African languages gaining recognition as a language of teaching and learning in the wake of decades of criminalization and erasure. Further, we must consider what it means to discover the realities of the world and who shapes and interprets new knowledge emerging from research. Decolonizing methodologies has focused on predominantly social sciences (Smith, 2012). Decolonizing science has its own complexities, as much of the language of Enlightenment science derives from European languages. In an article featuring Wanga Zembe-Mkabile, a scientist who grew up through the apartheid of South Africa, the author writes, "In Xhosa, Zembe-Mkabile's home language, there isn't even a word for research. The best approximation, she says, is *ukuphanda*, which has negative connotations. 'It means to search for a bad thing, like a police investigation,' she says" (Nordling, 2018, p. 160). These are just a couple of examples that highlight that the challenges of translational universalization in practice. If this is a prerequisite for a new global intellectual alliance, then serious consideration must be given to the value and need for decolonizing language planning as a prerequisite for a decolonized science of curriculum.

## Conclusion

As a community of practice, science cannot only be accountable to itself. Outsiders can and should dismantle the authoritative elements of European Enlightenment science to foster a global, cognitive democracy. A new science calls for actively centering different ways of knowing—non-Western, non-European, and non-white. A new science serves to deconstruct the absolute science, from the outside and inside, and overcome the historical subjection of curriculum studies to science. Expanded beyond the definitional boundaries of Western rationality, a new science can unveil aspects of our lived experiences and social realities that have historically been suppressed. Rather than a fixed universal paradigm, a new scientific education is an iterative process of translational universalization. It is highlighting subaltern methods (Nejadmehr, 2020) and “Browning” the curriculum (Tuck & Gaztambide-Fernández, 2013) in the age of Endarkenment (Wynter, 1987). Post-curriculum creates more than the Kantian conditions of possibility to resist, transgress, and transform education—it sets forth an ethical imperative to foster “a world of sciences” (Harding, 2011, p. 9), a “cognitive democracy” (Nejadmehr, 2009, p. 166), a “new global intellectual alliance” (Nejadmehr, 2020), and equitable co-authorship of post-curriculum studies.

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### Appendix A. From Johnson’s (1981) *Schema for Curriculum*

1. A curriculum is a structured series of intended learning outcomes.
  - Corollary: Curriculum does not consist of planned learning experiences.
  - Corollary: Curriculum is not a system but the output of one system and an input into another.
  - 1.1 Learning outcomes consist of three classes:
    - 1.11 Knowledge
      - 1.111 Facts: items of verifiable information.
      - 1.112 Concepts: mental constructs epitomizing facts about particular referents.
      - 1.113 Generalizations: (including laws, principles, rules) statements of relationship among two or more concepts.
    - 1.12 Techniques (processes, skills, abilities)
      - 1.121 Cognitive: methods of operating on knowledge intellectually
      - 1.122 Psychomotor: methods of manipulating the body and material things effectively with respect to purposes.
    - 1.13 Values (affects)
      - 1.131 Norms: societal prescriptions and preferences regarding belief and conduct.
      - 1.132 Predilections: individual preferential dispositions (attitudes interests, appreciations, aversions).
  - 1.2 Whenever a curriculum is used in instruction, the intention (to achieve the outcomes) is implicit regardless of the curriculum's origin or sanction. Selection is an essential aspect of curriculum formulation.
  - 2.1 The source from which curriculum is selected is the available culture.
    - Corollary: Societal problems and the needs and interests of children are not sources of curriculum.



- 2.11 Modern communication makes available cultural content that is not indigenous to the society in which the curriculum is formulated
- 2.12 Some indigenous cultural content may be unavailable due to the secrecy of those in possession of it.

(Johnson, 1981, page 80)

### **Appendix B. Beyer and Apple's (1988) List of Questions**

1. Epistemological: What should count as knowledge? As knowing? Should we take a behavioral position and one that divides knowledge and knowing into cognitive, affective, and psychomotor areas, or do we need a less reductive and more integrated picture of knowledge and the mind, one that stresses knowledge as process?
2. Political: Who shall control the selection and distribution of knowledge. Through what institutions?
3. Economic: How is the control of knowledge linked to the existing and distribution of power, goods, and services in society?
4. Ideological: What knowledge is of most worth? Whose knowledge is it?
5. Technical: How shall curricular knowledge be made accessible to students?
6. Aesthetics: How do we link the curriculum knowledge to the biography and personal meanings of the student? How do we act "artfully" as curriculum designers and teachers in doing this?
7. Ethics: How shall we treat others responsibly and justly in education? What ideas of moral conduct and community serve as the underpinnings of the ways students and teachers are treated?
8. Historical: What traditions in the field already exist to help us answer these questions? What other resources do we need to go further? (p. 5)

